BURNS McDONNELL

2020 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond

KANSAS CITY BPU
THE POWER OF COMMUNITY

Kansas City, Kansas Board of Public Utilities

Nearman Creek Power Station

Project No. 88777
02/5/2021

2020 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond

prepared for

Kansas City, Kansas Board of Public Utilities
Nearman Creek Power Station

Kansas City, Kansas

Project No. 88777

02/5/2021

prepared by

Burns & McDonnell
Kansas City, Missouri

TABLE OF CONTENTS

Page No.

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
2020 reduced list of Appendix IV parameters	Appendix IV parameters that were detected during the May 2020 sampling event
BA Pond	Bottom Ash Pond
BPU	Kansas City Board of Public Utilities
CCR	Coal Combustion Residuals
CCR Final Rule	*Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, dated April 17, 2015, amended July 30, 2018
Cell 1	Nearman Creek Power Station Bottom Ash Pond
CFR	Code of Federal Regulations
Groundwater Monitoring Program	*Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond*
GWPS	groundwater protection standard
KDHE	Kansas Department of Health and Environment
mg/L	milligrams per liter
NCPS	Nearman Creek Power Station
NTU	Nephelometric Turbidity Unit
ORP	oxidation-reduction potential
Report	Annual Groundwater Monitoring and Corrective Action Report
SAP	*Sampling and Analysis Plan for the Nearman Creek Power Station*
Site	Nearman Creek Power Station
SSI	statistically significant increase
USEPA	United States Environmental Protection Agency

1.0 EXECUTIVE SUMMARY

The Kansas City Board of Public Utilities (BPU) Nearman Creek Power Station (NCPS or Site) Bottom Ash Pond (BA Pond or Cell 1) surface impoundment consisted of a bottom ash pond and a clear water pond, which were historically used for storage of bottom ash and settling of solids, respectfully. Traditionally, the bottom ash was removed from the boiler via a sluice water transport system. The fines in the slurry settled out in the Bottom Ash Pond and the water flowed through a submerged pipe into a holding pond (clear-well) for storage and subsequent reuse in this closed-loop system. NCPS's bottom ash system was converted to a dry process in 2018. Bottom ash is now dry force-air conveyed via piping and stored in a bottom ash silo prior to off-site disposal/beneficial reuse. As per the United States Environmental Protection Agency's (USEPA's) *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, 40 Code of Federal Regulations (CFR) Part 257 and 261, dated April 17, 2015 and amended on July 30, 2018 and on September 28, 2020 (USEPA, 2015; USEPA, 2018; and USEPA, 2020) (CCR Final Rule), BPU is required to submit an Annual Groundwater Monitoring and Corrective Action Report. This document serves as the 2020 Annual Groundwater Monitoring and Corrective Action Report and is the fourth Annual Groundwater Monitoring and Corrective Action Report prepared for the Nearman Creek Power Station BA Pond in accordance with the CCR Final Rule.

In 2020, assessment monitoring was conducted at the BA Pond pursuant to 40 CFR 257.95. Per 40 CFR §257.94(e), BPU initiated the assessment monitoring program in March 2018 in response to the findings that select Appendix III parameters were identified at statistically significant concentrations above background limits that were calculated for the BA Pond. During the October 2020 groundwater sampling event, arsenic was detected at a statistically significant level greater than the groundwater protection standard (GWPS) at downgradient Monitoring Well MW-8A. BPU is currently assessing whether the elevated arsenic concentrations at Monitoring Well MW-8A are a result of a source other than the CCR unit in accordance with 40 CFR 257.95. This assessment will be completed by March 18, 2021, 90 days from December 18, 2020.

As a voluntary corrective action, BPU initiated a project to remove CCR from within the BA Pond for beneficial reuse in 2018. The last known volume of CCR removed for beneficial use occurred on February 12, 2020, which is also the date on which voluntary impoundment closure activities were initiated. On March 23, 2020, CCR removal activities were considered substantially complete. Over-excavation of the existing impoundment soil liner materials commenced on March 26, 2020. The

impoundment liner over-excavation activities were completed on June 23, 2020. The embankment berms of the BA Pond were razed and soil visually confirmed to be free of ash, was used to regrade the BA Pond in order to generally restore the natural stormwater drainage pattern toward the Missouri River per the *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a).

2.0 INTRODUCTION

This Report was prepared by Burns & McDonnell on behalf of BPU to present groundwater monitoring activities performed under the USEPA's *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, 40 Code of Federal Regulations (CFR) Part 257 and 261, dated April 17, 2015 and amended on July 30, 2018 and September 28, 2020 (USEPA, 2015; USEPA, 2018; and USEPA, 2020) at the BA Pond located at BPU's NCPS. This Report has been prepared to provide an account of groundwater monitoring activities performed in 2020 in support of BPU's compliance with the Final Rule. These activities were performed in general accordance with the *Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016a) (Groundwater Monitoring Program) and the *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016b) (SAP) and included the following:

- Statistical evaluation of groundwater data for samples collected from 2015 through 2020.
- Continued assessment monitoring program per 40 CFR 257.95.
- Establishing groundwater protection standards (GWPSs) for those Appendix IV parameters detected during the assessment monitoring program being implemented at the BA Pond.

2.1 Purpose and Scope

This Report has been prepared per 40 CFR 257.90(e) to document the status of the groundwater monitoring and corrective action program at the BA Pond, summarize key actions completed, describe any problems encountered, discuss any actions to resolve the problems, and provide key activities for the upcoming year. This document is the fourth annual Report for the BA Pond.

2.2 Overview

This Report is organized in sections as summarized below:

- **Section 1.0 Executive Summary**
- **Section 2.0 Introduction**
- **Section 3.0 Groundwater Monitoring Activities and Results –** Section 3.0 presents a narrative of the background, detection, and assessment monitoring activities that have been performed during the reporting period. Groundwater monitoring results are also included in this section.

- **Section 4.0 Statistical Analysis –** Section 4.0 discusses statistical analyses of data generated during the reporting period.
- **Section 5.0 Account of Voluntary Corrective Actions Completed** – Section 5.0 discusses remedial activities that took place at the BA Pond as a part of the voluntary corrective action program.
- **Section 6.0 Certifications and Notifications to the Operating Record –** Section 6.0 lists certifications and notifications that were prepared during the reporting period.
- **Section 7.0 Key Activities for the Upcoming Year** – Section 7.0 presents an account of anticipated activities for 2021.
- **Section 8.0 References** – Section 8.0 includes a full bibliography for references made within this report.

Figure 2-1 presents the location of the BA Pond relative to the NCPS. A description of the site setting is presented in Section 3.0 of the Groundwater Monitoring Program.

3.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS

3.1 Description of the Groundwater Monitoring Program

On January 1, 2020, the BA Pond was in assessment monitoring. Prior to 2020, a total of 9 detection monitoring events and 4 assessment monitoring events had been performed at the BA Pond. These events were reported on in the *2017 Annual Groundwater Monitoring and Corrective Action Study Report* (Burns & McDonnell, 2018a), the *2018 Annual Groundwater Monitoring and Corrective Action Study Report* (Burns & McDonnell, 2019a), and the *2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2020b).

In 2020, two groundwater monitoring events were conducted at the BA Pond as a part of assessment monitoring activities. The following bullets present a summary of the timing of each of the groundwater sampling events, presents the analytes that were sampled, and gives rationale for each sampling event. Sampling was performed in accordance with the Groundwater Monitoring Program.

- May 2020 – Groundwater samples were collected from all wells presented in Figure 3-1, including: Monitoring Wells MW-2A, MW-3, MW-4, MW-8A, MW-10, MW-13, MW-14, MW-15, and MW-16. Samples were analyzed for the complete list of Appendix III and Appendix IV parameters per the requirements of 40 CFR 257.95(b). The results of this sampling event were statistically evaluated and compared to background concentrations that were developed using the statistical methods included in the September 13, 2018 *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2018b). The results of this evaluation, which are summarized in the September 11, 2020 *Notification Regarding Groundwater Protection Standards* (Burns & McDonnell, 2020b), indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs.
- October 2020 – Monitoring Wells MW-2A, MW-3, MW-4, MW-8A, MW-10, MW-13, MW-14, MW-15, and MW-16 were sampled for the complete list of Appendix III parameters and those Appendix IV parameters that were detected during the May 2020 sampling event (herein after referred to as the "2020 reduced list of Appendix IV parameters", which includes: arsenic, barium, fluoride, lithium, molybdenum, selenium, radium). The results of this sampling event were statistically evaluated and compared to background concentrations that were developed using the statistical methods included in the September 13, 2018 *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities*

Nearman Creek Power Station Bottom Ash Pond (Burns & McDonnell, 2018b). The results of this statistical evaluation, which was completed on December 18, 2020, is summarized in Appendix A of this Report, indicated that arsenic detected in Monitoring Well MW-8A was greater than its respective GWPS. Arsenic was detected at a concentration of 0.0373 mg/L on October 19, 2020. A verification sample was collected on December 8, 2020 to assess an atypical oxidation-reduction potential (ORP) reading that was observed and an elevated arsenic result detected at Monitoring Well MW-8A during the October 2020 sampling event. The arsenic concentration detected during the verification event was 0.0352 mg/L. With the exception of arsenic, the statistical evaluation indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs. As described in Section 4.0, and in accordance with 40 CFR 257.96(g)(3), BPU is currently evaluating the arsenic detection at Monitoring Well MW-8A.

3.2 Groundwater Sampling Activities

During the 2020 sampling events identified in Section 3.1, the depth to groundwater was gauged during the May and October sampling events using a decontaminated water level meter. Measured water levels used to develop the piezometric surface contours presented on Figures 3-2 and 3-3. The measured depth to groundwater and calculated water level elevations for each event are presented on Tables 3-1 and 3-2. Prior to groundwater sample collection, the wells were purged using low-flow sampling pumps until stabilization criteria had been met and the turbidity was below 5 Nephelometric Turbidity Units (NTUs). Once groundwater stabilized, the BA Pond monitoring wells were sampled for the parameters presented in Section 3.1 using the analytical methods presented on Table 3-3. Samples were stored and transported in accordance with the SAP included in the Groundwater Monitoring Program and were shipped to Pace Analytical National Center for Testing & Innovation for analysis. No issues were encountered during the sampling events performed at the BA Pond in 2020. Monitoring well sampling forms for each of the groundwater monitoring events are presented in Appendix B. Analytical data are summarized in Table 3-3, copies of laboratory analytical data packages are included in Appendix C. Laboratory data was validated in accordance with the SAP and all data are considered suitable for reporting as qualified. Copies of data validation reports are provided in Appendix C. None of the detected parameters from the May sampling event exceeded their respective GWPS. However, as mentioned in Section 3.1, arsenic in Monitoring Well MW-8A was detected above its respective GWPS during the October 2020 sampling event. A summary of May and October 2020 sampling results are presented in Table 3-3.

As presented on Figure 3-2, the primary groundwater gradients observed during the May 2020 sampling event are to the south and east, toward the BA Pond. This is a departure from historical groundwater

monitoring events where groundwater gradients were observed to the northwest. The groundwater gradient observed at the BA Pond during the October 2020 sampling event was to the northwest, toward Monitoring Well MW-14. The predominant groundwater flow direction historically observed at the BA Pond is to the northwest toward Monitoring Well MW-14. However, periodic and temporary reversals in the groundwater flow direction, similar to the gradients observed in May 2020, have been observed . These temporary reversals have been attributed to fluctuating river stage.

4.0 STATISTICAL ANALYSIS

In accordance with 40 CFR 257.93(h)(2), statistical analysis of the groundwater water quality data collected from October 2015 through December 8, 2020 was completed on July 03, 2020 and December 18, 2020, within 90 days following analysis of the samples collected during the May 2020 and October 2020 sampling events, respectively. The results of these assessments were used to update GWPSs. As presented in Appendix A, the following parameters were observed at concentrations above calculated background values in downgradient monitoring wells, but below their respective GWPSs.

May 2020 Sampling Event	October 2020 Sampling Event
Boron (MW-8A and MW-10)	Boron (MW-8A and MW-10)
Molybdenum (MW-8A)	Molybdenum (MW-8A)
Sulfate (MW-8A and MW-14)	Sulfate (MW-8A)
--	Total Dissolved Solids (MW-8A)

Arsenic was detected above the GWPS at MW-8A during the October 2020 sampling event and is considered an SSI. In accordance with 40 CFR 257.95(g)(3), when an Appendix IV constituent is detected at a level greater than the GWPS one of the following measures must be taken within 90 days:

1. Initiate an assessment of corrective measures as required by 40 CFR 257.96; or

2. Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

BPU is currently assessing whether a source other than the CCR unit may have resulted in elevated arsenic concentrations at MW-8A, or if the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. After a preliminary assessment of sampling procedures, laboratory reports, aquifer geochemistry and data trends, the elevated arsenic result is likely a result of natural variation in the aquifer as indicated by:

- Further statistical analysis of the October 2020 GWPS exceedance for arsenic at MW-8A suggests that the SSI, while above the calculated GWPS for the BA Pond, is within the range of natural variability when calculated using historical data for MW-8A;

- Deviations from normal groundwater flow at the BA Pond were observed in May 2020, indicating groundwater was flowing from locations near the Missouri River towards the BA Pond. As a result, MW-8A was likely receiving groundwater from locations not monitored by upgradient wells for some portion of 2020. This may have resulted in influences to the groundwater chemistry at MW-8A that were not observed at the upgradient wells used to calculate the GWPS;

- The ORP measurement observed for MW-8A during the October 2020 sampling was the lowest reading recorded since the groundwater monitoring program was initiated in 2015 and suggests a shift in groundwater chemistry towards greater reducing conditions. Reducing aquifer conditions have been known to promote the mobilization of naturally occurring arsenic (Höhn et al., 2006) and can account for increases in dissolved phase arsenic results in groundwater samples. The timing of this shift to greater reducing conditions aligns with the 2019 flooding of the Missouri River when river water was pooled and recharged to the aquifer at locations near MW-8A, but not other upgradient wells. The timing of this shift in ORP and the absence of a documented release of CCR suggest the elevated concentrations are a result of natural events and not a release of CCR to groundwater. Furthermore, a reduction in sulfate was observed at MW-8A following the 2019 flood which aligns with a shift to a more reducing environment as sulfate would be reduced to sulfide (Jones and Ingle, 2005).

Results of this assessment will be reported under separate cover, as specified in 40 CFR 257.95(g)(3), no later than 90 days from December 18, 2020 when the SSI was identified.

5.0 ACCOUNT OF VOLUNTARY CORRECTIVE ACTIONS COMPLETED

In 2020, BPU voluntarily initiated closure by removal activities for the BA Pond in accordance with the *Bottom Ash Closure Plan* dated November 2, 2018 (Burns & McDonnell, 2018b) and the KDHE-approved *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). The following is a discussion of the voluntary closure activities completed during the 2020 reporting period:

The last known volume of CCR removed from the BA Pond for beneficial use occurred on February 12, 2020, which is also the date on which voluntary impoundment closure activities were initiated. On March 23, 2020, CCR removal activities were considered substantially complete. Over-excavation of the existing impoundment soil liner materials commenced on March 26, 2020. The impoundment liner over-excavation activities were completed on June 23, 2020. The embankment berms of the BA Pond were razed and soil, visually confirmed to be free of ash, was used to regrade the BA Pond in order to generally restore the natural stormwater drainage pattern toward the Missouri River per the *Bottom Ash Pond CQA Plan* (Burns & McDonnell, 2020a). Six additional inches of topsoil were then backfilled and seeded in order to sustain and promote vegetative growth. The addition of the topsoil layer and seeding activities were completed on October 19, 2020.

6.0 CERTIFICATIONS AND NOTIFICATIONS TO THE OPERATING RECORD

The following certifications and notifications were made to the operating record and/or were posted to the BPU's publicly accessible CCR website during the reporting period:

- *2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2020c)
- Documentation of the measurements of the groundwater monitoring wells, as required by 257.91(e)(1).
- Copies of analytical data reports as required by the CCR groundwater monitoring program.
- GWPSs
- *Statistical Evaluation of May 2020 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond* (Burns & McDonnell, 2020d)
- *Notification Regarding Groundwater Protection Standards* (Burns & McDonnell, 2020c)

7.0 KEY ACTIVITIES FOR THE UPCOMING YEAR

Groundwater monitoring and statistical assessments are expected to be performed in 2021 as required by the BA Pond assessment monitoring program. BPU will complete the Alternate Source Demonstration described in Section 4.0 by March 18, 2021 to meet the requirements of 40 CFR 257.95 (g)(3).

8.0 REFERENCES

Burns & McDonnell, 2016a, *Groundwater Monitoring Plan for the Nearman Creek Power Station Bottom Ash Pond*, March 14.

Burns & McDonnell, 2016b, *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond*, March 14.

Burns & McDonnell, 2018a. *2017 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2018b. *Bottom Ash Closure Plan.* November 2.

Burns & McDonnell, 2018c. *Update to Statistical Method for Evaluating Groundwater at Kansas City Board of Public Utilities Nearman Creek Power Station Bottom Ash Pond.* September 13.

Burns & McDonnell, 2019a. *2018 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2020a. *Bottom Ash Pond CQA Plan*. Revised June 5.

Burns & McDonnell, 2020b. *2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond.* January 31.

Burns & McDonnell, 2020c. *Notification Regarding Groundwater Protection Standards.* February 10.

Burns & McDonnell, 2020d. *Statistical Evaluation of May 2020 Assessment Monitoring Data*. September 11.

Höhn, R., Isenbeck-Schröter, M., Kent, D.B., Davis, J.A., Jakobsen, R., Jann, S., Niedan, V., Scholz, C., Stadler, S., Tretner, A., 2006. *Tracer test with As(V) under variable redox conditions controlling arsenic transport in the presence of elevated ferrous iron concentrations.* Journal of Contaminant Hydrology 88 36-54.

Jones, B. and Ingle Jr, J., 2005. *Evaluation of redox indicators for determining sulfate-reducing and dechlorinating conditions.* Water Research 39 4343-4345

United States Environmental Protection Agency (USEPA), 2015, *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, 40 CFR Parts 257 and 261, Federal Register, Vol. 80, No. 74, April 17, http://www.gpo.gov/fdsys/pkg/FR-2015-04-17/pdf/2015-00257.pdf.

USEPA, 2018. *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One).* 40 CFR Part 257, Federal Registrar, Vol. 83, No. 146, July 30. https://www.federalregister.gov/documents/2018/07/30/2018-16262/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric-utilities.

USEPA, 2020. *Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; A Holistic Approach to Closure Part A: Deadline to Initiate Closure.* 40 CFR Part 257, Federal Register, **Vol. 85, No. 53516** September 28. https://www.federalregister.gov/documents/2020/08/28/2020-16872/hazardous-and-solid-waste-management-system-disposal-of-coal-combustion-residuals-from-electric

TABLES

Table 3-1
Monitoring Well Gauging Data - May 29, 2020
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Well	Date Measured	Top of Casing Elevation (ft MSL)[1]	Total Depth Constructed (ft bTOC)	Measured Total Depth (ft bTOC)	Measured Water Level (ft bTOC)	Elevation of Water Level (ft MSL)
MW-2A	5/29/2020	747.86	31.68	31.74	15.54	732.32
MW-3	5/29/2020	750.44	34.70	34.50	18.70	731.74
MW-4	5/29/2020	746.90	31.75	31.98	15.63	731.27
MW-8A	5/29/2020	750.10	35.17	35.32	18.62	731.48
MW-10	5/29/2020	745.25	29.50	29.62	13.00	732.25
MW-13	5/29/2020	747.81	33.48	33.45	12.59	735.22
MW-14	5/29/2020	749.18	33.27	33.30	16.43	732.75
MW-15	5/29/2020	752.88	32.70	32.80	15.15	737.73
MW-16	5/29/2020	748.43	32.59	32.65	16.71	731.72

Notes:

[1] - Elevations as presented by Atlas Surveyors on *Survey of Monitoring Wells* dated December 4, 2018.

ft - feet

ft bTOC - feet below top of casing

ft MSL - feet above mean sea level

Table 3-2
Monitoring Well Gauging Data - October 30, 2020
Kansas City Board of Public Utilities
Nearman Creek Power Station Bottom Ash Pond

Well	Date Measured	Top of Casing Elevation (ft MSL)[1]	Total Depth Constructed (ft bTOC)	Measured Total Depth (ft bTOC)	Measured Water Level (ft bTOC)	Elevation of Water Level (ft MSL)
MW-2A	10/30/2020	747.86	31.68	31.52	22.82	725.04
MW-3	10/30/2020	750.44	34.70	34.55	25.10	725.34
MW-4	10/30/2020	746.90	31.75	31.71	21.72	725.18
MW-8A	10/30/2020	750.10	35.17	35.10	26.23	723.87
MW-10	10/30/2020	745.25	29.50	29.42	20.85	724.40
MW-13	10/30/2020	747.81	33.48	33.28	20.98	726.83
MW-14	10/30/2020	749.18	33.27	33.10	28.63	720.55
MW-15	10/30/2020	752.88	32.70	32.56	26.08	726.80
MW-16	10/30/2020	748.43	32.59	32.45	22.30	726.13

Notes:

[1] - Elevations as presented by Atlas Surveyors on *Survey of Monitoring Wells* dated December 4, 2018.

ft - feet

ft bTOC - feet below top of casing

ft MSL - feet above mean sea level

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3
						Sample Date	10/29/2015	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/24/2017	4/24/2017	7/25/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**										
Appendix III - Detection Monitoring															
6010B	Boron	mg/L	0.272	--	--		0.218	0.219	0.244	0.272	0.24	0.208	0.2 U	0.218	0.226
6010B	Calcium	mg/L	246	--	--		194	199	201	235	218	212	191	218	195
9056MOD	Chloride	mg/L	32.67	--	--		4.45	4.65	4.64	4.37	5.23	5.88	7.83	6.69	5.63
9056MOD	Fluoride	mg/L	0.486	--	--		0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157
9040C	pH	su	6.56 - 8.29	--	--		6.83 J	6.93 J	6.82 J	6.75 J	8.29 J	6.56 J	6.85 J	6.78 J	6.79 J
In Situ	pH	su	6.31 - 8.60	--	--		6.93	6.7	6.33	6.87	6.74	6.75	6.68	6.63	6.6
9056MOD	Sulfate	mg/L	213.5	--	--		109	114	121	117	121	130	115	143	106
2540 C-2011	Total Dissolved Solids	mg/L	950.2	--	--		717	749	771	845	697	831	715	827	733
Appendix IV - Assessment Monitoring															
6010B/6020	Antimony	mg/L	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/L	0.035	0.035	0.035		0.0021	0.00269	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/L	0.354	2	--		0.151	0.152	0.154	0.197	0.173	0.165	0.145	0.159	0.177
6010B	Beryllium	mg/L	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/L	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/L	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/L	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/L	0.588	4	--		0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157
6010B/6020	Lead	mg/L	--	--	--		0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/L	0.0712	0.0712	--		0.0441	0.0525	0.0528	0.0536	0.0551	0.0542	0.0548	0.0461	0.0486
7470A	Mercury	mg/L	--	--	--		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/L	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/L	0.0562	0.0562	--		0.01 U	0.00576	0.00406	0.0196	0.00685	0.002 U	0.002 U	0.00411	0.00568
6010B/6020	Thallium	mg/L	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.637	1.63	2.09	0.630 J	1.06	4.26	1.27 J	NS	1.27 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3
						Sample Date	3/8/2018	6/4/2018	10/2/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	10/19/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**									
Appendix III - Detection Monitoring														
6010B	Boron	mg/l	0.272	--	--		NS	0.212	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		NS	215	207	NS	136	181	153	198
9056MOD	Chloride	mg/l	32.67	--	--		NS	5.74	7.13	NS	7.37	7.35	9.33	6.91
9056MOD	Fluoride	mg/l	0.486	--	--		NS	0.173 J+	0.186	NS	0.218	0.180	0.191	0.178
9040C	pH	su	6.56 - 8.29	--	--		NS	6.94 J	6.83 J	NS	7.23 J	6.84 J	7.09 J	6.97 J
In Situ	pH	su	6.31 - 8.60	--	--		6.45	7.18	6.66	6.6	6.74	6.74	6.3	6.65
9056MOD	Sulfate	mg/l	213.5	--	--		NS	137	136	NS	66.9	93.4	106	117
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		NS	788	747	NS	506	638	609	737
Appendix IV - Assessment Monitoring														
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.00219	0.002 U	0.0021	0.002 U	0.00216	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.354	2	--		0.164	0.159	0.163	NS	0.162	0.183	0.151	0.17
6010B	Beryllium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.134	0.173 J+	0.186	NS	0.218	0.18	0.191	0.178
6010B/6020	Lead	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0608	0.0606	0.0481	NS	0.0239	0.0462	0.0421	0.0521
7470A	Mercury	mg/l	--	--	--		0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	NS	NS	NS	0.002 U	0.01 U	0.002 U	0.00224
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		1.06	1.62	0.555 J	NS	2.07	1.01	1.19	0.118

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4
					Sample Date	10/30/2015	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/24/2017	4/24/2017	7/26/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**									
Appendix III - Detection Monitoring														
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	200	191	206	181 V	186	207	224	193	186
9056MOD	Chloride	mg/l	32.67	--	--	9.72	8.98	13.4	3.9	6.27	11.2	12.4	6.6	4.92
9056MOD	Fluoride	mg/l	0.486	--	--	0.112	0.12	0.108	0.104	0.131	0.172	0.119	0.135	0.148 J-
9040C	pH	su	6.56 - 8.29	--	--	6.92 J	7.02 J	6.84 J	6.87 J	7.30 J	6.87 J	6.86 J	6.71 J	6.88 J
In Situ	pH	su	6.31 - 8.60	--	--	6.8	6.7	6.11	6.81	6.86	6.81	6.69	6.79	6.7
9056MOD	Sulfate	mg/l	213.5	--	--	116	109	128	74.5	96.2	148	148	117	100
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--	780	736	755	683	837	774	840	736	732
Appendix IV - Assessment Monitoring														
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.354	2	--	0.16	0.148	0.152	0.141	0.149	0.173	0.151	0.14	0.146
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--	0.112	0.12	0.108	0.104	0.131	0.172	0.119	0.135	0.148 J-
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0712	0.0708	--	0.0372	0.0439	0.0418	0.0425	0.0464	0.0411	0.0442	0.0353	0.0428
7470A	Mercury	mg/l	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.0423	0.0562	0.00642	0.0315	0.0383	0.0155	0.002 U	0.022	0.0186
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--	0.266	1.16	0.46	0.700 J	0.756	0.18 U*	0.191	NS	0.191 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4
						Sample Date	3/8/2018	6/4/2018	10/2/2018	11/20/2018	7/2/2019	11/26/2019	5/27/2020	10/19/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**									
Appendix III - Detection Monitoring														
6010B	Boron	mg/l	0.272	--	--		NS	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--		NS	214 O1 V	176	NS	89.9	128	125	122
9056MOD	Chloride	mg/l	32.67	--	--		NS	3.59	1.95	NS	8.22	6.94	7.45	9.94
9056MOD	Fluoride	mg/l	0.486	--	--		NS	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175
9040C	pH	su	6.56 - 8.29	--	--		NS	6.93 J	6.91 J	NS	7.56 J	7.10 J	7.41 J	7.23 J
In Situ	pH	su	6.31 - 8.60	--	--		6.68	6.94	6.80	6.7	7.29	6.9	6.35	6.85
9056MOD	Sulfate	mg/l	213.5	--	--		NS	116	87	NS	64.1	59.7	36.3	66.5
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		NS	741	619	NS	358	481	488	478
Appendix IV - Assessment Monitoring														
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.354	2	--		0.135	0.134	0.121	NS	0.112	0.134	0.14	0.118
6010B	Beryllium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.132	0.156 J+	0.177	NS	0.314	0.235	0.15 U	0.175
6010B/6020	Lead	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0458	0.051	0.0304	NS	0.0177	0.0265	0.0281	0.034
7470A	Mercury	mg/l	--	--	--		0.0002 U	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	NS	NS	NS	0.002 U	0.01 U	0.00289	0.00252
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.168	0.876	0.186 J	NS	1.66 J	0.115	0.0763	2.34

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-2A	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-2	MW-2A	DUP-1
					Sample Date	10/29/2015	1/27/2016	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/23/2017	4/24/2017	4/24/2017	7/25/2017	7/25/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*	
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	0.2 U	0.2 U	0.221	0.353	0.261	0.2 U	0.495	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	223	208	206	200 V	231	163	193	128	130	138	140
9056MOD	Chloride	mg/l	32.67	--	--	7.54	5.81	5.92	6.47	6.64	9.7	14.9	9.83	9.88	9.67	9.67
9056MOD	Fluoride	mg/l	0.486	--	--	0.129	0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
9040C	pH	su	6.56 - 8.29	--	--	6.86 J	6.91 J	6.93 J	6.85 J	6.69 J	7.00 J	6.84 J	7.0 J	7.02 J	6.94 J	7.01 J
In Situ	pH	su	6.31 - 8.60	--	--	6.96	6.8	6.8	6.26	6.63	6.86	6.75	6.85	6.85	6.84	6.84
9056MOD	Sulfate	mg/l	213.5	--	--	227	180	182	153	196	127	153	81.6	82.5	74.6	74.7
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--	852	811	783	848	865	616	734	508	478	512	506
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00361	0.00468	0.00465	0.00416	0.00492	0.00499	0.00541	0.00381	0.00326	0.00578	0.00553
6010B	Barium	mg/l	0.354	2	--	0.127	0.125	0.126	0.12	0.135	0.102	0.129	0.0796	0.0796	0.111	0.111
6010B	Beryllium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	0.0112	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--	0.129	0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
6010B/6020	Lead	mg/l	--	--	--	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0712	0.0708	--	0.0357	0.0395	0.04	0.0442	0.0457	0.0351	0.0334	0.0305	0.0305	0.0206	0.0221
7470A	Mercury	mg/l	--	--	--	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--	0.763	2.45	1.21	1.33	1.68	0.72	1.7	0.214 J	0.597 J	NS	NS

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-1	MW-2A	DUP-1	MW-2A	MW-2A
						Sample Date	9/14/2017	9/14/2017	3/8/2018	6/4/2018	10/1 & 10/3/2018	11/20/2018	7/1/2019	7/1/2019	11/26/2019	11/26/2019	5/27/2020	10/19/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*			
Appendix III - Detection Monitoring																		
6010B	Boron	mg/l	0.272	--	--		0.2 U	0.2 U	NS	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.221
6010B	Calcium	mg/l	246	--	--		155	155	NS	156	163	NS	127 V	127	122	123	137	168 V
9056MOD	Chloride	mg/l	32.67	--	--		6.26	6.33	NS	4.34	5.12	NS	8.82	8.96	14.0	13.9	14	12.7
9056MOD	Fluoride	mg/l	0.486	--	--		0.186	0.181	NS	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271	0.278	0.234
9040C	pH	su	6.56 - 8.29	--	--		6.91 J	6.99 J	NS	7.05 J	6.96 J	NS	8.23 J	7.47 J	7.23 J	7.23 J	7.73 J	7.14 J
In Situ	pH	su	6.31 - 8.60	--	--		6.8	6.8	6.39	6.81	6.80	6.7	6.85	6.85	7.01	7.01	6.38	6.79
9056MOD	Sulfate	mg/l	213.5	--	--		89	89.6	NS	53.8	68.5	NS	86.3	87.2	108	109	110	113
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		571	568	NS	537	580	NS	462	462	471	436	545	622
Appendix IV - Assessment Monitoring																		
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.00487	0.00487	0.00428	0.002 U	0.00359	0.00324	0.002 U	0.002 U	0.00248	0.00246	0.0042	0.00289
6010B	Barium	mg/l	0.354	2	--		0.116	0.115	0.184	0.147	0.157	NS	0.11	0.107	0.116	0.115	0.143	0.171
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.186	0.181	0.166	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271	0.278	0.234
6010B/6020	Lead	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0294	0.0298	0.0372	0.0352	0.027	NS	0.0204	0.0202	0.0205	0.0223	0.0172	0.0302
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	0.0002 U	NS	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.002 U	0.002 U	0.01 U	NS	NS	NS	0.002 U	0.002 U	0.01 U	0.01 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		1.31 J	1.10 J	0.864	1.64	1.25 J	NS	0.318 J	0.396 J	0.696	0.519	1.06	0.727

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix B

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-8A	DUP-1A	MW-8A	MW-8A	DUP-2	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A
						Sample Date	10/29/2015	10/29/2015	1/27/2016	4/28/2016	4/28/2016	7/25/2016	10/25/2016	1/23/2017	4/24/2017	7/25/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*			*Duplicate Pair*							
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		2.37	2.38	2.48	2.61	2.67	2.66	2.29	2.38	2.26	2.4	2.27
6010B	Calcium	mg/l	246	--	--		186	185	168	186	182	204	156	146	126	161	153
9056MOD	Chloride	mg/l	32.67	--	--		26.5	30.3	30.4	30.2	30.1	29.3	30.3	26.9	29.6	28.9	28.4
9056MOD	Fluoride	mg/l	0.486	--	--		0.54	0.318	0.267	0.339	0.339	0.292	0.355	0.413	0.37	0.325	0.268
9040C	pH	su	6.56 - 8.29	--	--		6.94 J	6.97 J	7.04 J	6.93 J	6.88 J	6.78 J	7.97 J	6.72 J	6.91 J	6.88 J	6.89 J
In Situ	pH	su	6.31 - 8.60	--	--		6.94	6.94	6.9	6.75	6.75	6.56	6.92	6.88	6.86	6.73	6.74
9056MOD	Sulfate	mg/l	213.5	--	--		491	598	471	520	522	453	412	386	383	477	380
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		1180	1130	1060	1170	1170	1190	1040	935	880	1020	1000
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.012	0.0132	0.0127	0.0308	0.0299	0.0122	0.0134	0.0156	0.0232	0.0145	0.0144
6010B	Barium	mg/l	0.354	2	--		0.073	0.0738	0.0635	0.0937	0.0924	0.0624	0.0473	0.0524	0.0565	0.0539	0.0541
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.54	0.318	0.267	0.339	0.339	0.292	0.355	0.413	0.37	0.325	0.268
6010B/6020	Lead	mg/l	--	--	--		0.005 U	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0243	0.0242	0.0309	0.0298	0.0298	0.0368	0.0316	0.0268	0.0275	0.0201	0.0269
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.00584	0.00591	0.005 U	0.005 U	0.00623	0.00685	0.00569	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.36	0.298	1.44	0.673	0.127	1.45	1.11	0.536	1.07 J	NS	0.980 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-8A	DUP-1	MW-8A	DUP-1	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A	MW-8A
						Sample Date	3/8/2018	3/8/2018	6/4/2018	6/4/2018	10/1 & 10/3/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	10/19/2020	12/8/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**		*Duplicate Pair*		*Duplicate Pair*								
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--		NS	NS	2.44	2.47	2.31	NS	1.06	2.09 O1	2.24	2.66	NS
6010B	Calcium	mg/l	246	--	--		NS	NS	129	129	122	NS	105	115 O1	99.8	160	NS
9056MOD	Chloride	mg/l	32.67	--	--		NS	NS	25.7	25.5	26.2	NS	21.0	27.0	27.2	23.9	NS
9056MOD	Fluoride	mg/l	0.486	--	--		NS	NS	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.428	0.357	NS
9040C	pH	su	6.56 - 8.29	--	--		NS	NS	6.97 J	6.98 J	6.95 J	NS	7.25 J	7.11 J	7.64 J	7.17 J	NS
In Situ	pH	su	6.31 - 8.60	--	--		6.91	6.91	6.86	6.86	6.86	6.6	7.14	7.07	6.62	6.9	NS
9056MOD	Sulfate	mg/l	213.5	--	--		NS	NS	353	360	419	NS	223	324	285	353	NS
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		NS	NS	853	881	920	NS	636	787	689	953	NS
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS
6020	Arsenic	mg/l	0.035	0.035	0.035		0.0206	0.021	0.0204	0.0195	0.0278	0.0183	0.0128	0.0266	0.0197	**0.0373**	**0.0354**
6010B	Barium	mg/l	0.354	2	--		0.0657	0.065	0.0559	0.0548	0.0602	NS	0.201	0.176 O1	0.147	0.194	NS
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS
9056MOD	Fluoride	mg/l	0.588	4	--		0.348	0.347	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.428	0.357	NS
6010B/6020	Lead	mg/l	--	--	--		0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	NS
6010B	Lithium	mg/l	0.0712	0.0708	--		0.029	0.0281	0.0262	0.031	0.0174	NS	0.0277	0.0188	0.0195	0.0281	NS
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	NS	NS	NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100	--		0.00833	0.00816	0.00865	0.00876	0.00967	NS	0.00524	0.00953	0.0111	0.0105	NS
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	0.01 U	NS	NS	NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.628	0.308	1.61	1.54	0.589 J	NS	0.107 J	0.491	0.0386	0.919	NS

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-10	MW-10	MW-10	DUP-1	MW-10	DUP-1	MW-10	DUP-1	MW-10	MW-10	MW-10	MW-10
						Sample Date	10/29/2015	1/27/2016	4/27/2016	4/27/2016	7/25/2016	7/25/2016	10/26/2016	10/26/2016	1/23/2017	4/24/2017	7/25/2017	9/14/2017
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**				*Duplicate Pair*				*Duplicate Pair*					
Appendix III - Detection Monitoring																		
6010B	Boron	mg/l	0.272	--	--		1.08	0.907	1.35	1.35	1.05	1.04	1.04	0.2 U	1.29	1.24	1.29	1.19
6010B	Calcium	mg/l	246	--	--		217	213	179	178	218	217	217	221	191	157	193	195
9056MOD	Chloride	mg/l	32.67	--	--		30.2	17	21.9	21.8	20.4	20.4	18	46.3	23.2	21.6	26	22.6
9056MOD	Fluoride	mg/l	0.486	--	--		0.327	0.104	0.125	0.105	0.125	0.1 U	0.111	0.101	0.183	0.161	0.143	0.144
9040C	pH	su	6.56 - 8.29	--	--		6.82 J	6.89 J	6.92 J	6.96 J	6.73 J	6.78 J	7.02 J	7.46 J	6.86 J	7.01 J	6.88 J	6.82 J
In Situ	pH	su	6.31 - 8.60	--	--		7.03	7.1	6.5	6.5	6.66	6.66	6.7	6.7	6.78	6.87	6.7	6.64
9056MOD	Sulfate	mg/l	213.5	--	--		623	227	220	226	223	217	228	75	238	193	280	258
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		1130	916	797	820	905	903	911	739	845	709	852	880
Appendix IV - Assessment Monitoring																		
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.00743	0.00489	0.0135	0.0115	0.00519	0.00536	0.00351	0.00365	0.0107	0.0143	0.00612	0.00635
6010B	Barium	mg/l	0.354	2	--		0.183	0.106	0.0871	0.0857	0.0875	0.0875	0.0825	0.082	0.0897	0.088	0.0748	0.0705
6010B	Beryllium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.327	0.104	0.125	0.105	0.125	0.1 U	0.111	0.11	0.183	0.161	0.143	0.144
6010B/6020	Lead	mg/l	--	--	--		0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0501	0.0571	0.045	0.0446	0.0549	0.0545	0.0578	0.0571	0.0494	0.0399	0.0376	0.0495
7470A	Mercury	mg/l	--	--	--		0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.442	2.32	1.77	1.16	0.550 J	0.520 J	0.877 J	0.603 J	0.253	0.848 J	NS	1.10 J

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

						Sample Location	MW-10	MW-10	MW-10	DUP-1	MW-10	DUP	MW-10	MW-10	MW-10	DUP-1	MW-10	DUP-1
						Sample Date	3/8/2018	6/4/2018	10/1 & 10/3/2018	10/1 &10/3/2018	11/20/2018	11/20/2018	7/1/2019	11/26/2019	5/27/2020	5/27/2020	10/19/2020	10/19/20
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**				*Duplicate Pair*						*Duplicate Pair*		*Duplicate Pair*	
Appendix III - Detection Monitoring																		
6010B	Boron	mg/l	0.272	--	--		NS	1.5	1.22	1.23	NS	NS	0.2 U	1.36	1.17	1.14	1.22	1.2
6010B	Calcium	mg/l	246	--	--		NS	168	179	179	NS	NS	101	198	173	173	168	170
9056MOD	Chloride	mg/l	32.67	--	--		NS	19.6	18.6	18.7	NS	NS	11.3	16.3	9.86	9.87	12.2	12.1
9056MOD	Fluoride	mg/l	0.486	--	--		NS	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
9040C	pH	su	6.56 - 8.29	--	--		NS	6.94 J	6.98 J	6.96 J	NS	NS	7.47 J	6.91 J	6.99 J	7.06 J	7.42 J	7.50 J
In Situ	pH	su	6.31 - 8.60	--	--		6.41	6.61	6.80	6.80	6.6	6.6	7.2	6.74	6.25	6.25	6.7	6.7
9056MOD	Sulfate	mg/l	213.5	--	--		NS	214	234	232	NS	NS	104	180	138	138	143	144
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--		NS	748	822	808	NS	NS	441	832	761	751	752	736
Appendix IV - Assessment Monitoring																		
6010B/6020	Antimony	mg/l	--	--	--		0.002 U	NS	NS	NS	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035		0.0158	0.0126	0.0245	0.0241	0.00789	0.00821	0.00228	0.002 U	0.002 U	0.002 U	0.00461	0.00475
6010B	Barium	mg/l	0.354	2	--		0.0993	0.107	0.129	0.128	NS	NS	0.0725	0.138	0.129	0.128	0.116	0.116
6010B	Beryllium	mg/l	--	--	--		0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--		0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--		0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--		0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--		0.164	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.162	0.162	0.167	0.168
6010B/6020	Lead	mg/l	--	--	--		0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--		0.0418	0.0445	0.0281	0.0286	NS	NS	0.0165	0.0483	0.04	0.0367	0.0446	0.0412
7470A	Mercury	mg/l	--	--	--		0.0002 U	NS	NS	NS	NS	NS	0.0002 U	NS	0.0002	0.0002	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--		0.005 U	0.005 U	0.005 U	0.005 U	NS	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--		0.01 U	NS	NS	NS	NS	NS	0.00922	0.01 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--		0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--		0.102	1.18	0.35 J	0.35	NS	NS	0.414	2.06	0.213	0.808	1.26	0.888

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	MW-14	MW-14	MW-14	MW-14	MW-14	MW-14
					Sample Date	10/1/2018	11/19/2018	7/2/2019	11/26/2019	5/28/2020	10/19/2020	10/1/2018	11/19/2018	7/2/2019	11/26/2019	5/27/2020	10/19/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**												
Appendix III - Detection Monitoring																	
6010B	Boron	mg/l	0.272	--	--	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	95	NS	90.9	115	125	181	200	NS	114	130	200	218
9056MOD	Chloride	mg/l	32.67	--	--	19.5	NS	22.1	21.3	20.2	20.6	21.5	NS	10.5	12.9	22.1	16
9056MOD	Fluoride	mg/l	0.486	--	--	0.38	NS	0.317	0.405	0.375	0.294	0.208	NS	0.231	0.265	0.22	0.199
9040C	pH	su	6.56 - 8.29	--	--	7.1 J	NS	7.08 J	7.08 J	7.40 J	6.94	6.7 J	NS	7.21 J	7.11 J	7.12 J	6.83 J
In Situ	pH	su	6.31 - 8.60	--	--	8.67	6.979	6.79	7.01	6.45	6.77	6.7	6.804	6.93	6.94	6.49	6.59
9056MOD	Sulfate	mg/l	213.5	--	--	155	NS	154	165	146	92.4	221	NS	82	121	253	181
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--	542	NS	520	580	637 J4	704	839	NS	490	533	915	882
Appendix IV - Assessment Monitoring																	
6010B/6020	Antimony	mg/l	--	--	--	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0252	0.024	0.00957	0.0201	0.024	0.0303	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Barium	mg/l	0.354	2	--	0.205	NS	0.235	0.251	0.285	0.354	0.0765	NS	0.074	0.0864	0.129	0.138
6010B	Beryllium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--	0.38	NS	0.317	0.405	0.375	0.294	0.208	NS	0.231	0.265	0.22	0.199
6010B/6020	Lead	mg/l	--	--	--	NS	NS	0.002 U	NS	0.005 U	0.005 U	NS	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--	0.0296	NS	0.0314	0.0358	0.0336	0.0356	0.0297	NS	0.015 U	0.0154	0.0273	0.0287
7470A	Mercury	mg/l	--	--	--	NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS	NS	0.002 U	0.01 U	0.002 U	0.0118
6010B/6020	Thallium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--	0.765 J	NS	1.18 J	0.546	0.776	3.19	0.138 J	NS	0.69 J	0.107	1.26	1.51

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

Table 3-3
Summary of Analytical Results
October 2015 through December 2020 Sampling Events
Kansas City Board of Public Utilities
Nearman Creak Power Station Bottom Ash Pond

					Sample Location	MW-15	MW-15	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	MW-16	MW-16
					Sample Date	10/1/2018	11/19/2018	7/1/2019	11/26/2019	5/27/2020	10/20/2020	11/19/2018	7/1/2019	11/25/2019	5/28/2020	5/28/2020
Analytical Method	**Analyte**	**Unit**	**Calculated Background Limit[1]**	**GWPS[2]**	**ASD Background Limit[3]**											
Appendix III - Detection Monitoring																
6010B	Boron	mg/l	0.272	--	--	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	NS	0.217	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	246	--	--	78.3	NS	88	71.4	78.8	82.6	NS	246	224	183	231 V
9056MOD	Chloride	mg/l	32.67	--	--	16.4	NS	17.4	13.9	20.8	21.4	NS	2.54	4.01	11.7	35.4
9056MOD	Fluoride	mg/l	0.486	--	--	0.462	NS	0.282	0.486	0.208	0.424	NS	0.155	0.136	0.15 U	0.15 U
9040C	pH	su	6.56 - 8.29	--	--	7.45 J	NS	7.71 J	7.45 J	7.80 J	7.71	NS	6.76 J	6.76 J	6.88 J	6.84 J
In Situ	pH	su	6.31 - 8.60	--	--	6.9	6.878	7.55	7.34	7.88	7.28	6.863	6.58	6.8	6.58	6.57
9056MOD	Sulfate	mg/l	213.5	--	--	194	NS	164	162	218	211	NS	172	123	121	115
2540 C-2011	Total Dissolved Solids	mg/l	950.2	--	--	505	NS	496	452	521	560	NS	942	784	747 J4	821
Appendix IV - Assessment Monitoring																
6010B/6020	Antimony	mg/l	--	--	--	NS	NS	0.002 U	0.002 U	0.004 U	0.004 U	NS	0.002 U	0.002 U	0.004 U	0.004 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.00482	0.00509	0.00324	0.0104	0.00227	0.00488	0.035	0.0341	0.0342	0.0305	0.0313
6010B	Barium	mg/l	0.354	2	--	0.107	NS	0.097	0.103	0.0977	0.114	NS	0.259	0.257	0.245	0.298
6010B	Beryllium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l	--	--	--	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l	--	--	--	NS	NS	0.01 U	NS	0.01 U	0.01 U	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.588	4	--	0.462	NS	0.282	0.486	0.208	0.424	NS	0.155	0.136	0.15 U	0.15 U
6010B/6020	Lead	mg/l	--	--	--	NS	NS	0.002 U	NS	0.005 U	0.005 U	NS	0.002 U	NS	0.005 U	0.005 U
6010B	Lithium	mg/l	0.0712	0.0708	--	0.0428	NS	0.0295	0.0414	0.0405	0.0526	NS	0.0635	0.0646	0.0594	0.0596
7470A	Mercury	mg/l	--	--	--	NS	NS	0.0002 U	NS	0.0002	0.0002 U	NS	0.0002 U	NS	0.0002	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100	--	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562	--	NS	NS	0.002 U	0.01 U	0.002 U	0.002 U	NS	0.002 U	0.01 U	0.002 U	0.002 U
6010B/6020	Thallium	mg/l	--	--	--	NS	NS	0.002 U	NS	0.002 U	0.002 U	NS	0.002 U	NS	0.002 U	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	4.17	5	--	1.35 J	NS	0.219 J	0.398	0.859	0.234	NS	1.69 J	0.995	0.198	2.49

Notes:

Samples were collected when the BA Pond was in a Detection Monitoring Program

Samples were collected when the BA Pond was in an Assessment Monitoring Program

Bold = Concentration exceeds respective GWPS

1 = Calculated background limit as calculated as part of the December 18, 2020 assessment of the October 2020 assessment monitoring event.

2 = Groundwater Protection Standards established for the BA Pond by comparing calculated background limits, MCLs, and §257.95(h)(2) criteria, Appendix A.

3 = Calculated background limit for arsenic as calculated as part of the ASD dated December 12, 2018.

ASD = Alternate Source Demonstration

B = The same analyte is found in the associated blank

BA = Bottom Ash

GWPS = Groundwater Protection Standard

J = Result qualified as estimated

J+ = Result qualified as estimated with potential high bias

J- = Result qualified as estimated with potential low bias

MCL = Maximum Contaminant Level

mg/L = milligram per liter

NS = Not Sampled or Not Measured

O1 = The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference. (Lab Qualifier)

pCi/L = picocurie per liter

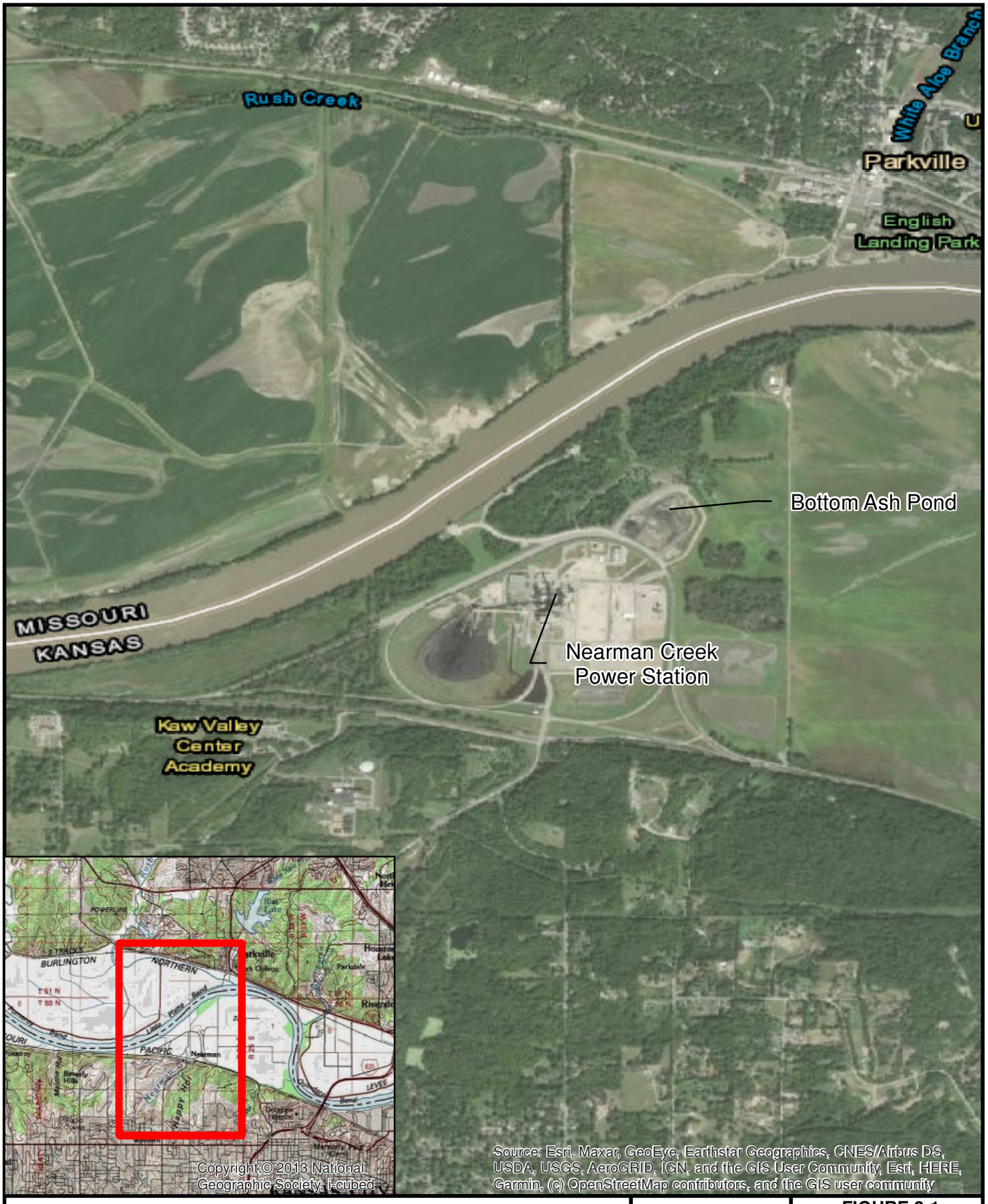
su = Standard Units

U = Non Detect at the identified concentration

U* = Qualified as non detect during data validation process

V = The sample concentration is too high to evaluate accurate spike recoveries (Lab Qualifier)

FIGURES



0 1,000 2,000
Feet

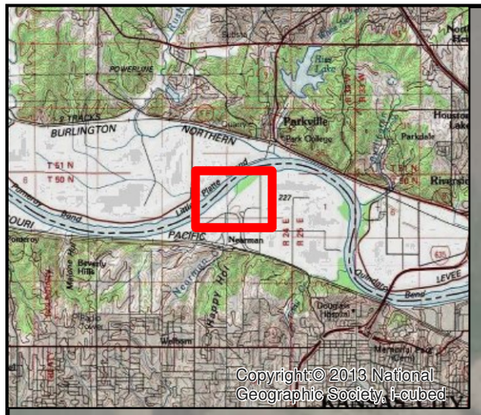
N

BURNS McDONNELL

FIGURE 2-1
SITE LOCATION
NEARMAN CREEK
POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Source: ESRI and Burns & McDonnell Engineering.
Issued: January, 6 2021

Path: Z:\Clients\ENS\KCBPU\88777_CCRGWMON\Studies\Geospatial\ArcDocs\2020 Report\Figure 2-1_Site Location Map.mxd



MW-13

MW-14

MW-10

MW-2A

MW-8A

MW-3

MW-15

MW-4

MW-16

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- BA Pond Monitoring Well - Upgradient
- BA Pond Monitoring Well - Downgradient

0 250 500

Feet

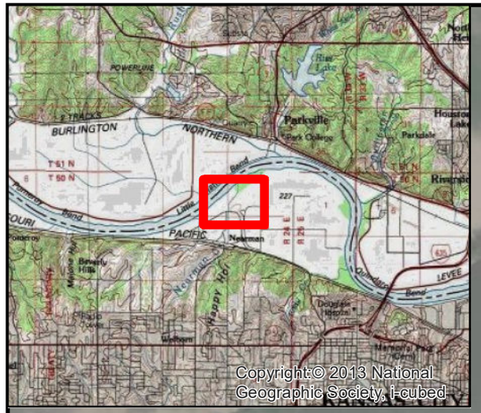
N

Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-1
MONITORING WELL LOCATIONS
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Issued: January, 6 2021



MW-13
735.22

MW-14
732.75

MW-10
732.25

MW-2A
732.32

MW-8A
731.48

MW-3
731.74

MW-15
737.73

MW-4
731.27

MW-16
731.72

735
734
733
734
735
736
737
732

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well
- 733.54 Water Level Elevation
- Piezometric Surface Contour
- Approximate Groundwater Flow Direction

Notes

1 - Piezometric surface was inferred using groundwater elevation data collected on May 29, 2020 and should be considered approximate.

0 200 400
Feet

N

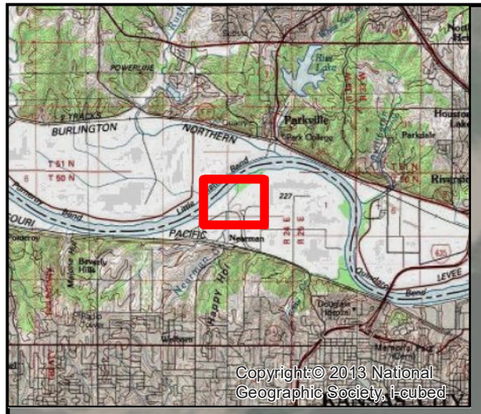
Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-2
MAY 29, 2020 POTENTIOMETRIC MAP
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Path: Z:\Clients\ENS\KCBPU\88777_CCRGWMON\Studies\Geospatial\ArcDocs\2020 Report\Figure3-2_CCRMay2020w.mxd

Issued: February, 4 2021



MW-13
726.83

MW-14
720.55

MW-10
724.40

MW-2A
725.04

MW-8A
723.87

MW-3
725.34

MW-15
726.80

MW-4
725.18

MW-16
726.13

721
722
723
724
725
726

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Monitoring Well
- 733.54 Water Level Elevation
- Piezometric Surface Contour
- Approximate Groundwater Flow Direction

Notes

1 - Piezometric surface was inferred using groundwater elevation data collected on October 30, 2020 and should be considered approximate.

0 200 400
Feet

N

Source: ESRI and Burns & McDonnell Engineering.

BURNS McDONNELL

FIGURE 3-3
OCT. 30 2020 POTENTIOMETRIC MAP
NEARMAN CREEK POWER STATION
KANSAS CITY BPU
KANSAS CITY, KS

Path: Z:\Clients\ENSI\KCBPU\88777_CCRGWMONStudies\GeospatialArcDocs\2020 Report\Figure3-3_CCROctober2020w.mxd

Issued: February, 4 2021

APPENDIX A – STATISTICAL EVALUATION

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/7/2020, 11:28 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	5/27/2020	0.0042	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-8A	0.035	n/a	5/27/2020	0.0197	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-10	0.035	n/a	5/27/2020	0.001ND	No	46	58.7	n/a	0.02063	NP (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	5/27/2020	0.001ND	No	46	58.7	n/a	0.02063	NP (NDs)
Barium (mg/l)	MW-2A	0.3006	n/a	5/27/2020	0.143	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-8A	0.3006	n/a	5/27/2020	0.147	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-10	0.3006	n/a	5/27/2020	0.129	No	41	0	ln(x)	0.01	Param
Barium (mg/l)	MW-14	0.3006	n/a	5/27/2020	0.129	No	41	0	ln(x)	0.01	Param
Boron (mg/l)	MW-2A	0.272	n/a	5/27/2020	0.1ND	No	39	74.36	n/a	0.02411	NP (NDs)
Boron (mg/l)	**MW-8A**	**0.272**	**n/a**	**5/27/2020**	**2.24**	**Yes**	**39**	**74.36**	**n/a**	**0.02411**	NP (NDs)
Boron (mg/l)	**MW-10**	**0.272**	**n/a**	**5/27/2020**	**1.17**	**Yes**	**39**	**74.36**	**n/a**	**0.02411**	NP (NDs)
Boron (mg/l)	MW-14	0.272	n/a	5/27/2020	0.1ND	No	39	74.36	n/a	0.02411	NP (NDs)
Calcium (mg/l)	MW-2A	246	n/a	5/27/2020	137	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-8A	246	n/a	5/27/2020	99.8	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-10	246	n/a	5/27/2020	173	No	38	0	n/a	0.02471	NP (normality)
Calcium (mg/l)	MW-14	246	n/a	5/27/2020	200	No	38	0	n/a	0.02471	NP (normality)
CHLORIDE (mg/l)	MW-2A	27.8	n/a	5/27/2020	14	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-8A	27.8	n/a	5/27/2020	27.2	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-10	27.8	n/a	5/27/2020	9.86	No	39	0	x^(1/3)	0.01	Param
CHLORIDE (mg/l)	MW-14	27.8	n/a	5/27/2020	22.1	No	39	0	x^(1/3)	0.01	Param
Combined Radium (pCi/l)	MW-2A	3.187	n/a	5/27/2020	1.06	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-8A	3.187	n/a	5/27/2020	0.0386	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-10	3.187	n/a	5/27/2020	0.213	No	39	0	sqrt(x)	0.01	Param
Combined Radium (pCi/l)	MW-14	3.187	n/a	5/27/2020	1.26	No	39	0	sqrt(x)	0.01	Param
Dissolved Solids (mg/l)	MW-2A	1012	n/a	5/27/2020	545	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-8A	1012	n/a	5/27/2020	689	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-10	1012	n/a	5/27/2020	761	No	39	0	No	0.01	Param
Dissolved Solids (mg/l)	MW-14	1012	n/a	5/27/2020	915	No	39	0	No	0.01	Param
Fluoride (mg/l)	MW-2A	0.486	n/a	5/27/2020	0.278	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-8A	0.486	n/a	5/27/2020	0.428	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-10	0.486	n/a	5/27/2020	0.162	No	41	7.317	n/a	0.023	NP (normality)
Fluoride (mg/l)	MW-14	0.486	n/a	5/27/2020	0.22	No	41	7.317	n/a	0.023	NP (normality)
Lithium (mg/l)	MW-2A	0.0712	n/a	5/27/2020	0.0172	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-8A	0.0712	n/a	5/27/2020	0.0195	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-10	0.0712	n/a	5/27/2020	0.04	No	41	0	No	0.01	Param
Lithium (mg/l)	MW-14	0.0712	n/a	5/27/2020	0.0273	No	41	0	No	0.01	Param
Molybdenum (mg/l)	MW-2A	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
Molybdenum (mg/l)	**MW-8A**	**0.005**	**n/a**	**5/27/2020**	**0.0111**	**Yes**	**41**	**100**	**n/a**	**0.023**	NP (NDs)
Molybdenum (mg/l)	MW-10	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	5/27/2020	0.0025ND	No	41	100	n/a	0.023	NP (NDs)
pH [Field] (su)	MW-2A	8.577	6.306	5/27/2020	6.386	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Field] (su)	MW-8A	8.577	6.306	5/27/2020	6.626	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Field] (su)	**MW-10***	**8.577**	**6.306**	**5/27/2020**	**6.256**	**Yes**	**46**	**0**	**n/a**	**0.04126**	NP (normality) Deseas
pH [Field] (su)	MW-14	8.577	6.306	5/27/2020	6.496	No	46	0	n/a	0.04126	NP (normality) Deseas
pH [Lab] (su)	MW-2A	8.29	6.56	5/27/2020	7.73	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	5/27/2020	7.64	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-10	8.29	6.56	5/27/2020	6.99	No	31	0	n/a	0.05977	NP (normality)
pH [Lab] (su)	MW-14	8.29	6.56	5/27/2020	7.12	No	31	0	n/a	0.05977	NP (normality)
Sulfate (mg/l)	MW-2A	209.6	n/a	5/27/2020	110	No	38	0	No	0.01	Param
Sulfate (mg/l)	**MW-8A**	**209.6**	**n/a**	**5/27/2020**	**285**	**Yes**	**38**	**0**	**No**	**0.01**	Param

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/7/2020, 11:28 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Sulfate (mg/l)	MW-10	209.6	n/a	5/27/2020	138	No	38	0	No	0.01	Param
Sulfate (mg/l)	**MW-14**	**209.6**	**n/a**	**5/27/2020**	**253**	**Yes**	**38**	**0**	**No**	**0.01**	Param

* While the pH [Field] result for MW-10 are presented in bold, this result does exceed the upper confidence limit calculated for pH. Furthermore, pH was also analyzed by a fixed laboratory and that result is within the upper and lower confidence limit presented above. As a result, this result was not considered a statistically significant increase above the calculated background limit.

Interwell Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/7/2020, 11:30 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Selenium (mg/l)	MW-2A	0.06757	n/a	5/27/2020	0.01520...	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-8A	0.06757	n/a	5/27/2020	0.01520...	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-10	0.06757	n/a	5/27/2020	0.01520...	No	35	57.14	n/a	0.02669	NP (NDs) Deseas
Selenium (mg/l)	MW-14	0.06757	n/a	5/27/2020	0.01520...	No	35	57.14	n/a	0.02669	NP (NDs) Deseas

Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_GW_CCR Printed 12/18/2020, 11:20 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Arsenic (mg/l)	MW-2A	0.035	n/a	10/19/2020	0.00289	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Arsenic (mg/l)	**MW-8A**	**0.035**	**n/a**	**10/19/2020**	**0.0373**	**Yes**	**51**	**56.86**	**n/a**	**0.0187**	**NP Inter (NDs)**
Arsenic (mg/l)	MW-10	0.035	n/a	10/19/2020	0.00461	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Arsenic (mg/l)	MW-14	0.035	n/a	10/19/2020	0.002ND	No	51	56.86	n/a	0.0187	NP Inter (NDs)
Barium (mg/l)	MW-2A	0.354	n/a	10/19/2020	0.171	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-8A	0.354	n/a	10/19/2020	0.194	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-10	0.354	n/a	10/19/2020	0.116	No	46	0	n/a	0.02063	NP Inter (normality)
Barium (mg/l)	MW-14	0.354	n/a	10/19/2020	0.138	No	46	0	n/a	0.02063	NP Inter (normality)
Boron (mg/l)	MW-2A	0.272	n/a	10/19/2020	0.221	No	44	77.27	n/a	0.02152	NP Inter (NDs)
Boron (mg/l)	**MW-8A**	**0.272**	**n/a**	**10/19/2020**	**2.66**	**Yes**	**44**	**77.27**	**n/a**	**0.02152**	**NP Inter (NDs)**
Boron (mg/l)	**MW-10**	**0.272**	**n/a**	**10/19/2020**	**1.22**	**Yes**	**44**	**77.27**	**n/a**	**0.02152**	**NP Inter (NDs)**
Boron (mg/l)	MW-14	0.272	n/a	10/19/2020	0.2ND	No	44	77.27	n/a	0.02152	NP Inter (NDs)
Calcium (mg/l)	MW-2A	246	n/a	10/19/2020	168	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-8A	246	n/a	10/19/2020	160	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-10	246	n/a	10/19/2020	168	No	43	0	n/a	0.02199	NP Inter (normality)
Calcium (mg/l)	MW-14	246	n/a	10/19/2020	218	No	43	0	n/a	0.02199	NP Inter (normality)
CHLORIDE (mg/l)	MW-2A	32.67	n/a	10/19/2020	12.7	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-8A	32.67	n/a	10/19/2020	23.9	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-10	32.67	n/a	10/19/2020	12.2	No	44	0	x^(1/3)	0.01	Param Inter
CHLORIDE (mg/l)	MW-14	32.67	n/a	10/19/2020	16	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/l)	MW-2A	4.171	n/a	10/19/2020	0.727	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/l)	MW-8A	4.171	n/a	10/19/2020	0.919	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/l)	MW-10	4.171	n/a	10/19/2020	1.26	No	44	0	x^(1/3)	0.01	Param Inter
Combined Radium (pCi/l)	MW-14	4.171	n/a	10/19/2020	1.51	No	44	0	x^(1/3)	0.01	Param Inter
Dissolved Solids (mg/l)	MW-2A	950.2	n/a	10/19/2020	622	No	44	0	x^2	0.01	Param Inter
Dissolved Solids (mg/l)	**MW-8A**	**950.2**	**n/a**	**10/19/2020**	**953**	**Yes**	**44**	**0**	**x^2**	**0.01**	**Param Inter**
Dissolved Solids (mg/l)	MW-10	950.2	n/a	10/19/2020	752	No	44	0	x^2	0.01	Param Inter
Dissolved Solids (mg/l)	MW-14	950.2	n/a	10/19/2020	882	No	44	0	x^2	0.01	Param Inter
Fluoride (mg/l)	MW-2A	0.486	n/a	10/19/2020	0.234	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-8A	0.486	n/a	10/19/2020	0.357	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-10	0.486	n/a	10/19/2020	0.167	No	46	8.696	n/a	0.02063	NP Inter (normality)
Fluoride (mg/l)	MW-14	0.486	n/a	10/19/2020	0.199	No	46	8.696	n/a	0.02063	NP Inter (normality)
Lithium (mg/l)	MW-2A	0.0712	n/a	10/19/2020	0.0302	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-8A	0.0712	n/a	10/19/2020	0.0281	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-10	0.0712	n/a	10/19/2020	0.0446	No	46	0	No	0.01	Param Inter
Lithium (mg/l)	MW-14	0.0712	n/a	10/19/2020	0.0287	No	46	0	No	0.01	Param Inter
Molybdenum (mg/l)	MW-2A	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
Molybdenum (mg/l)	**MW-8A**	**0.005**	**n/a**	**10/19/2020**	**0.0105**	**Yes**	**46**	**100**	**n/a**	**0.02063**	**NP Inter (NDs)**
Molybdenum (mg/l)	MW-10	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
Molybdenum (mg/l)	MW-14	0.005	n/a	10/19/2020	0.005ND	No	46	100	n/a	0.02063	NP Inter (NDs)
pH [Field] (su)	MW-2A	8.604	6.305	10/19/2020	6.724	No	51	0	n/a	0.0374	NP Inter (normality) ...
pH [Field] (su)	MW-8A	8.604	6.305	10/19/2020	6.834	No	51	0	n/a	0.0374	NP Inter (normality) ...
pH [Field] (su)	MW-10	8.604	6.305	10/19/2020	6.634	No	51	0	n/a	0.0374	NP Inter (normality) ...
pH [Field] (su)	MW-14	8.604	6.305	10/19/2020	6.524	No	51	0	n/a	0.0374	NP Inter (normality) ...
pH [Lab] (su)	MW-2A	8.29	6.56	10/19/2020	7.14	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-8A	8.29	6.56	10/19/2020	7.17	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-10	8.29	6.56	10/19/2020	7.42	No	36	0	n/a	0.05199	NP Inter (normality)
pH [Lab] (su)	MW-14	8.29	6.56	10/19/2020	6.83	No	36	0	n/a	0.05199	NP Inter (normality)
Selenium (mg/l)	MW-2A	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Selenium (mg/l)	MW-8A	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)

Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_GW_CCR Printed 12/18/2020, 11:20 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Selenium (mg/l)	MW-10	0.0562	n/a	10/19/2020	0.002ND	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Selenium (mg/l)	MW-14	0.0562	n/a	10/19/2020	0.0118	No	40	57.5	n/a	0.02355	NP Inter (NDs)
Sulfate (mg/l)	MW-2A	213.5	n/a	10/19/2020	113	No	43	0	No	0.01	Param Inter
Sulfate (mg/l)	**MW-8A**	**213.5**	**n/a**	**10/19/2020**	**353**	**Yes**	**43**	**0**	**No**	**0.01**	**Param Inter**
Sulfate (mg/l)	MW-10	213.5	n/a	10/19/2020	143	No	43	0	No	0.01	Param Inter
Sulfate (mg/l)	MW-14	213.5	n/a	10/19/2020	181	No	43	0	No	0.01	Param Inter

APPENDIX B – GROUNDWATER SAMPLING FIELD DOCUMENTATION

5-27-20 98777 Bolling

0730 Arrive onsite, calibrate equipment
YSI pH 4.0 / 7.0 / 10.0
cal: 1.409
DO: 100%
ORP: 237.5
Turbidity 10.0, 100.0
0750 Set up at MW-15
wl - 17.25
0805 Air hose leaking offsite to field
car to get new hose
0835 Arrive at field
0930 Back onsite resume MW-15
1018 Collect MW-15/GW01 MS/MSD
for Appendix III + Select IV parameters
1106 Set up at MW-14
wl 16.23
1130 Collect MW-14/GW01 for Appendix III
+ Select IV parameters.
1150 Set up at ~~MW-10~~ MW-8A
wl - 19.73
1240 Collect MW-8A/GW01 for App. III +
Select IV parameters
1300 Set up at MW-10 wl - 19.01
1330 collect MW-10/GW01 DUP-1/GW01
App III + Select IV Parameters

5-27-20 98777 Bolling

1410 Set up at MW-2A wl - 16.29
1440 Collect MW-2A/GW01
for App III + Select IV parameters
1500 Set up to purge + sample MW-3
wl - 19.39
1540 Collect MW-3/GW01 for
App. III + select IV parameters
1610 Set up at MW-4 wl - 17.16
1645 Collect MW-4/GW01 for
App III + select IV parameters.
1710 K. Bolling offsite
1730 Buy ice for coolers

K Bolling 5-27-20

5-28-20 88777 Bollin

0755 Arrive onsite at MW-13
WL- 13.12
0800 Calibrate equipment
YSI: pH 4.0/7.0/10.0
cond 1.409
ORP: 237.5
DO: 100%
turbidity 9.97/10.0
99.4/100.0

0825 Begin purge MW-13
*** Note: seems to be a malfunction in pump at MW-13

~~0910~~ 0950 collect MW-13/GWO1 for App. III + select IV parameters

1020 Set up at MW-16, WL- 16.89
1055 Collect MW-16/GWO1 for App III + Select IV parameters
1155 Relinquish samples to Pace Wichita
1300 Arrive at the office

[signature] 5-28-20

-20 18-20 88777 [illegible]
[illegible] GW monitoring
Weather 40s, [illegible] NE [illegible]
Personnel: [illegible]
0615: Begin calibrating equipment
pH: 4.0/7.0/10.0 [illegible]
Cond: 1.409/1.409
ORP: 237.5/237.5
DO: [illegible]
turb: [illegible]
[illegible]
[illegible]
[illegible]
[illegible]

0850: Collect MW-8A/GWO2 for App. III + sel. App IV
0900: Meet Pace at gate for additional containers
0915: Set up @ MW-10
0920: begin purging MW-10
0955: Collect MW-10/GWO2 + Dup-1/GWO2 for App. III + select App. IV
1025: Set up @ MW-2A
1030: Begin purging MW-2A
1100: Collect MW-2A/GWO2, MS/MSD for App. III & IV
1125: Set up @ MW-3
1130: Begin purging MW-3
1205: Collect MW-3/GWO2 for App. III + select App. IV
1215: Set up @ MW-4

10-14-20 88497 Hermanson

1220: Begin purging MW-4

1250: Collect MW-4/GW02 for App. III + Sel. App IV

1320: Set up @ MW-13

1330: Begin purging MW-13

1515: Collect MW-13/GW02 for App. III & Sel. App IV

1535: Set up @ MW-16

1540: Begin purging MW-16

1615: Collect MW-16/GW02 for App. III & Sel. App. IV

1635: Set up @ MW-14

1640: Begin purging MW-14

1715: Collect MW-14/GW02 for App. III + Sel. App IV

1730: Clean up + organize for next day's work

1735: Off-site

10-14-20

10-20-20 88772 Hermanson

Task: GW monitoring

Weather: 40s, 5-10 mph NW, overcast

Personnel: Jonathan Hermanson

0630: Calibrate equipment

pH: 4.0/4 7.0/7 10.0/10

Con: 1.404 / 1.409

DO: 100.0%

ORP: 237.5

Turb: 8.37/0 10.43/10

0730: Depart for SPU building

0800: Meet R. Myer to pick up equip.

0830: Arrive @ Narmer Creek & check in w/ guard

0840: Set up @ MW-15

0850: Begin purging MW-15

0920: Collect MW-15/GW02 for App. III & Sel. IV

0930: Off-site to Quindaro

10-20-20

December 8, 2020 13777 Hermanson

Task: MW-8A GW sample

Weather: 60's, 5mph S, partly cloudy

Personnel: Jonathan Hermanson

1230: Arrive on-site & meet T. Burns BPU

1235: Calibrate equipment and set up

@ MW-8A: [illegible] pH [illegible] [illegible] [illegible] [illegible]

1305: Begin purging MW-8A

1500: Collect MW-8A for Arsenic by 6010 + 6020

1520: Offsite

Jonathan Hermanson

12-8-20

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Cloudy 74

WELL NUMBER: MW-14

DEPTH TO WATER (ft): 16.23 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1110	1	300	7.37	16.29	1.184	2.70	-24.9	1.36	16.24
1115	1.5	300	6.73	16.30	1.268	1.96	-18.0	0.94	16.26
1120	3	300	6.54	16.28	1.274	1.20	-13.3	0.85	16.26
1125	4.5	300	6.51	16.32	1.273	0.51	-10.9	0.81	16.26
1130	6	300	6.49	16.31	1.271	0.46	-8.4	0.76	16.26
	2.5								

Continued on additional page ☐ Yes ☒ No

SAMPLING Equipment Used: ~~Nondedicated~~ Dedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1130	6	6.49	16.31	1.271	0.46	-8.4	0.76	16.26	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 16.26 TIME FINAL DEPTH TAKEN: 1144

SAMPLE ID: MW-14/GW01 SAMPLE ID FOR QC: -

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs

☐ RCRA 8 METALS ☐ Cyanide

☐ Others

IDW TOTAL: 2 gal Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Mostly cloudy 68°

WELL NUMBER: MW-15

DEPTH TO WATER (ft): 17.25 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft): —

DEPTH TO TOP OF PUMP (ft): 30 (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: — Gallons per Casing Volume:

Gallons per foot: —

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity 1.092 (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0938	1	300	7.68	12.51	~~12.3~~	55	69.7	11.52	17.25
0943	1.5	300	7.72	9.96	0.786	18.1	82.4	3.56	17.25
0948	3	300	7.45	10.06	0.785	19.2	75.5	3.05	17.25
0953	4.5	300	7.43	9.72	0.785	13.21	64.0	2.81	17.25
0958	6	300	7.65	9.82	0.785	8.111	40.9	2.52	17.25
1003	7.5	300	7.84	9.86	0.785	6.124	26.2	2.41	17.25
1008	9	300	7.95	9.91	0.785	3.603	9.0	2.38	17.25
1013	10.5	300	7.92	9.90	0.786	3.01	9.0	2.25	17.25
1018	12	300	7.88	9.94	0.784	2.86	6.4	2.23	17.25

Continued on additional page ☐ Yes ☒ No

SAMPLING Equipment Used: ~~Nondedicated~~ Dedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1019	12	7.89	9.94	0.784	2.86	6.4	2.23	17.25	—

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 17.25 TIME FINAL DEPTH TAKEN: 1050

SAMPLE ID: MW-12 SAMPLE ID FOR QC: MW-15/MS

MW-15 MSD

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 3 gal Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Pt Sunny 75°

WELL NUMBER: MW-10

DEPTH TO WATER (ft): 14.01 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft): —

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: — Gallons per Casing Volume:

Gallons per foot: —

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1310	1	300	6.22	14.93	1.122	22.9	-26.0	1.05	14.04
1315	1.5	300	6.21	14.84	1.132	16.2	-20.9	0.89	14.04
1320	3	300	6.23	14.71	1.132	10.4	-17.8	0.80	14.04
1325	4.5	300	6.24	14.65	1.128	7.2	-16.7	0.71	14.04
1330	6	300	6.25	14.72	1.126	4.3	-14.2	0.64	14.04
	7.5	300							

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: Nondedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1330	6	6.24	14.72	1.126	4.3	-14.3	0.64	14.04	—

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 14.04 TIME FINAL DEPTH TAKEN: ~~1315~~ 1405

SAMPLE ID: MW-10/GW01 SAMPLE ID FOR QC: DUP-1/GW01

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 1.5 Flow Through Cell Model Number: ~~555~~

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Pt cloudy 75°

WELL NUMBER: MW-2A

DEPTH TO WATER (ft): 16.28 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1420	1	300	6.30	15.29	0.823	23.7	6.4	6.41	16.32
1425	1.5	300	6.32	15.12	0.820	16.1	8.4	1.43	16.40
1430	3	300	6.31	14.97	0.819	10.63	9.0	1.27	16.48
1435	4.5	300	6.31	14.94	0.819	4.77	9.1	1.24	16.48
1440	6	300	~~6.38~~	14.97	0.819	3.96	5.7	1.17	16.48
	7.5	300							

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: Nondedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1440	6	6.38	14.97	0.819	3.96	5.7	1.17	16.48	—

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 16.48 TIME FINAL DEPTH TAKEN: 1500

SAMPLE ID: MW-2A/GW01 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs

☐ RCRA 8 METALS ☐ Cyanide

☐ Others

IDW TOTAL: 2 Flow Through Cell Model Number: 554

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Sopl Cloudy 78°

WELL NUMBER: MW-8A

DEPTH TO WATER (ft): 9.73 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft): —

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1215	1	300	6.71	16.18	1.012	45.1	27.8	0.97	19.84
1220	1.5	300	6.61	16.02	0.984	22.4	6.4	0.65	19.81
1225	3	300	6.64	16.12	0.985	13.6	-2.8	0.61	19.90
1230	4.5	300	6.67	15.98	0.991	8.2	-10.6	0.60	19.90
1235	6	300	6.63	15.94	0.990	5.9	-14.0	0.54	19.90
1240	7.5	300	6.62	15.97	0.991	4.8	-23.1	0.56	19.90

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: Nondedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1240	7.5	6.62	15.97	0.991	4.8	-23.1	0.56	19.90	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 19.90 TIME FINAL DEPTH TAKEN: 1258

SAMPLE ID: ~~MW-10/GW01~~ MW-8A/GW01 SAMPLE ID FOR QC: ~~DUP-1/GW01~~ KM

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 2 gal Flow Through Cell Model Number:

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Mostly clear, 80

WELL NUMBER: MW-3

DEPTH TO WATER (ft): 19.39 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1510	1	300	6.62	16.45	0.883	62.5	-9.7	1.44	19.44
1515	1.5	300	6.25	15.51	0.891	38.6	10.7	1.43	19.44
1520	3	300	6.19	15.64	0.896	19.7	16.6	1.43	19.44
1525	4.5	300	6.24	15.72	0.900	12.4	18.1	1.33	19.44
1530	6	300	6.28	15.69	0.899	8.6	17.8	1.32	19.44
1535	7.5	300	6.27	15.76	0.898	6.2	18.2	1.31	19.44
1540	9.0	300	6.30	15.73	0.897	4.5	20.0	1.27	19.44

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: Nondedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1540	9.0	6.30	15.73	0.894	4.5	20.0	1.27	19.44	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 19.44 TIME FINAL DEPTH TAKEN: 1600

SAMPLE ID: MW-3/GW01 SAMPLE ID FOR QC: \

\

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs

☐ RCRA 8 METALS ☐ Cyanide

☐ Others

IDW TOTAL: 25 Flow Through Cell Model Number: SC6

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Partly Cloudy 80°

WELL NUMBER: MW-4

DEPTH TO WATER (ft): 16.16 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1620	1	300	6.82	16.15	0.810	18.11	16.2	3.27	16.16
1625	1.5	300	6.19	15.09	0.786	12.36	34.7	2.28	16.19
1630	3	300	6.31	14.62	0.762	8.41	45.2	1.78	16.21
1635	4.5	300	6.25	14.62	0.755	6.17	48.5	1.52	16.21
1640	6	300	6.32	14.54	0.754	5.10	47.4	1.48	16.21
1645	7.5	300	6.35	15.59	0.753	4.62	48.1	1.46	16.21

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: Nondedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1645	7.5	6.35	15.59	0.753	4.62	48.1	1.46	16.21	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 16.21 TIME FINAL DEPTH TAKEN: 1705

SAMPLE ID: MW-4/GW0 SAMPLE ID FOR QC:

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 2 Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-28-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Cloudy 66 Rain

WELL NUMBER: MW-13

DEPTH TO WATER (ft): 13.17 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0845	1	200	6.06	15.17	0.913	374	-25.8	1.58	13.17
0850	1	200	6.02	15.14	0.911	675	-41.7	1.16	13.17
0855	2	200	6.25	15.19	0.910	408	-55.2	0.99	13.17
0900	3	200	6.43	15.31	0.915	361	-69.2	0.94	13.17
0905	4	200	6.40	15.42	0.915	224	-71.2	0.95	13.17
0910	5	200	6.31	15.21	0.911	72.7	-71.6	0.82	13.17
0915	6	200	6.26	15.16	0.909	39.6	-71.9	0.73	13.17
0920	7	200	6.39	15.24	0.909	31.1	-80.0	0.68	13.17
0925	8	200	6.47	15.26	0.909	28.6	-85.1	0.61	13.17
0930	9	200	6.45	15.23	0.909	26.1	-87.5	0.59	13.17
0935	10	200	6.49	15.25	0.904	19.2	-90.2	0.55	13.17
0940	11	200	6.44	15.12	0.908	10.6	-88.0	0.61	13.17
0945	12	200	6.44	15.09	0.909	7.1	-89.2	0.56	13.17
0950	13	200	6.45	15.04	0.908	4.9	-90.4	0.54	13.17

Continued on additional page ☐ Yes ☐ No

SAMPLING Equipment Used: ~~Non~~dedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0950	13	6.45	15.04	0.908	4.9	-90.4	0.54	13.12	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 13.12 TIME FINAL DEPTH TAKEN: 1010

SAMPLE ID: MW-13/GW01 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 3.5 gal Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-28-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-28-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: WEATHER: Cloudy, 70°, Scattered showers.

WELL NUMBER: MW-16

DEPTH TO WATER (ft): 16.85 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1030	1	300	7.60	14.38	1.012	51.5	-52.8	1.10	16.89
1035	1.5	300	6.48	14.22	0.988	9.79	-45.1	0.59	16.94
1040	3	300	6.43	14.28	0.986	7.21	-49.1	0.61	16.94
1045	4.5	300	6.57	14.22	0.983	4.86	-58.0	0.55	16.94
1050	6	300	6.57	14.22	0.981	4.07	-61.1	0.49	16.94
1055	7.5	300	6.58	14.21	0.981	3.81	-61.8	0.52	16.94

Continued on additional page ☐ Yes ☒ No

SAMPLING Equipment Used: ~~Non~~dedicated Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1055	7.5	6.58	14.21	0.981	3.81	-61.8	0.52	16.94	—

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 16.94 TIME FINAL DEPTH TAKEN: 11:15

SAMPLE ID: MW-16/GW01 SAMPLE ID FOR QC:

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 2 gal Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-28-20
REVIEWED:			

FIELD GROUNDWATER SAMPLING DATA FORM

DATE: 5-27-20 SITE: KCBPU PID READING at WELL HEAD (ppm): NA

PROJECT NUMBER: 88777 WEATHER: Cloudy 74

WELL NUMBER: MW-14

DEPTH TO WATER (ft): 16.23 WELL DIAMETER (inches): 2

TOTAL DEPTH (ft): DEPTH TO TOP OF YSI (ft):

DEPTH TO TOP OF PUMP (ft): (for downhole DO measurement)

PURGING

CASING VOLUME CALCULATION:

Height of Water Column: Gallons per Casing Volume:

Gallons per foot:

Equipment Used: Other

Time (24 hr)	Amount Purged L	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1110	1	300	7.37	16.29	1.18	2.70	-24.9	1.36	16.26
1115	1.5	300	6.73	16.30	1.268	1.96	-18.0	0.94	16.26
1120	3	300	6.54	16.28	1.274	1.20	-13.3	0.85	16.26
1125	4.5	300	6.51	16.32	1.273	0.51	-10.9	0.81	16.26
1130	6	300	6.49	16.31	1.271	0.46	-8.4	0.76	16.26
	25								

Continued on additional page ☐ Yes ☒ No

SAMPLING Equipment Used: ~~Nondedicated~~ Bladder Pump

Sample Time (24 hr)	Total Purged (Liters)	pH	Temp (C)	Conductivity (mS/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1130	6	6.49	16.31	1.271	0.46	-8.4	0.76	16.26	

FERROUS IRON: NA mg/L

FINAL DEPTH TO WATER (ft TOC): 16.26 TIME FINAL DEPTH TAKEN: 1144

SAMPLE ID: MW-14/GW01 SAMPLE ID FOR QC: -

-

PARAMETERS REQUESTED FOR ANALYSIS: ☐ BTEX ☐ PAHs ☐ RCRA 8 METALS ☐ Cyanide ☐ Others

IDW TOTAL: 2 gal Flow Through Cell Model Number: 556

	NAME	SIGNATURE	DATE
PREPARED:	Kevin Bolling		5-27-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 5 mph NE, overcast

WELL NUMBER

MW-2A

DEPTH TO WATER (ft): 22.46

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1030	—	300	6.85	12.50	0.822	22.7	-32.4	4.17	22.46
1035	0.40	300	6.80	12.99	0.889	11.4	-21.6	1.20	22.46
1040	0.80	300	6.80	13.17	0.905	8.66	-19.7	0.92	22.46
1045	1.20	300	6.79	13.19	0.907	2.51	-23.5	0.27	22.46
1050	1.60	300	6.79	13.24	0.905	1.56	-28.2	0.18	22.46
1055	2.00	300	6.79	13.25	0.900	1.67	-31.4	0.17	22.46
Continued on back (circle one) yes (no)									

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1100	2.00	6.79	13.25	0.900	1.67	-31.4	0.17	22.46	—

FINAL DEPTH TO WATER (ft TOC): 22.46 TIME FINAL DEPTH TAKEN: 1100

SAMPLE ID: MW-2A/6002 SAMPLE ID FOR QC: MW-2A/6002-MS/MSD

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.00

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 5mph NE, overcast

WELL NUMBER

MW-3

DEPTH TO WATER (ft): 24.73

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1130	-	300	6.65	13.48	1.027	2.96	-66.7	7.48	24.73
1135	0.40	300	6.64	13.50	1.045	2.04	-77.9	1.61	24.73
1140	0.80	300	6.64	13.53	1.064	1.37	-94.8	0.67	24.92
1145	1.20	300	6.64	13.49	1.063	1.44	-118.1	0.57	24.92
1150	1.60	300	6.65	13.56	1.056	1.65	-135.8	0.52	24.92
1155	2.00	300	6.65	13.58	1.051	1.51	-146.0	0.47	24.92
1200	2.40	300	6.65	13.54	1.048	1.13	-139.5	0.49	24.92

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1205	2.40	6.65	13.54	1.048	1.13	-139.5	0.49	24.92	—

FINAL DEPTH TO WATER (ft TOC): 24.92 TIME FINAL DEPTH TAKEN: 1205

SAMPLE ID: MW-3/GW02 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.40 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): -

PROJECT NUMBER: 88777 WEATHER: 40s, 5 mph NE, overcast

WELL NUMBER

MW-41

DEPTH TO WATER (ft): 21.57

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1220	-	300	6.86	13.84	0.707	1.72	-130.7	3.93	21.57
1225	0.40	300	6.86	13.83	0.702	1.74	-147.1	1.43	21.51
1230	0.80	300	6.85	13.87	0.701	1.72	-134.9	1.21	21.51
1235	1.20	300	6.85	13.88	0.700	1.44	-135.3	1.13	21.51
1240	1.60	300	6.85	13.92	0.699	1.21	-134.1	1.02	21.51
1245	2.00	300	6.85	13.95	0.699	0.69	-130.9	0.96	21.51

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1250	1.60	6.85	13.92	0.699	0.69	-130.9	0.96		-

FINAL DEPTH TO WATER (ft TOC): 21.51 TIME FINAL DEPTH TAKEN: 1250

SAMPLE ID: MW-41GW02 SAMPLE ID FOR QC: -

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): - IDW TOTAL: 2.00 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 10 mph N, overcast

WELL NUMBER

MW-8A

DEPTH TO WATER (ft): 25.92

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0755	—	300	6.90	14.30	1.182	98.0	-69.2	3.16	25.92
0800	0.40	300	6.94	14.00	1.249	95.7	-79.8	1.18	26.10
0805	0.80	300	6.94	14.05	1.256	52.5	-94.5	0.60	26.18
0810	1.20	300	6.94	14.28	1.264	25.9	-105.9	0.50	26.26
0815	1.60	300	6.93	14.47	1.268	13.4	-119.9	0.45	26.29
0820	2.00	300	6.92	14.49	1.270	14.83	-128.7	0.46	26.29
0825	2.40	300	6.92	14.49	1.271	15.4	-134.1	0.41	26.29
0830	2.80	300	6.91	14.47	1.272	13.25	-138.0	0.32	26.29
0835	3.20	300	6.91	14.44	1.272	6.37	-141.7	0.24	26.29
Continued on back (circle one) (yes) / no									

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0850	4.00	6.90	14.54	1.272	4.48	-131.8	0.21	26.29	—

FINAL DEPTH TO WATER (ft TOC): 26.29 TIME FINAL DEPTH TAKEN: 0850

SAMPLE ID: MW-8A SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 4.00

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

WELL NUMBER

MW-8A

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0840	3.60	300	6.91	14.51	1.272	~~130~~ 6.18	-130.6	0.23	26.29
0845	4.00	300	6.90	14.54	1.272	4.48	-131.8	0.21	26.79

COMMENTS

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 10mph NE, Overcast

WELL NUMBER

MW-10

DEPTH TO WATER (ft): 20.40

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: (Dedicated Bladder Pump) Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0920	~~5.00~~	300	6.74	13.90	1.024	47.8	23.2	3.94	20.40
0925	0.40	300	6.70	13.94	1.028	40.8	23.1	1.42	20.40
0930	0.80	300	6.72	14.06	1.027	24.1	16.0	0.55	20.40
0935	1.20	300	6.71	14.08	1.026	19.9	-7.1	0.39	20.40
0940	1.60	300	6.70	14.05	1.026	12.6	-13.9	0.38	20.40
0945	2.00	300	6.70	14.07	1.026	6.22	-13.3	0.26	20.40
0950	2.40	300	6.70	14.09	1.026	2.40	-15.0	0.24	20.40

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: (Same as above) Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0955	2.40	6.70	14.09	1.024	2.40	-15.0	0.24	20.40	—

FINAL DEPTH TO WATER (ft TOC): 20.40 TIME FINAL DEPTH TAKEN: 0955

SAMPLE ID: MW-10 SAMPLE ID FOR QC: Dup-1

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.40

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: X COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 5mph N, Overcast

WELL NUMBER: MW-13

DEPTH TO WATER (ft): 20.81

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1330	—	300	6.78	13.98	1.029	error	-88.4	1.98	20.81
1335	0.40	300	6.79	14.05	1.073	error	-112.3	0.47	20.81
1340	0.80	300	6.79	14.02	1.079	48.2	-125.4	0.24	20.81
1345	1.20	300	6.79	14.06	1.078	38.7	-130.5	0.18	20.81
1350	1.60	300	6.79	14.10	1.078	26.6	-137.2	0.16	20.81
1355	2.00	300	6.79	14.15	1.077	19.5	-138.7	0.13	20.81
1400	2.40	300	6.78	14.15	1.077	17.1	-140.8	0.12	20.81
1405	2.80	300	6.78	14.16	1.075	14.5	-143.5	0.14	20.81
1410	3.20	300	6.78	14.14	1.076	12.3	-145.6	0.11	20.81

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1515	8.00	6.77	14.03	1.065	4.94	-125.2	0.09	20.8	—

FINAL DEPTH TO WATER (ft TOC): 20.81 TIME FINAL DEPTH TAKEN: 1515

SAMPLE ID: MW-13 | GW07 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 8.00 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-19-20
REVIEWED:			

WELL NUMBER

MW-13

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1415	3.60	300	6.78	14.11	1.075	19.1	-145.2	0.09	20.81
1420	4.00	300	6.78	14.06	1.073	22.8	-145.6	0.10	20.81
1425	4.40	300	6.78	14.06	1.072	18.0	-144.1	0.12	20.81
1430	4.80	300	6.80	14.12	1.070	15.0	-141.7	0.11	20.81
1435	5.20	300	6.78	14.11	1.070	14.58	-141.6	0.11	20.81
1440	5.60	300	6.78	14.06	1.068	10.82	-140.1	0.09	20.81
1445	6.00	300	6.78	14.09	1.072	11.62	-120.9	0.09	20.81
1450	6.40	300	6.78	14.11	1.071	9.87	-119.3	0.10	20.81
1455	6.80	300	6.78	14.12	1.069	8.96	-114.7	0.09	20.81
1500	7.20	300	6.77	14.07	1.068	7.07	-120.1	0.08	20.81
1505	7.60	300	6.77	14.07	1.067	6.00	-123.1	0.07	20.81
1510	8.00	300	6.77	14.03	1.065	4.94	-125.2	0.09	20.81

COMMENTS

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-14-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, no wind, overcast

WELL NUMBER

MW-14

DEPTH TO WATER (ft): 25.78

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1640	-	300	6.82	15.29	1.107	6.09	7.0	5.39	25.78
1645	0.40	300	6.62	15.47	1.183	4.15	35.8	1.85	25.78
1650	0.80	300	6.60	15.64	1.199	1.78	47.1	0.72	25.78
1655	1.20	300	6.60	15.68	1.204	1.22	52.6	0.34	25.78
1700	1.60	300	6.60	15.69	1.205	1.03	55.7	0.24	25.78
1705	2.00	300	6.59	15.73	1.205	0.66	56.4	0.20	25.78

Continued on back (circle one) yes / no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1710	2.00	6.59	15.73	1.205	0.66	56.4	0.20	25.78	-

FINAL DEPTH TO WATER (ft TOC): 25.78 TIME FINAL DEPTH TAKEN: 1710

SAMPLE ID: MW-14/GW02 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.00 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jon Herm	10-15-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-20-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 5mph W, overcast

WELL NUMBER

MW-15

DEPTH TO WATER (ft): 26.42

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0850	-	300	6.92	17.39	0.763	6.08	-83.8	5.40	26.42
0855	0.40	300	7.27	18.81	0.788	36.3	-90.6	0.93	26.42
0900	0.80	300	7.29	18.69	0.793	22.1	-87.0	0.49	26.42
0905	1.20	300	7.28	18.62	~~0.793~~ 0.793	11.1	-83.2	0.43	26.42
0910	1.60	300	7.28	18.66	0.794	5.29	-85.8	0.34	26.42
0915	2.00	300	7.28	18.69	0.794	4.89	-85.4	0.32	26.42

Continued on back (circle one) yes / (no)

SAMPLING Equipment Used: ~~Same as above~~ Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0920	2.00	7.28	18.69	0.794	4.89	-85.4	0.32	26.42	—

FINAL DEPTH TO WATER (ft TOC): 26.42 TIME FINAL DEPTH TAKEN: 0920

SAMPLE ID: MW-15/GWD2 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.00 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jon Hermanson	10-20-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 10-19-20 SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 40s, 5mph N, overcast

WELL NUMBER

MW-16

DEPTH TO WATER (ft): 22.05

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1535	-	300	6.62	13.59	1.150	45.4	-62.4	2.14	22.05
1540	0.40	300	6.61	13.81	1.197	27.9	-79.1	1.06	22.05
1545	0.80	300	6.60	13.83	1.208	14.6	-90.4	0.72	22.05
1550	1.20	300	6.59	13.85	1.210	11.4	-89.7	0.64	22.05
1555	1.60	300	6.59	13.85	1.215	7.83	-93.0	0.53	22.05
1600	2.00	300	6.59	13.84	1.216	6.56	-99.3	0.54	22.05
1605	2.40	300	6.59	13.86	1.216	5.80	-101.3	0.52	22.05
1610	2.80	300	6.59	13.89	1.215	4.11	-103.1	0.50	22.05
Continued on back (circle one) yes / no									

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1615	2.80	6.59	13.89	1.215	4.11	-103.1	0.50	22.05	—

FINAL DEPTH TO WATER (ft TOC): 22.05 TIME FINAL DEPTH TAKEN: 1615

SAMPLE ID: MW-16/GW02 SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Appendix III and select Appendix IV parameters

FERROUS IRON (mg/L): — IDW TOTAL: 2.80 gal

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermanson	Jonathan Hermanson	10-22-20
REVIEWED:			

FIELD GROUND-WATER SAMPLING REPORT

DATE: 12-08-20 SITE: KCBPH- Newman PID READING at WELL HEAD (ppm): —

PROJECT NUMBER: 88777 WEATHER: 60's, 5mph S-W, partly cloudy

WELL NUMBER

MW-8A

DEPTH TO WATER (ft): 27.25

TOTAL DEPTH (ft): _____ WELL DIAMETER (inches): 2

PURGING

CASING VOLUME CALCULATION: ____ ft of water X ____ gallons/ = ____ total gallons/casing volume
in casing foot

Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other _____

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1305	-	300	6.81	16.03	1.361	47	-15.7	2.65	27.25
1310	0.40	300	6.74	15.93	1.330	16	-87.7	1.33	27.36
1315	0.80	300	6.78	15.86	1.311	7	-103.5	1.13	27.95
1320	1.20	300	6.78	15.85	1.309	3.47	-110.5	1.03	27.95
1325	1.60	300	6.81	15.85	1.307	2.96	-121.2	0.89	27.95
1330	2.00	300	6.84	15.83	1.304	2.14	-127.4	0.81	27.45
1335	2.40	300	6.88	15.81	1.298	0.33	-132.7	0.74	27.95
1340	2.80	300	6.88	15.79	1.291	0.49	-134.4	0.70	27.95
1345	3.20	300	6.88	15.79	1.286	0.63	-135.7	0.67	27.95

Continued on back (circle one) (yes) no

SAMPLING Equipment Used: Same as above Other _____

Sample Time (24 hr)	Total Purged (gals)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1500	3.80	6.87	15.76	1.255	0.28	-135.6	0.42	27.95	-

FINAL DEPTH TO WATER (ft TOC): 27.95 TIME FINAL DEPTH TAKEN: 1455

SAMPLE ID: MW-8A SAMPLE ID FOR QC: —

PARAMETERS REQUESTED FOR ANALYSIS: Arsenic by 6010 & 6020

FERROUS IRON (mg/L): — IDW TOTAL: _____

METER MODEL No.: YSI 556 MPS

CHECKED FLOW THROUGH CELL FOR LEAKS: ☒ COMMENTS: N/A

	NAME	SIGNATURE	DATE
PREPARED:	Jonathan Hermansen	Jonathan Hermansen	12-08-20
REVIEWED:			

WELL NUMBER

MW-8A

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1350	3.60	300	6.88	15.77	1.282	0.02	-136.6	6.64	27.95
1355	4.00	300	6.88	15.75	1.280	0.96	-137.2	0.61	27.95
1400	4.40	300	6.89	15.72	1.275	0.02	-137.5	0.58	27.95
1405	4.80	300	6.90	15.67	1.271	0.04	-137.6	0.55	27.95
1410	5.20	300	6.90	15.67	1.268	0.19	-137.3	0.53	27.95
1415	5.60	300	6.90	15.67	1.266	0.47	-137.4	0.52	27.95
1420	6.00	300	6.90	15.66	1.264	0.26	-136.7	0.50	27.95
1425	6.40	300	6.90	15.67	1.261	0.02	-137.0	0.49	27.95
1430	6.80	300	6.91	15.67	1.259	5.07	-136.7	0.48	27.95
1435	7.20	300	6.91	15.69	1.260	41.29	-136.6	0.45	27.95
1440	7.60	300	6.92	15.68	1.257	1.74	-136.4	0.44	27.95
1445	8.00	300	6.92	15.72	1.256	0.78	-134.8	0.44	27.95
1450	8.40	300	6.92	15.76	1.256	0.49	-135.4	0.43	27.95
1455	8.80	300	6.87	15.76	1.255	0.38	-135.6	0.42	27.95

COMMENTS

APPENDIX C – ANALYTICAL REPORTS AND DATA VALIDATION

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 15, 2020

Kansas City Board of Public Utilities

Sample Delivery Group:	L1223308
Samples Received:	05/29/2020
Project Number:	KCBPU Nearman
Description:	GW-Creek Bottom Ash Pond
Report To:	Ingrid Setzler
	300 N 65th Street
	Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman

Linda Cashman
Project Manager

MW-2A/GW01 L1223308-01 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 14:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/01/20 20:43	06/01/20 20:43	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 10:58	06/02/20 10:58	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:06	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484995	1	06/02/20 13:17	06/03/20 20:21	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:48	LAT	Mt. Juliet, TN

MW-3/GW-01 L1223308-02 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 15:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:19	06/01/20 21:19	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 11:33	06/02/20 11:33	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:08	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:51	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:51	LAT	Mt. Juliet, TN

MW-4/GW-01 L1223308-03 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 16:45 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:37	06/01/20 21:37	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:10	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:53	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:55	LAT	Mt. Juliet, TN

MW-8A/GW-01 L1223308-04 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 12:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/01/20 21:55	06/01/20 21:55	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 11:51	06/02/20 11:51	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:18	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:56	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:58	LAT	Mt. Juliet, TN

MW-10/GW-01 L1223308-05 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 13:30 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484440	1	06/01/20 18:00	06/01/20 18:00	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/01/20 22:13	06/01/20 22:13	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/01/20 23:52	06/01/20 23:52	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:20	TCT	Mt. Juliet, TN

MW-10/GW-01 L1223308-05 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 13:30 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:59	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:17	LAT	Mt. Juliet, TN

MW-13/GW-01 L1223308-06 GW

Collected by: Kevin Bolling | Collected date/time: 05/28/20 09:50 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1486263	1	06/04/20 15:58	06/04/20 16:34	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 00:09	06/02/20 00:09	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 00:27	06/02/20 00:27	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:22	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:06	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:20	LAT	Mt. Juliet, TN

MW-14/GW-01 L1223308-07 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 11:30 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 00:45	06/02/20 00:45	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 01:03	06/02/20 01:03	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:24	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:09	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:24	LAT	Mt. Juliet, TN

MW-15/GW-01 L1223308-08 GW

Collected by: Kevin Bolling | Collected date/time: 05/27/20 10:18 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1485691	1	06/04/20 18:26	06/04/20 18:26	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 01:21	06/02/20 01:21	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 02:15	06/02/20 02:15	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:00	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 17:40	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 12:34	LAT	Mt. Juliet, TN

MW-16/GW-01 L1223308-09 GW

Collected by: Kevin Bolling | Collected date/time: 05/28/20 10:55 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1486263	1	06/04/20 15:58	06/04/20 16:34	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 02:32	06/02/20 02:32	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 12:09	06/02/20 12:09	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:25	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:12	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:27	LAT	Mt. Juliet, TN

DUP-1/GW-01 L1223308-10 GW

Collected by: Kevin Bolling
Collected date/time: 05/27/20 00:00
Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1485978	1	06/03/20 18:13	06/03/20 20:06	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1484441	1	05/30/20 12:00	05/30/20 12:00	KPS	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	1	06/02/20 03:44	06/02/20 03:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1484939	5	06/02/20 12:27	06/02/20 12:27	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1484474	1	06/01/20 20:42	06/02/20 19:27	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1484996	1	06/02/20 09:53	06/03/20 18:15	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1485005	1	06/02/20 09:57	06/02/20 13:30	LAT	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 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.

Linda Cashman
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	545		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.73	T8	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-01 WG1485691: 7.73 at 22.5C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	14.0		1.00	1	06/01/2020 20:43	WG1484939
Fluoride	0.278		0.150	1	06/01/2020 20:43	WG1484939
Sulfate	110		25.0	5	06/02/2020 10:58	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:06	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.143		0.00500	1	06/03/2020 20:21	WG1484995
Beryllium	ND		0.00200	1	06/03/2020 20:21	WG1484995
Boron	ND		0.200	1	06/03/2020 20:21	WG1484995
Cadmium	ND		0.00200	1	06/03/2020 20:21	WG1484995
Calcium	137		1.00	1	06/03/2020 20:21	WG1484995
Chromium	ND		0.0100	1	06/03/2020 20:21	WG1484995
Cobalt	ND		0.0100	1	06/03/2020 20:21	WG1484995
Lithium	0.0172		0.0150	1	06/03/2020 20:21	WG1484995
Molybdenum	ND		0.00500	1	06/03/2020 20:21	WG1484995

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:48	WG1485005
Arsenic	0.00420		0.00200	1	06/02/2020 12:48	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:48	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:48	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:48	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	609		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.09	T8	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-02 WG1484441: 7.09 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.33		1.00	1	06/01/2020 21:19	WG1484939
Fluoride	0.191		0.150	1	06/01/2020 21:19	WG1484939
Sulfate	106		25.0	5	06/02/2020 11:33	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:08	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.151		0.00500	1	06/03/2020 17:51	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:51	WG1484996
Boron	ND		0.200	1	06/03/2020 17:51	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:51	WG1484996
Calcium	153		1.00	1	06/03/2020 17:51	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:51	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:51	WG1484996
Lithium	0.0421		0.0150	1	06/03/2020 17:51	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:51	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:51	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 12:51	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:51	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:51	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:51	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	488		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.41	T8	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-03 WG1485691: 7.41 at 22.4C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	7.45		1.00	1	06/01/2020 21:37	WG1484939
Fluoride	ND		0.150	1	06/01/2020 21:37	WG1484939
Sulfate	36.3		5.00	1	06/01/2020 21:37	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:10	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.140		0.00500	1	06/03/2020 17:53	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:53	WG1484996
Boron	ND		0.200	1	06/03/2020 17:53	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:53	WG1484996
Calcium	125		1.00	1	06/03/2020 17:53	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:53	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:53	WG1484996
Lithium	0.0281		0.0150	1	06/03/2020 17:53	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:53	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:55	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 12:55	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:55	WG1485005
Selenium	0.00289		0.00200	1	06/02/2020 12:55	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:55	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	689		13.3	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.64	T8	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-04 WG1485691: 7.64 at 22.7C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	27.2		1.00	1	06/01/2020 21:55	WG1484939
Fluoride	0.428		0.150	1	06/01/2020 21:55	WG1484939
Sulfate	285		25.0	5	06/02/2020 11:51	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:18	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.147		0.00500	1	06/03/2020 17:56	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:56	WG1484996
Boron	2.24		0.200	1	06/03/2020 17:56	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:56	WG1484996
Calcium	99.8		1.00	1	06/03/2020 17:56	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:56	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:56	WG1484996
Lithium	0.0195		0.0150	1	06/03/2020 17:56	WG1484996
Molybdenum	0.0111		0.00500	1	06/03/2020 17:56	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:58	WG1485005
Arsenic	0.0197		0.00200	1	06/02/2020 12:58	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:58	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:58	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:58	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	761		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.99	T8	1	06/01/2020 18:00	WG1484440

Sample Narrative:

L1223308-05 WG1484440: 6.99 at 21.1C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.86		1.00	1	06/01/2020 22:13	WG1484939
Fluoride	0.162		0.150	1	06/01/2020 22:13	WG1484939
Sulfate	138		25.0	5	06/01/2020 23:52	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:20	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.129		0.00500	1	06/03/2020 17:59	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:59	WG1484996
Boron	1.17		0.200	1	06/03/2020 17:59	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:59	WG1484996
Calcium	173		1.00	1	06/03/2020 17:59	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:59	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:59	WG1484996
Lithium	0.0400		0.0150	1	06/03/2020 17:59	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:59	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:17	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:17	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:17	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:17	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:17	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	637	J4	10.0	1	06/04/2020 16:34	WG1486263

Sample Narrative:

L1223308-06 WG1486263: reran OOH confirmed initial results

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.40	T8	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-06 WG1485691: 7.4 at 22.4C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.2		1.00	1	06/02/2020 00:09	WG1484939
Fluoride	0.375		0.150	1	06/02/2020 00:09	WG1484939
Sulfate	146		25.0	5	06/02/2020 00:27	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:22	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.285		0.00500	1	06/03/2020 18:06	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:06	WG1484996
Boron	ND		0.200	1	06/03/2020 18:06	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:06	WG1484996
Calcium	125		1.00	1	06/03/2020 18:06	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:06	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:06	WG1484996
Lithium	0.0336		0.0150	1	06/03/2020 18:06	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:06	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:20	WG1485005
Arsenic	0.0240		0.00200	1	06/02/2020 13:20	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:20	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:20	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:20	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	915		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.12	T8	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-07 WG1484441: 7.12 at 21C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	22.1		1.00	1	06/02/2020 00:45	WG1484939
Fluoride	0.220		0.150	1	06/02/2020 00:45	WG1484939
Sulfate	253		25.0	5	06/02/2020 01:03	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:24	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.129		0.00500	1	06/03/2020 18:09	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:09	WG1484996
Boron	ND		0.200	1	06/03/2020 18:09	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:09	WG1484996
Calcium	200		1.00	1	06/03/2020 18:09	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:09	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:09	WG1484996
Lithium	0.0273		0.0150	1	06/03/2020 18:09	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:09	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:24	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:24	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:24	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:24	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:24	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	521		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.80	T8	1	06/04/2020 18:26	WG1485691

Sample Narrative:

L1223308-08 WG1485691: 7.8 at 22.2C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.8		1.00	1	06/02/2020 01:21	WG1484939
Fluoride	0.208		0.150	1	06/02/2020 01:21	WG1484939
Sulfate	218		25.0	5	06/02/2020 02:15	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:00	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.0977		0.00500	1	06/03/2020 17:40	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 17:40	WG1484996
Boron	ND		0.200	1	06/03/2020 17:40	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 17:40	WG1484996
Calcium	78.8		1.00	1	06/03/2020 17:40	WG1484996
Chromium	ND		0.0100	1	06/03/2020 17:40	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 17:40	WG1484996
Lithium	0.0405		0.0150	1	06/03/2020 17:40	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 17:40	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 12:34	WG1485005
Arsenic	0.00227		0.00200	1	06/02/2020 12:34	WG1485005
Lead	ND		0.00500	1	06/02/2020 12:34	WG1485005
Selenium	ND		0.00200	1	06/02/2020 12:34	WG1485005
Thallium	ND		0.00200	1	06/02/2020 12:34	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Dissolved Solids	747	J4	13.3	1	06/04/2020 16:34	WG1486263

Sample Narrative:

L1223308-09 WG1486263: Reran OOH confirmed initial results

Wet Chemistry by Method 9040C

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	6.88	T8	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-09 WG1484441: 6.88 at 20.7C

Wet Chemistry by Method 9056A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Chloride	11.7		1.00	1	06/02/2020 02:32	WG1484939
Fluoride	ND		0.150	1	06/02/2020 02:32	WG1484939
Sulfate	121		25.0	5	06/02/2020 12:09	WG1484939

Mercury by Method 7470A

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Mercury	ND		0.000200	1	06/02/2020 19:25	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Barium	0.245		0.00500	1	06/03/2020 18:12	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:12	WG1484996
Boron	ND		0.200	1	06/03/2020 18:12	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:12	WG1484996
Calcium	183		1.00	1	06/03/2020 18:12	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:12	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:12	WG1484996
Lithium	0.0594		0.0150	1	06/03/2020 18:12	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:12	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result mg/l	Qualifier	RDL mg/l	Dilution	Analysis date / time	Batch
Antimony	ND		0.00400	1	06/02/2020 13:27	WG1485005
Arsenic	0.0305		0.00200	1	06/02/2020 13:27	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:27	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:27	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:27	WG1485005

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	751		10.0	1	06/03/2020 20:06	WG1485978

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.06	T8	1	05/30/2020 12:00	WG1484441

Sample Narrative:

L1223308-10 WG1484441: 7.06 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.87		1.00	1	06/02/2020 03:44	WG1484939
Fluoride	0.162		0.150	1	06/02/2020 03:44	WG1484939
Sulfate	138		25.0	5	06/02/2020 12:27	WG1484939

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	06/02/2020 19:27	WG1484474

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.128		0.00500	1	06/03/2020 18:15	WG1484996
Beryllium	ND		0.00200	1	06/03/2020 18:15	WG1484996
Boron	1.14		0.200	1	06/03/2020 18:15	WG1484996
Cadmium	ND		0.00200	1	06/03/2020 18:15	WG1484996
Calcium	173		1.00	1	06/03/2020 18:15	WG1484996
Chromium	ND		0.0100	1	06/03/2020 18:15	WG1484996
Cobalt	ND		0.0100	1	06/03/2020 18:15	WG1484996
Lithium	0.0367		0.0150	1	06/03/2020 18:15	WG1484996
Molybdenum	ND		0.00500	1	06/03/2020 18:15	WG1484996

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	06/02/2020 13:30	WG1485005
Arsenic	ND		0.00200	1	06/02/2020 13:30	WG1485005
Lead	ND		0.00500	1	06/02/2020 13:30	WG1485005
Selenium	ND		0.00200	1	06/02/2020 13:30	WG1485005
Thallium	ND		0.00200	1	06/02/2020 13:30	WG1485005

Method Blank (MB)

(MB) R3535409-1 06/03/20 20:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1222537-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222537-01 06/03/20 20:06 • (DUP) R3535409-3 06/03/20 20:06

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	307	299	1	2.64		5

Laboratory Control Sample (LCS)

(LCS) R3535409-2 06/03/20 20:06

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	8730	99.2	85.0-115	

Method Blank (MB)

(MB) R3535527-1 06/04/20 16:34

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

L1223187-17 Original Sample (OS) • Duplicate (DUP)

(OS) L1223187-17 06/04/20 16:34 • (DUP) R3535527-3 06/04/20 16:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Dissolved Solids	539	544	1	0.923		5

Laboratory Control Sample (LCS)

(LCS) R3535527-2 06/04/20 16:34

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	6840	77.7	85.0-115	J4

L1222554-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222554-01 06/01/20 18:00 • (DUP) R3533880-2 06/01/20 18:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.38	6.34	1	0.629		1

Sample Narrative:

OS: 6.38 at 20.3C

DUP: 6.34 at 21.2C

L1223308-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-05 06/01/20 18:00 • (DUP) R3533880-3 06/01/20 18:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.99	7.00	1	0.143		1

Sample Narrative:

OS: 6.99 at 21.1C

DUP: 7 at 21C

Laboratory Control Sample (LCS)

(LCS) R3533880-1 06/01/20 18:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.02 at 20.4C

L1222550-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1222550-01 05/30/20 12:00 • (DUP) R3533373-2 05/30/20 12:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.64	7.61	1	0.393		1

Sample Narrative:

OS: 7.64 at 21.9C

DUP: 7.61 at 21.6C

L1223308-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-10 05/30/20 12:00 • (DUP) R3533373-3 05/30/20 12:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.06	7.07	1	0.142		1

Sample Narrative:

OS: 7.06 at 20.8C

DUP: 7.07 at 20.6C

Laboratory Control Sample (LCS)

(LCS) R3533373-1 05/30/20 12:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 21.1C

L1223242-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1223242-04 06/04/20 18:26 • (DUP) R3535206-2 06/04/20 18:26

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	7.71	7.73	1	0.259		1

Sample Narrative:

OS: 7.71 at 22.6C

DUP: 7.73 at 22.5C

L1223534-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1223534-02 06/04/20 18:26 • (DUP) R3535206-3 06/04/20 18:26

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	<1	<1	1	0.000		1

Sample Narrative:

OS: 0.75 at 22.6C

DUP: 0.74 at 22.7C

Laboratory Control Sample (LCS)

(LCS) R3535206-1 06/04/20 18:26

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	9.99	99.9	99.0-101	

Sample Narrative:

LCS: 9.99 at 21.9C

Method Blank (MB)

(MB) R3534169-1 06/01/20 12:38

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1223308-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-01 06/01/20 20:43 • (DUP) R3534169-3 06/01/20 21:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	14.0	13.9	1	0.669		15
Fluoride	0.278	0.276	1	0.686		15

L1223358-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1223358-07 06/02/20 06:07 • (DUP) R3534169-6 06/02/20 07:01

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	ND	ND	1	0.204		15
Fluoride	0.326	0.326	1	0.184		15
Sulfate	ND	ND	1	1.66		15

L1223308-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223308-01 06/02/20 10:58 • (DUP) R3534169-8 06/02/20 11:15

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	110	109	5	1.14		15

Laboratory Control Sample (LCS)

(LCS) R3534169-2 06/01/20 12:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	40.1	100	80.0-120	
Fluoride	8.00	8.09	101	80.0-120	
Sulfate	40.0	40.8	102	80.0-120	

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02/20 01:21 • (MS) R3534169-4 06/02/20 01:39 • (MSD) R3534169-5 06/02/20 01:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	20.8	67.7	68.2	93.9	94.8	1	80.0-120			0.660	15
Fluoride	5.00	0.208	4.97	5.00	95.3	95.9	1	80.0-120			0.596	15
Sulfate	50.0	207	242	242	69.9	70.7	1	80.0-120	E V	E V	0.165	15

L1223358-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1223358-07 06/02/20 06:07 • (MS) R3534169-7 06/02/20 07:19

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	ND	50.6	100	1	80.0-120	
Fluoride	5.00	0.326	5.32	99.8	1	80.0-120	
Sulfate	50.0	ND	51.0	100	1	80.0-120	

Method Blank (MB)

(MB) R3534343-1 06/02/20 18:56

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3534343-2 06/02/20 18:58

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00324	108	80.0-120	

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02/20 19:00 • (MS) R3534343-3 06/02/20 19:02 • (MSD) R3534343-4 06/02/20 19:04

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00313	0.00310	104	103	1	75.0-125			1.26	20

Method Blank (MB)

(MB) R3534781-1 06/03/20 19:06

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	0.00193	J	0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3534781-2 06/03/20 19:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.988	98.8	80.0-120	
Beryllium	1.00	0.994	99.4	80.0-120	
Boron	1.00	1.00	100	80.0-120	
Cadmium	1.00	0.964	96.4	80.0-120	
Calcium	10.0	9.98	99.8	80.0-120	
Chromium	1.00	0.969	96.9	80.0-120	
Cobalt	1.00	0.992	99.2	80.0-120	
Lithium	1.00	0.964	96.4	80.0-120	
Molybdenum	1.00	0.990	99.0	80.0-120	

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

(OS) • (MS) R3534781-4 06/03/20 19:16 • (MSD) R3534781-5 06/03/20 19:18

Analyte	Spike Amount mg/l	Original Result	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00		1.07	1.07	96.6	96.9	1	75.0-125			0.267	20
Beryllium	1.00		0.990	0.993	99.0	99.3	1	75.0-125			0.301	20
Boron	1.00		1.01	1.01	98.0	98.3	1	75.0-125			0.297	20
Cadmium	1.00		0.962	0.962	96.2	96.2	1	75.0-125			0.0267	20
Calcium	10.0		82.1	82.5	82.3	86.7	1	75.0-125			0.529	20
Chromium	1.00		0.972	0.962	97.2	96.2	1	75.0-125			1.02	20
Cobalt	1.00		0.989	0.995	98.9	99.5	1	75.0-125			0.547	20
Lithium	1.00		0.954	0.956	94.4	94.7	1	75.0-125			0.263	20
Molybdenum	1.00		0.990	0.995	98.7	99.2	1	75.0-125			0.498	20

Method Blank (MB)

(MB) R3534780-1 06/03/20 17:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	U		0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3534780-2 06/03/20 17:38

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.983	98.3	80.0-120	
Beryllium	1.00	0.989	98.9	80.0-120	
Boron	1.00	0.999	99.9	80.0-120	
Cadmium	1.00	0.963	96.3	80.0-120	
Calcium	10.0	9.93	99.3	80.0-120	
Chromium	1.00	0.964	96.4	80.0-120	
Cobalt	1.00	0.987	98.7	80.0-120	
Lithium	1.00	0.958	95.8	80.0-120	
Molybdenum	1.00	0.993	99.3	80.0-120	

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/03/20 17:40 • (MS) R3534780-4 06/03/20 17:46 • (MSD) R3534780-5 06/03/20 17:48

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.0977	1.08	1.07	97.8	96.9	1	75.0-125			0.793	20
Beryllium	1.00	ND	0.990	0.982	99.0	98.2	1	75.0-125			0.782	20
Boron	1.00	ND	1.04	1.03	99.7	98.5	1	75.0-125			1.17	20
Cadmium	1.00	ND	0.980	0.970	98.0	97.0	1	75.0-125			1.00	20
Calcium	10.0	78.8	86.4	86.6	76.7	78.8	1	75.0-125			0.248	20
Chromium	1.00	ND	0.980	0.962	98.0	96.2	1	75.0-125			1.83	20
Cobalt	1.00	ND	1.00	0.996	100	99.6	1	75.0-125			0.892	20
Lithium	1.00	0.0405	0.981	0.976	94.0	93.5	1	75.0-125			0.505	20
Molybdenum	1.00	ND	1.01	0.997	101	99.4	1	75.0-125			1.09	20

Method Blank (MB)

(MB) R3534175-1 06/02/20 12:28

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.00132	0.00400
Arsenic	U		0.000735	0.00200
Lead	U		0.00249	0.00500
Selenium	U		0.000657	0.00200
Thallium	U		0.000460	0.00200

Laboratory Control Sample (LCS)

(LCS) R3534175-2 06/02/20 12:31

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0492	98.5	80.0-120	
Arsenic	0.0500	0.0511	102	80.0-120	
Lead	0.0500	0.0500	100	80.0-120	
Selenium	0.0500	0.0457	91.4	80.0-120	
Thallium	0.0500	0.0491	98.3	80.0-120	

L1223308-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223308-08 06/02/20 12:34 • (MS) R3534175-4 06/02/20 12:41 • (MSD) R3534175-5 06/02/20 12:45

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0501	0.0494	100	98.9	1	75.0-125			1.37	20
Arsenic	0.0500	0.00227	0.0514	0.0514	98.3	98.2	1	75.0-125			0.124	20
Lead	0.0500	ND	0.0496	0.0495	99.2	99.1	1	75.0-125			0.118	20
Selenium	0.0500	ND	0.0470	0.0473	94.0	94.5	1	75.0-125			0.553	20
Thallium	0.0500	ND	0.0487	0.0486	97.4	97.3	1	75.0-125			0.107	20

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J4	The associated batch QC was outside the established quality control range for accuracy.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

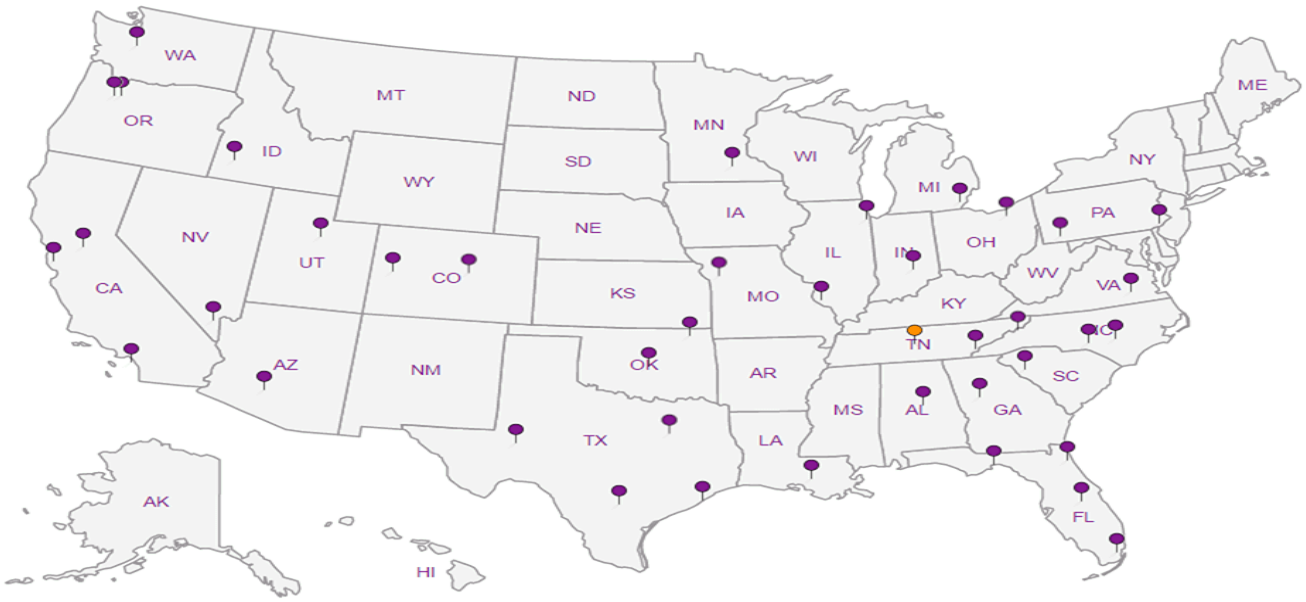
Third Party Federal Accreditations

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

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

Our Locations

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



Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected: Kansas

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # KCBPU Nearman

Lab Project # KCKAN02-MW NEARMAN2

Collected by (print): Kevin Bolling

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y △

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: Standard TAT

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-2A / GW01		GW		5-27-20	1440	3	X	X	X		-01
MW-3 / GW01		GW		5-27-20	1540	3	X	X	X		-02
MW-4 / GW01		GW		5-27-20	1645	3	X	X	X		-03
MW-8A / GW01		GW		5-27-20	1240	3	X	X	X		-04
MW-10 / GW01		GW		5-27-20	1330	3	X	X	X		-05
MW-13 / GW01		GW		5-28-20	0950	3	X	X	X		-06
MW-14 / GW01		GW		5-27-20	1130	3	X	X	X		-07
MW-15 / GW01 MS/MSD		GW		5-27-20	1018	9	X	X	X		-08
MW-16 / GW01		GW		5-28-20	1055	3	X	X	X		-09
DUP-1 / GW01		GW		5-27-20	—	3	X	X	X		-10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Relinquished by : (Signature) Date: 5-28-20 Time: 1158 Received by: (Signature)

Relinquished by : (Signature) Date: 5-28-20 Time: 1800 Received by: (Signature) FedEx

Relinquished by : (Signature) Date: Time: Received for lab by: (Signature) Date: 5/29/20 Time: 9:00

Trip Blank Received: Yes / No
HCL / MeoH
TBR

Temp: 0.7 °C Bottles Received: 30

Hold:

Condition: NCF / OK

Sample Receipt Checklist
COC Seal Present/Intact: __NP Y __N
COC Signed/Accurate: Y __N
Bottles arrive intact: Y __N
Correct bottles used: Y __N
Sufficient volume sent: Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: Y __N
RAD Screen <0.5 mR/hr: Y __N

If preservation required by Login: Date/Time

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # L1223308

C184

Acctnum: KCKAN02
Template: T109043
Prelogin: P768452
PM: 650 - Linda Cashman
PB: LC 4/15
Shipped Via: FedEX Ground

Memorandum

Date: July 8, 2020

To: Brian Hoye

From: Kortney Blaufuss

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020
Project No. 88777

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected May 27 through 28, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010B/6020
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pH	SW-846 9040C
Radium 226 and 228[2] (Combined)	SM 7500 Ra B M (radium-226) EPA 904.0 (radium-228)

Notes:
[1]Metals performed by SW-846 6010B include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020 include antimony, arsenic, lead, selenium, and thallium.
[2]Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates on the COCs were present.

2. Requested Analyses Completed – All analyses were completed as requested for the appropriate parameters for the May groundwater sampling event.

    - It should be noted that selenium was analyzed under the SW-846 6020 method for the May 2020 sampling event, and analyzed under SW-846 6010B for previous sampling events. As such, for statistical purposes the reporting limits for selenium were averaged. There are no statistically significant data points for selenium, and impact to the data negligible.

3. Holding Times – The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

   With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

4. Sample Preservation – All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (ºC) sample preservation temperature range. Because no samples were received frozen, all were considered viable.

5. Laboratory Method Blanks – Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:

   - Molybdenum (0.00193 J mg/L) was detected in the method blank in batch WG1484995. The associated sample was nondetect for molybdenum. As such, cross-contamination was not a concern, and no data qualifiers were added.

   - Radium-226 (-0.00564 pCi/L) and radium-228 (0.862 pCi/L) were detected in the method blanks in batches WG1496885 and WG1492751, respectively. Because the radium-226 detection exhibited a negative result, it was considered non detect. Historical data shows radium (226 and/or 228) has been detected above the reporting limit in more than one sampling event, and there is also a level of uncertainty in radium results that is not typically addressed or relevant information provided for this scope of work. Rather than qualifying all samples nondetect (U) based on these method blank concentrations, as these data will be used for statistical analyses, the samples were qualified as follows:

     - All of the samples had detections with an associated uncertainty at or near the radium-228 method blank concentration. Because this fraction was used to report the combined radium concentration, all combined radium results were qualified as estimated (J) based on professional judgment. Combined radium has historically been detected in these wells, and this sampling event is consistent with these results, as qualified.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and

LCSD were compared with each other for reproducibility using the relative percent difference (RPD). With the following exceptions, all LCS/LCSD RECs and/or RPDs were within their respective QC limits:

- QC batch WG1486263: the LCS REC for dissolved solids recovered below its QC limit. The associated samples had detections of dissolved solids and were qualified as estimated low bias (J-).

7. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:

   - MW-15/GW-01: The spike amount for sulfate was less than one-fourth the concentration in the noted parent sample. As such, no conclusion could be made regarding the accuracy of this spike. No data qualifiers were added based on this MS/MSD.

     All other MS/MSD results for this noted sample were within control limits.

8. Laboratory Duplicate Results – In instances where a MS/MSD was not applicable, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits.

9. Field Duplicate Results – Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:

   - Is the compound detected in both portions?

   - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.

   - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.

- If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

One field duplicate pair was collected for the May 2020 sampling event. Table 2 presents the side-by-side comparison of the field duplicate results. Qualifiers are not typically added based on the field duplicate review unless otherwise noted. The higher of the two concentrations are considered more viable for use in reporting.

- MW-10/GW-01 // DUP-1/GW-01: The combined radium results slightly exceeded the normalized difference. These results were previously qualified for method blank detections. All other field duplicate results were adequately replicated, and no qualifiers were added based on field duplicate review.

10. Detection and Quantitation Limits – In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based on these dilutions.

11. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data Qualifiers
Table 2: Field Duplicate Results

Table 1
Data Qualifiers
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in SDG L1223308		pH	J	Holding time exceeded (see text)
MW-13/GW-01	L1223308-06	Dissolved solids	J-	LCS REC < QC Limit
MW-16/GW-01	L1223308-09			
All Samples in SDG L1223378		Combined Radium	J	Method Blank Detection (see text)

Notes:

J(-) - Estimated Value (low bias)
LCS - Laboratory Control Sample
QC - Quality Control
REC - Percent recovery
SDG - Sample Delivery Group

Table 2
Field Duplicate Results
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020

	Sample Identification:	MW-10/GW-01	DUP-1/GW-01	
	Date Sampled:	5/27/2020	5/27/2020	
	SDG(s):	L1223308-05 L1223378-05 (radium)	L1223308-10 L1223378-10 (radium)	Meets QC Criteria
Parameter	**Unit**	**Result**	**Result**	
Dissolved Solids	mg/l	761	751	Yes
Chloride	mg/l	9.86	9.87	Yes
Fluoride	mg/l	0.162	0.162	Yes
Sulfate	mg/l	138	138	Yes
pH	su	6.99	7.06	Yes
Barium	mg/l	0.129	0.128	Yes
Boron	mg/l	1.17	1.14	Yes
Calcium	mg/l	173	173	Yes
Lithium	mg/l	0.04	0.0367	Yes
Combined Radium (including +/- uncertainty)	pCi/l	0.213 (+/- 0.865)	0.808 (+/- 0.920)	Yes

Notes:

mg/l - milligrams per liter
pCi/l - picoCuries per liter
QC - Quality Control
SDG - Sample Delivery Group
su - standard unit

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

June 29, 2020

Kansas City Board of Public Utilities

Sample Delivery Group:	L1223378
Samples Received:	05/29/2020
Project Number:	62801 BPU Nearman
Description:	groundwater

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

TABLE OF CONTENTS

MW-2A/GW01 L1223378-01 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/27/20 14:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, TN

MW-3/GW01 L1223378-02 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/27/20 15:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, TN

MW-4/GW01 L1223378-03 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/27/20 16:45 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 11:38	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 11:38	RGT	Mt. Juliet, TN

MW-8A/GW01 L1223378-04 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/27/20 12:40 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

MW-10/GW01 L1223378-05 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/27/20 13:30 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

MW-13/GW01 L1223378-06 Non-Potable Water

Collected by: Kevin Bolling | Collected date/time: 05/28/20 09:50 | Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

MW-14/GW01 L1223378-07 Non-Potable Water

Collected by: Kevin Bolling
Collected date/time: 05/27/20 11:30
Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

MW-15/GW01 L1223378-08 Non-Potable Water

Collected by: Kevin Bolling
Collected date/time: 05/27/20 10:18
Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

MW-16/GW01 L1223378-09 Non-Potable Water

Collected by: Kevin Bolling
Collected date/time: 05/28/20 10:55
Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 12:22	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 12:22	RGT	Mt. Juliet, TN

DUP-1/GW01 L1223378-10 Non-Potable Water

Collected by: Kevin Bolling
Collected date/time: 05/27/20 00:00
Received date/time: 05/29/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1492751	1	06/16/20 10:29	06/24/20 09:45	SNR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1496885	1	06/22/20 14:42	06/24/20 13:17	SNR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1496885	1	06/22/20 14:42	06/24/20 13:17	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.

Linda Cashman
Project Manager

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.747		0.593	0.918	06/24/2020 09:45	WG1492751
(T) Barium	*98.9*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*108*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.06		0.828	1.17	06/24/2020 11:38	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.317		0.235	0.255	06/24/2020 11:38	WG1496885
(T) Barium-133	*98.1*			*30.0-143*	*06/24/2020 11:38*	WG1496885

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.11		0.535	0.75	06/24/2020 09:45	WG1492751
(T) Barium	*101*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*101*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.19		0.654	0.924	06/24/2020 11:38	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0858		0.119	0.174	06/24/2020 11:38	WG1496885
(T) Barium-133	*107*			*30.0-143*	*06/24/2020 11:38*	WG1496885

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.124		0.614	1.11	06/24/2020 09:45	WG1492751
(T) Barium	*94.4*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*102*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.0763		0.747	1.33	06/24/2020 11:38	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0763		0.133	0.216	06/24/2020 11:38	WG1496885
(T) Barium-133	*104*			*30.0-143*	*06/24/2020 11:38*	WG1496885

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.367		0.606	1.14	06/24/2020 09:45	WG1492751
(T) Barium	*88.4*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*106*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.0386		0.806	1.5	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.0386		0.200	0.357	06/24/2020 12:22	WG1496885
(T) Barium-133	*101*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-1.46		0.666	1.3	06/24/2020 09:45	WG1492751
(T) Barium	*93.8*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*111*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.213		0.865	1.53	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.213		0.199	0.229	06/24/2020 12:22	WG1496885
(T) Barium-133	*99.0*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.386		0.606	1.06	06/24/2020 09:45	WG1492751
(T) Barium	*88.4*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*101*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.776		0.871	1.32	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.390		0.265	0.258	06/24/2020 12:22	WG1496885
(T) Barium-133	*114*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	1.15		0.579	1.15	06/24/2020 09:45	WG1492751
(T) Barium	*80.3*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*105*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	1.26		0.730	1.37	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.113		0.151	0.219	06/24/2020 12:22	WG1496885
(T) Barium-133	*119*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.801		0.635	1.13	06/24/2020 09:45	WG1492751
(T) Barium	*91.5*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*112*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.859		0.766	1.37	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.0579		0.131	0.24	06/24/2020 12:22	WG1496885
(T) Barium-133	*116*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	-0.294		0.573	1.22	06/24/2020 09:45	WG1492751
(T) Barium	*82.2*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*104*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.198		0.790	1.51	06/24/2020 12:22	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.198		0.217	0.287	06/24/2020 12:22	WG1496885
(T) Barium-133	*103*			*30.0-143*	*06/24/2020 12:22*	WG1496885

Radiochemistry by Method 904

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-228	0.646		0.707	0.873	06/24/2020 09:45	WG1492751
(T) Barium	*101*			*62.0-143*	*06/24/2020 09:45*	WG1492751
(T) Yttrium	*101*			*79.0-136*	*06/24/2020 09:45*	WG1492751

Radiochemistry by Method Calculation

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
Combined Radium	0.808		0.920	1.18	06/24/2020 13:17	WG1496885

Radiochemistry by Method SM7500Ra B M

Analyte	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.163		0.213	0.304	06/24/2020 13:17	WG1496885
(T) Barium-133	*103*			*30.0-143*	*06/24/2020 13:17*	WG1496885

Method Blank (MB)

(MB) R3543388-1 06/23/20 10:00

Analyte	MB Result	MB Qualifier	MB MDA
	pCi/l		pCi/l
Radium-228	0.862		0.296
(T) Barium	*87.3*		
(T) Yttrium	*105*		

L1223378-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223378-01 06/24/20 09:45 • (DUP) R3543388-5 06/23/20 10:00

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	pCi/l		%			%	
Radium-228	0.747	0.613	1	19.7	0.132		20	3
(T) Barium	*98.9*	*94.6*						
(T) Yttrium	*108*	*100*						

Laboratory Control Sample (LCS)

(LCS) R3543388-2 06/23/20 10:00

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	5.20	104	80.0-120	
(T) Barium			*88.5*		
(T) Yttrium			*103*		

L1223378-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223378-08 06/24/20 09:45 • (MS) R3543388-3 06/23/20 10:00 • (MSD) R3543388-4 06/23/20 10:00

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.801	11.0	10.0	102	92.4	1	70.0-130			9.49		20
(T) Barium		*91.5*			*93.0*	*93.7*							
(T) Yttrium		*112*			*103*	*104*							

Method Blank (MB)

(MB) R3543240-1 06/24/20 11:38

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	-0.00564		0.0711
(T) Barium-133	*96.6*		

L1223378-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1223378-01 06/24/20 11:38 • (DUP) R3543240-5 06/24/20 11:38

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.317	0.0350	1	160	0.826		20	3
(T) Barium-133	*98.1*	*89.2*						

Laboratory Control Sample (LCS)

(LCS) R3543240-2 06/24/20 11:38

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.32	106	80.0-120	
(T) Barium-133			*102*		

L1223378-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1223378-08 06/24/20 12:22 • (MS) R3543240-3 06/24/20 11:38 • (MSD) R3543240-4 06/24/20 11:38

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.0579	20.6	21.2	102	105	1	75.0-125			3.11		20
(T) Barium-133		*116*			*99.8*	*98.9*							

Guide to Reading and Understanding Your Laboratory Report

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

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

Abbreviations and Definitions

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

Qualifier	Description

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

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

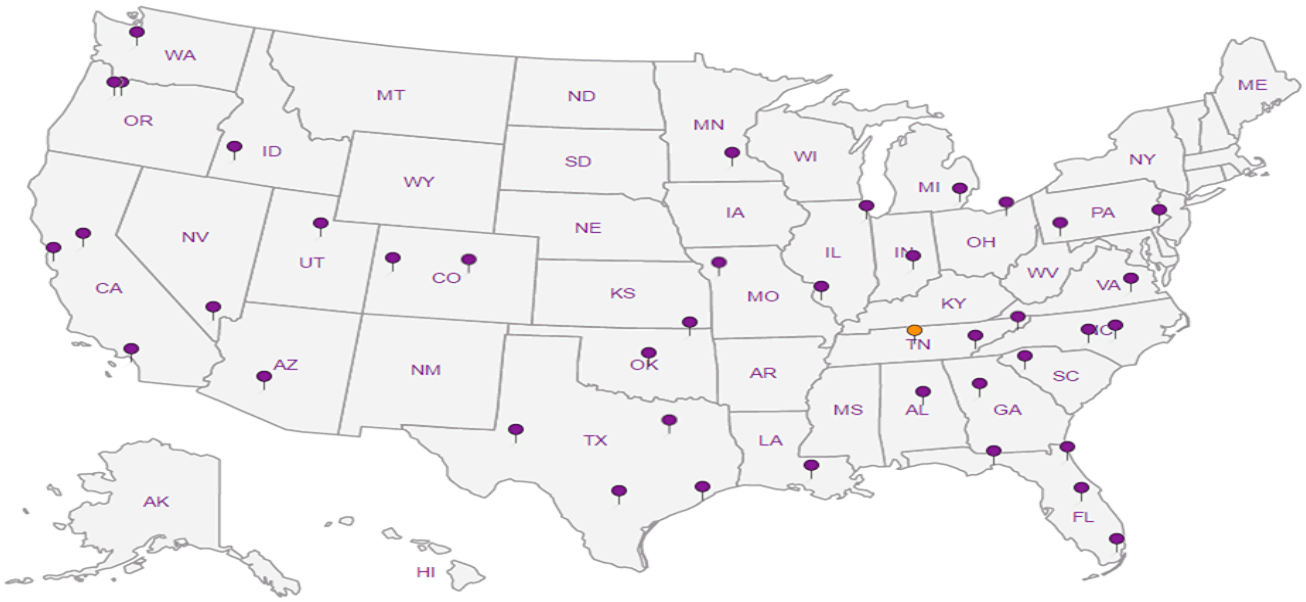
Third Party Federal Accreditations

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

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

Our Locations

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



Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
Attn: Ellen Bouse
300 N 65th Street
Kansas City, KS 66102

Pres Chk

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: groundwater

City/State Collected: Kansas

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # 62801 BPU Nearman

Lab Project # KCKAN02-MW NEARMAN

Collected by (print): Kevin Bolling

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N___ Y___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STANDARD TAT

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Tota Rad,RA226,RA228 1L-HDPE-Add HNO3 <2										Remarks	Sample # (lab only)
MW-2A / GW01		NPW		5-27-20	1440	2	X											-01
MW-3 / GW01		NPW		5-27-20	1540	2	X											02
MW-4 / GW01		NPW		5-27-20	1645	2	X											03
MW-8A / GW01		NPW		5-27-20	1240	2	X											04
MW-10 / GW01		NPW		5-27-20	1330	2	X											05
MW-13 / GW01		NPW		5-28-20	0950	2	X											06
MW-14 / GW01		NPW		5-27-20	1130	2	X											07
MW-15 / GW01 MS/MSD		NPW		5-27-20	1018	2	X											08
MW-16 / GW01		NPW		5-28-20	1055	2	X											09
DUP-1 / GW01		NPW		5-27-20	—	2	X											10

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1223378

C186

Acctnum: KCKAN02
Template: T150051
Prelogin: P768465
PM: 650 - Linda Cashman
PB: TB 4-15-20
Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

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

	Date:	Time:		
Relinquished by : (Signature)	5-28-20	1158	Received by: (Signature)	Trip Blank Received: Yes / No HCL / MeoH TBR
Relinquished by : (Signature)	5-28-20	1800	Received by: (Signature) FedEx	Temp: .8-1.7 °C Bottles Received: 34
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 5/29/20 Time: 9:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Memorandum

Date: July 8, 2020

To: Brian Hoye

From: Kortney Blaufuss

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020
Project No. 88777

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected May 27 through 28, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010B/6020
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pH	SW-846 9040C
Radium 226 and 228[2] (Combined)	SM 7500 Ra B M (radium-226) EPA 904.0 (radium-228)

Notes:
[1]Metals performed by SW-846 6010B include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020 include antimony, arsenic, lead, selenium, and thallium.
[2]Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates on the COCs were present.

2. Requested Analyses Completed – All analyses were completed as requested for the appropriate parameters for the May groundwater sampling event.

    - It should be noted that selenium was analyzed under the SW-846 6020 method for the May 2020 sampling event, and analyzed under SW-846 6010B for previous sampling events. As such, for statistical purposes the reporting limits for selenium were averaged. There are no statistically significant data points for selenium, and impact to the data negligible.

3. Holding Times – The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

   With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

4. Sample Preservation – All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (ºC) sample preservation temperature range. Because no samples were received frozen, all were considered viable.

5. Laboratory Method Blanks – Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:

   - Molybdenum (0.00193 J mg/L) was detected in the method blank in batch WG1484995. The associated sample was nondetect for molybdenum. As such, cross-contamination was not a concern, and no data qualifiers were added.

   - Radium-226 (-0.00564 pCi/L) and radium-228 (0.862 pCi/L) were detected in the method blanks in batches WG1496885 and WG1492751, respectively. Because the radium-226 detection exhibited a negative result, it was considered non detect. Historical data shows radium (226 and/or 228) has been detected above the reporting limit in more than one sampling event, and there is also a level of uncertainty in radium results that is not typically addressed or relevant information provided for this scope of work. Rather than qualifying all samples nondetect (U) based on these method blank concentrations, as these data will be used for statistical analyses, the samples were qualified as follows:

     - All of the samples had detections with an associated uncertainty at or near the radium-228 method blank concentration. Because this fraction was used to report the combined radium concentration, all combined radium results were qualified as estimated (J) based on professional judgment. Combined radium has historically been detected in these wells, and this sampling event is consistent with these results, as qualified.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and

LCSD were compared with each other for reproducibility using the relative percent difference (RPD). With the following exceptions, all LCS/LCSD RECs and/or RPDs were within their respective QC limits:

- QC batch WG1486263: the LCS REC for dissolved solids recovered below its QC limit. The associated samples had detections of dissolved solids and were qualified as estimated low bias (J-).

7. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:

   - MW-15/GW-01: The spike amount for sulfate was less than one-fourth the concentration in the noted parent sample. As such, no conclusion could be made regarding the accuracy of this spike. No data qualifiers were added based on this MS/MSD.

     All other MS/MSD results for this noted sample were within control limits.

8. Laboratory Duplicate Results – In instances where a MS/MSD was not applicable, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits.

9. Field Duplicate Results – Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:

   - Is the compound detected in both portions?

   - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.

   - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.

- If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

One field duplicate pair was collected for the May 2020 sampling event. Table 2 presents the side-by-side comparison of the field duplicate results. Qualifiers are not typically added based on the field duplicate review unless otherwise noted. The higher of the two concentrations are considered more viable for use in reporting.

- MW-10/GW-01 // DUP-1/GW-01: The combined radium results slightly exceeded the normalized difference. These results were previously qualified for method blank detections. All other field duplicate results were adequately replicated, and no qualifiers were added based on field duplicate review.

10. Detection and Quantitation Limits – In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based on these dilutions.

11. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data Qualifiers
Table 2: Field Duplicate Results

Table 1
Data Qualifiers
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in SDG L1223308		pH	J	Holding time exceeded (see text)
MW-13/GW-01	L1223308-06	Dissolved solids	J-	LCS REC < QC Limit
MW-16/GW-01	L1223308-09			
All Samples in SDG L1223378		Combined Radium	J	Method Blank Detection (see text)

Notes:

J(-) - Estimated Value (low bias)
LCS - Laboratory Control Sample
QC - Quality Control
REC - Percent recovery
SDG - Sample Delivery Group

Table 2
Field Duplicate Results
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – May 2020

	Sample Identification:	MW-10/GW-01	DUP-1/GW-01	
	Date Sampled:	5/27/2020	5/27/2020	
	SDG(s):	L1223308-05 L1223378-05 (radium)	L1223308-10 L1223378-10 (radium)	Meets QC Criteria
Parameter	**Unit**	**Result**	**Result**	
Dissolved Solids	mg/l	761	751	Yes
Chloride	mg/l	9.86	9.87	Yes
Fluoride	mg/l	0.162	0.162	Yes
Sulfate	mg/l	138	138	Yes
pH	su	6.99	7.06	Yes
Barium	mg/l	0.129	0.128	Yes
Boron	mg/l	1.17	1.14	Yes
Calcium	mg/l	173	173	Yes
Lithium	mg/l	0.04	0.0367	Yes
Combined Radium (including +/- uncertainty)	pCi/l	0.213 (+/- 0.865)	0.808 (+/- 0.920)	Yes

Notes:

mg/l - milligrams per liter
pCi/l - picoCuries per liter
QC - Quality Control
SDG - Sample Delivery Group
su - standard unit

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 30, 2020

Kansas City Board of Public Utilities

Sample Delivery Group:	L1276512
Samples Received:	10/22/2020
Project Number:	KCBPU Nearman
Description:	GW-Creek Bottom Ash Pond

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

T. Alan Harvill
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

MW-2A/GW02 L1276512-01 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 11:00 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 05:26	10/28/20 05:26	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 06:18	10/28/20 06:18	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 07:58	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 13:15	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 21:31	LD	Mt. Juliet, TN

MW-3/GW02 L1276512-02 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 12:05 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 06:44	10/28/20 06:44	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 06:57	10/28/20 06:57	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:11	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 13:57	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 21:54	LD	Mt. Juliet, TN

MW-4/GW02 L1276512-03 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 12:50 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 07:37	10/28/20 07:37	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:17	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:00	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:06	LD	Mt. Juliet, TN

MW-8A/GW02 L1276512-04 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 08:50 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:03	10/28/20 08:03	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 08:16	10/28/20 08:16	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:19	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:03	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:09	LD	Mt. Juliet, TN

MW-10/GW02 L1276512-05 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 09:55 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:29	10/28/20 08:29	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 08:42	10/28/20 08:42	ELN	Mt. Juliet, TN

MW-10/GW02 L1276512-05 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 09:55 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:21	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565114	1	10/25/20 12:19	10/26/20 14:05	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:12	LD	Mt. Juliet, TN

MW-13/GW02 L1276512-06 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 15:15 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 08:55	10/28/20 08:55	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:23	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:11	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:15	LD	Mt. Juliet, TN

MW-14/GW02 L1276512-07 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 17:15 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 09:21	10/28/20 09:21	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 09:34	10/28/20 09:34	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:25	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:14	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:19	LD	Mt. Juliet, TN

MW-15/GW02 L1276512-08 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/20/20 09:20 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 10:13	10/28/20 10:13	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 10:26	10/28/20 10:26	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:27	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:17	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:22	LD	Mt. Juliet, TN

MW-16/GW02 L1276512-09 GW

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 16:15 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 10:39	10/28/20 10:39	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 10:53	10/28/20 10:53	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:29	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 18:57	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:25	LD	Mt. Juliet, TN

DUP-1/GW02 L1276512-10 GW

Collected by: Jonathan Hermanson
Collected date/time: 10/19/20 00:00
Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1564807	1	10/24/20 08:14	10/24/20 11:22	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1564759	1	10/26/20 00:17	10/26/20 00:17	MCG	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	1	10/28/20 11:06	10/28/20 11:06	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1566100	5	10/28/20 11:19	10/28/20 11:19	ELN	Mt. Juliet, TN
Mercury by Method 7470A	WG1563994	1	10/25/20 11:54	10/26/20 08:31	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010D	WG1565552	1	10/28/20 12:43	10/28/20 19:26	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1564169	1	10/24/20 14:13	10/25/20 22:28	LD	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 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.

T. Alan Harvill
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	622		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.14	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-01 WG1564759: 7.14 at 22.7C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.7		1.00	1	10/28/2020 05:26	WG1566100
Fluoride	0.234		0.150	1	10/28/2020 05:26	WG1566100
Sulfate	113		25.0	5	10/28/2020 06:18	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 07:58	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.171		0.00500	1	10/26/2020 13:15	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 13:15	WG1565114
Boron	0.221		0.200	1	10/26/2020 13:15	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 13:15	WG1565114
Calcium	168	V	1.00	1	10/26/2020 13:15	WG1565114
Chromium	ND		0.0100	1	10/26/2020 13:15	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 13:15	WG1565114
Lithium	0.0302		0.0150	1	10/26/2020 13:15	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 13:15	WG1565114

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 21:31	WG1564169
Arsenic	0.00289		0.00200	1	10/25/2020 21:31	WG1564169
Lead	ND		0.00500	1	10/25/2020 21:31	WG1564169
Selenium	ND		0.00200	1	10/25/2020 21:31	WG1564169
Thallium	ND		0.00200	1	10/25/2020 21:31	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	737		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.97	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-02 WG1564759: 6.97 at 20.7C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	6.91		1.00	1	10/28/2020 06:44	WG1566100
Fluoride	0.178		0.150	1	10/28/2020 06:44	WG1566100
Sulfate	117		25.0	5	10/28/2020 06:57	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:11	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.170		0.00500	1	10/26/2020 13:57	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 13:57	WG1565114
Boron	ND		0.200	1	10/26/2020 13:57	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 13:57	WG1565114
Calcium	198		1.00	1	10/26/2020 13:57	WG1565114
Chromium	ND		0.0100	1	10/26/2020 13:57	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 13:57	WG1565114
Lithium	0.0521		0.0150	1	10/26/2020 13:57	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 13:57	WG1565114

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 21:54	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 21:54	WG1564169
Lead	ND		0.00500	1	10/25/2020 21:54	WG1564169
Selenium	0.00224		0.00200	1	10/25/2020 21:54	WG1564169
Thallium	ND		0.00200	1	10/25/2020 21:54	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	478		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.23	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-03 WG1564759: 7.23 at 20.6C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	9.94		1.00	1	10/28/2020 07:37	WG1566100
Fluoride	0.175		0.150	1	10/28/2020 07:37	WG1566100
Sulfate	66.5		5.00	1	10/28/2020 07:37	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:17	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.118		0.00500	1	10/26/2020 14:00	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:00	WG1565114
Boron	ND		0.200	1	10/26/2020 14:00	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:00	WG1565114
Calcium	122		1.00	1	10/26/2020 14:00	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:00	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:00	WG1565114
Lithium	0.0340		0.0150	1	10/26/2020 14:00	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 14:00	WG1565114

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:06	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 22:06	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:06	WG1564169
Selenium	0.00252		0.00200	1	10/25/2020 22:06	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:06	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	953		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.17	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-04 WG1564759: 7.17 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	23.9		1.00	1	10/28/2020 08:03	WG1566100
Fluoride	0.357		0.150	1	10/28/2020 08:03	WG1566100
Sulfate	353		25.0	5	10/28/2020 08:16	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:19	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.194		0.00500	1	10/26/2020 14:03	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:03	WG1565114
Boron	2.66		0.200	1	10/26/2020 14:03	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:03	WG1565114
Calcium	160		1.00	1	10/26/2020 14:03	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:03	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:03	WG1565114
Lithium	0.0281		0.0150	1	10/26/2020 14:03	WG1565114
Molybdenum	0.0105		0.00500	1	10/26/2020 14:03	WG1565114

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:09	WG1564169
Arsenic	0.0373		0.00200	1	10/25/2020 22:09	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:09	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:09	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:09	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	752		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.42	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-05 WG1564759: 7.42 at 20.5C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.2		1.00	1	10/28/2020 08:29	WG1566100
Fluoride	0.167		0.150	1	10/28/2020 08:29	WG1566100
Sulfate	143		25.0	5	10/28/2020 08:42	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:21	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.116		0.00500	1	10/26/2020 14:05	WG1565114
Beryllium	ND		0.00200	1	10/26/2020 14:05	WG1565114
Boron	1.22		0.200	1	10/26/2020 14:05	WG1565114
Cadmium	ND		0.00200	1	10/26/2020 14:05	WG1565114
Calcium	168		1.00	1	10/26/2020 14:05	WG1565114
Chromium	ND		0.0100	1	10/26/2020 14:05	WG1565114
Cobalt	ND		0.0100	1	10/26/2020 14:05	WG1565114
Lithium	0.0446		0.0150	1	10/26/2020 14:05	WG1565114
Molybdenum	ND		0.00500	1	10/26/2020 14:05	WG1565114

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:12	WG1564169
Arsenic	0.00461		0.00200	1	10/25/2020 22:12	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:12	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:12	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:12	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	704		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.94	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-06 WG1564759: 6.94 at 21C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	20.6		1.00	1	10/28/2020 08:55	WG1566100
Fluoride	0.294		0.150	1	10/28/2020 08:55	WG1566100
Sulfate	92.4		5.00	1	10/28/2020 08:55	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:23	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.354		0.00500	1	10/28/2020 19:11	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:11	WG1565552
Boron	ND		0.200	1	10/28/2020 19:11	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:11	WG1565552
Calcium	181		1.00	1	10/28/2020 19:11	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:11	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:11	WG1565552
Lithium	0.0356		0.0150	1	10/28/2020 19:11	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:11	WG1565552

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:15	WG1564169
Arsenic	0.0303		0.00200	1	10/25/2020 22:15	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:15	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:15	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:15	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	882		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.83	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-07 WG1564759: 6.83 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	16.0		1.00	1	10/28/2020 09:21	WG1566100
Fluoride	0.199		0.150	1	10/28/2020 09:21	WG1566100
Sulfate	181		25.0	5	10/28/2020 09:34	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:25	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.138		0.00500	1	10/28/2020 19:14	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:14	WG1565552
Boron	ND		0.200	1	10/28/2020 19:14	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:14	WG1565552
Calcium	218		1.00	1	10/28/2020 19:14	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:14	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:14	WG1565552
Lithium	0.0287		0.0150	1	10/28/2020 19:14	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:14	WG1565552

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:19	WG1564169
Arsenic	ND		0.00200	1	10/25/2020 22:19	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:19	WG1564169
Selenium	0.0118		0.00200	1	10/25/2020 22:19	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:19	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	560		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.71	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-08 WG1564759: 7.71 at 20.8C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	21.4		1.00	1	10/28/2020 10:13	WG1566100
Fluoride	0.424		0.150	1	10/28/2020 10:13	WG1566100
Sulfate	211		25.0	5	10/28/2020 10:26	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:27	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.114		0.00500	1	10/28/2020 19:17	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:17	WG1565552
Boron	ND		0.200	1	10/28/2020 19:17	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:17	WG1565552
Calcium	82.6		1.00	1	10/28/2020 19:17	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:17	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:17	WG1565552
Lithium	0.0526		0.0150	1	10/28/2020 19:17	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:17	WG1565552

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:22	WG1564169
Arsenic	0.00488		0.00200	1	10/25/2020 22:22	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:22	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:22	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:22	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	821		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	6.84	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-09 WG1564759: 6.84 at 20.5C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	35.4		1.00	1	10/28/2020 10:39	WG1566100
Fluoride	ND		0.150	1	10/28/2020 10:39	WG1566100
Sulfate	115		25.0	5	10/28/2020 10:53	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:29	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.298		0.00500	1	10/28/2020 18:57	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 18:57	WG1565552
Boron	ND		0.200	1	10/28/2020 18:57	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 18:57	WG1565552
Calcium	231	V	1.00	1	10/28/2020 18:57	WG1565552
Chromium	ND		0.0100	1	10/28/2020 18:57	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 18:57	WG1565552
Lithium	0.0596		0.0150	1	10/28/2020 18:57	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 18:57	WG1565552

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:25	WG1564169
Arsenic	0.0313		0.00200	1	10/25/2020 22:25	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:25	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:25	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:25	WG1564169

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Dissolved Solids	736		10.0	1	10/24/2020 11:22	WG1564807

Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	su			date / time	
pH	7.50	T8	1	10/26/2020 00:17	WG1564759

Sample Narrative:

L1276512-10 WG1564759: 7.5 at 21C

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Chloride	12.1		1.00	1	10/28/2020 11:06	WG1566100
Fluoride	0.168		0.150	1	10/28/2020 11:06	WG1566100
Sulfate	144		25.0	5	10/28/2020 11:19	WG1566100

Mercury by Method 7470A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	10/26/2020 08:31	WG1563994

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Barium	0.116		0.00500	1	10/28/2020 19:26	WG1565552
Beryllium	ND		0.00200	1	10/28/2020 19:26	WG1565552
Boron	1.20		0.200	1	10/28/2020 19:26	WG1565552
Cadmium	ND		0.00200	1	10/28/2020 19:26	WG1565552
Calcium	170		1.00	1	10/28/2020 19:26	WG1565552
Chromium	ND		0.0100	1	10/28/2020 19:26	WG1565552
Cobalt	ND		0.0100	1	10/28/2020 19:26	WG1565552
Lithium	0.0412		0.0150	1	10/28/2020 19:26	WG1565552
Molybdenum	ND		0.00500	1	10/28/2020 19:26	WG1565552

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Antimony	ND		0.00400	1	10/25/2020 22:28	WG1564169
Arsenic	0.00475		0.00200	1	10/25/2020 22:28	WG1564169
Lead	ND		0.00500	1	10/25/2020 22:28	WG1564169
Selenium	ND		0.00200	1	10/25/2020 22:28	WG1564169
Thallium	ND		0.00200	1	10/25/2020 22:28	WG1564169

Method Blank (MB)

(MB) R3585329-1 10/24/20 11:22

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Dissolved Solids	U		2.82	10.0

Laboratory Control Sample (LCS)

(LCS) R3585329-2 10/24/20 11:22

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Dissolved Solids	8800	7560	85.9	77.4-123	

L1274287-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1274287-01 10/26/20 00:17 • (DUP) R3585376-2 10/26/20 00:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	8.21	8.21	1	0.000		1

Sample Narrative:

OS: 8.21 at 21.1C

DUP: 8.21 at 20.9C

L1276512-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-07 10/26/20 00:17 • (DUP) R3585376-3 10/26/20 00:17

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	su	su		%		%
pH	6.83	6.83	1	0.000		1

Sample Narrative:

OS: 6.83 at 20.8C

DUP: 6.83 at 21.1C

Laboratory Control Sample (LCS)

(LCS) R3585376-1 10/26/20 00:17

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.01 at 19.4C

Method Blank (MB)

(MB) R3586932-1 10/28/20 04:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Chloride	U		0.379	1.00
Fluoride	U		0.0640	0.150
Sulfate	U		0.594	5.00

L1276512-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-01 10/28/20 05:26 • (DUP) R3586932-3 10/28/20 05:39

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	12.7	12.6	1	0.293		15
Fluoride	0.234	0.227	1	2.95		15
Sulfate	120	119	1	0.317	E	15

L1276512-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276512-01 10/28/20 06:18 • (DUP) R3586932-6 10/28/20 06:31

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	113	114	5	0.192		15

L1276619-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1276619-01 10/28/20 16:21 • (DUP) R3586932-7 10/28/20 16:34

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	1.64	1.76	1	7.32		15
Fluoride	ND	0.150	1	3.88		15
Sulfate	9.12	9.40	1	2.98		15

Laboratory Control Sample (LCS)

(LCS) R3586932-2 10/28/20 05:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40.0	39.4	98.6	80.0-120	
Fluoride	8.00	8.10	101	80.0-120	

Laboratory Control Sample (LCS)

(LCS) R3586932-2 10/28/20 05:00

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Sulfate	40.0	39.6	98.9	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/28/20 05:26 • (MS) R3586932-4 10/28/20 05:52 • (MSD) R3586932-5 10/28/20 06:05

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50.0	12.7	62.4	65.1	99.4	105	1	80.0-120			4.31	15
Fluoride	5.00	0.234	5.22	5.53	99.6	106	1	80.0-120			5.80	15
Sulfate	50.0	120	164	169	88.3	98.4	1	80.0-120	E	E	3.04	15

L1276619-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1276619-01 10/28/20 16:21 • (MS) R3586932-8 10/28/20 16:47

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50.0	1.64	51.2	99.0	1	80.0-120	
Fluoride	5.00	ND	5.10	99.2	1	80.0-120	
Sulfate	50.0	9.12	59.0	99.8	1	80.0-120	

Method Blank (MB)

(MB) R3585516-1 10/26/20 07:54

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Mercury	U		0.000100	0.000200

Laboratory Control Sample (LCS)

(LCS) R3585516-2 10/26/20 07:56

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Mercury	0.00300	0.00287	95.5	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/26/20 07:58 • (MS) R3585516-3 10/26/20 08:00 • (MSD) R3585516-4 10/26/20 08:02

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Mercury	0.00300	ND	0.00266	0.00270	88.8	90.1	1	75.0-125			1.53	20

Method Blank (MB)

(MB) R3585839-1 10/26/20 13:08

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000895	0.00500
Beryllium	U		0.000460	0.00200
Boron	U		0.0254	0.200
Cadmium	U		0.000563	0.00200
Calcium	U		0.389	1.00
Chromium	U		0.00500	0.0100
Cobalt	U		0.000807	0.0100
Lithium	U		0.00574	0.0150
Molybdenum	U		0.00104	0.00500

Laboratory Control Sample (LCS)

(LCS) R3585839-2 10/26/20 13:12

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	0.995	99.5	80.0-120	
Beryllium	1.00	0.989	98.9	80.0-120	
Boron	1.00	0.985	98.5	80.0-120	
Cadmium	1.00	0.962	96.2	80.0-120	
Calcium	10.0	9.82	98.2	80.0-120	
Chromium	1.00	0.985	98.5	80.0-120	
Cobalt	1.00	0.985	98.5	80.0-120	
Lithium	1.00	0.958	95.8	80.0-120	
Molybdenum	1.00	1.01	101	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/26/20 13:15 • (MS) R3585839-4 10/26/20 13:20 • (MSD) R3585839-5 10/26/20 13:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.171	1.18	1.16	101	98.8	1	75.0-125			1.53	20
Beryllium	1.00	ND	1.00	1.00	100	100	1	75.0-125			0.0991	20
Boron	1.00	0.221	1.21	1.21	99.1	99.1	1	75.0-125			0.0424	20
Cadmium	1.00	ND	0.998	0.981	99.8	98.1	1	75.0-125			1.66	20
Calcium	10.0	168	174	175	54.8	64.9	1	75.0-125	V	V	0.578	20
Chromium	1.00	ND	0.991	0.981	99.1	98.1	1	75.0-125			1.02	20
Cobalt	1.00	ND	1.01	0.997	101	99.3	1	75.0-125			1.64	20
Lithium	1.00	0.0302	0.995	0.998	96.4	96.8	1	75.0-125			0.382	20
Molybdenum	1.00	ND	1.03	1.02	103	102	1	75.0-125			1.28	20

Method Blank (MB)

(MB) R3586819-1 10/28/20 18:52

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Barium	U		0.000736	0.00500
Beryllium	U		0.000330	0.00200
Boron	U		0.0200	0.200
Cadmium	U		0.000479	0.00200
Calcium	U		0.0793	1.00
Chromium	U		0.00140	0.0100
Cobalt	U		0.000840	0.0100
Lithium	U		0.00485	0.0150
Molybdenum	U		0.00116	0.00500

Laboratory Control Sample (LCS)

(LCS) R3586819-2 10/28/20 18:54

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Barium	1.00	1.01	101	80.0-120	
Beryllium	1.00	0.948	94.8	80.0-120	
Boron	1.00	0.976	97.6	80.0-120	
Cadmium	1.00	0.959	95.9	80.0-120	
Calcium	10.0	9.70	97.0	80.0-120	
Chromium	1.00	0.944	94.4	80.0-120	
Cobalt	1.00	0.979	97.9	80.0-120	
Lithium	1.00	0.939	93.9	80.0-120	
Molybdenum	1.00	1.01	101	80.0-120	

L1276512-09 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-09 10/28/20 18:57 • (MS) R3586819-4 10/28/20 19:03 • (MSD) R3586819-5 10/28/20 19:06

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Barium	1.00	0.298	1.26	1.27	95.9	97.3	1	75.0-125			1.07	20
Beryllium	1.00	ND	0.944	0.954	94.4	95.4	1	75.0-125			1.05	20
Boron	1.00	ND	1.11	1.13	96.5	97.7	1	75.0-125			1.10	20
Cadmium	1.00	ND	0.962	0.973	96.2	97.3	1	75.0-125			1.11	20
Calcium	10.0	231	233	237	15.2	56.9	1	75.0-125	V	V	1.78	20
Chromium	1.00	ND	0.929	0.946	92.9	94.6	1	75.0-125			1.72	20
Cobalt	1.00	ND	0.992	1.00	99.2	100	1	75.0-125			0.831	20
Lithium	1.00	0.0596	1.01	1.01	94.6	95.1	1	75.0-125			0.564	20
Molybdenum	1.00	ND	0.994	1.01	99.4	101	1	75.0-125			1.83	20

Method Blank (MB)

(MB) R3585369-1 10/25/20 21:25

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Antimony	U		0.00103	0.00400
Arsenic	U		0.000180	0.00200
Lead	U		0.000849	0.00500
Selenium	U		0.000300	0.00200
Thallium	U		0.000121	0.00200

Laboratory Control Sample (LCS)

(LCS) R3585369-2 10/25/20 21:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Antimony	0.0500	0.0510	102	80.0-120	
Arsenic	0.0500	0.0475	95.0	80.0-120	
Lead	0.0500	0.0458	91.7	80.0-120	
Selenium	0.0500	0.0490	97.9	80.0-120	
Thallium	0.0500	0.0447	89.5	80.0-120	

L1276512-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276512-01 10/25/20 21:31 • (MS) R3585369-4 10/25/20 21:38 • (MSD) R3585369-5 10/25/20 21:41

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	0.0500	ND	0.0536	0.0535	107	107	1	75.0-125			0.180	20
Arsenic	0.0500	0.00289	0.0494	0.0506	93.1	95.4	1	75.0-125			2.30	20
Lead	0.0500	ND	0.0439	0.0457	87.8	91.3	1	75.0-125			3.96	20
Selenium	0.0500	ND	0.0487	0.0497	97.5	99.4	1	75.0-125			1.99	20
Thallium	0.0500	ND	0.0431	0.0449	86.1	89.8	1	75.0-125			4.19	20

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

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
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
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

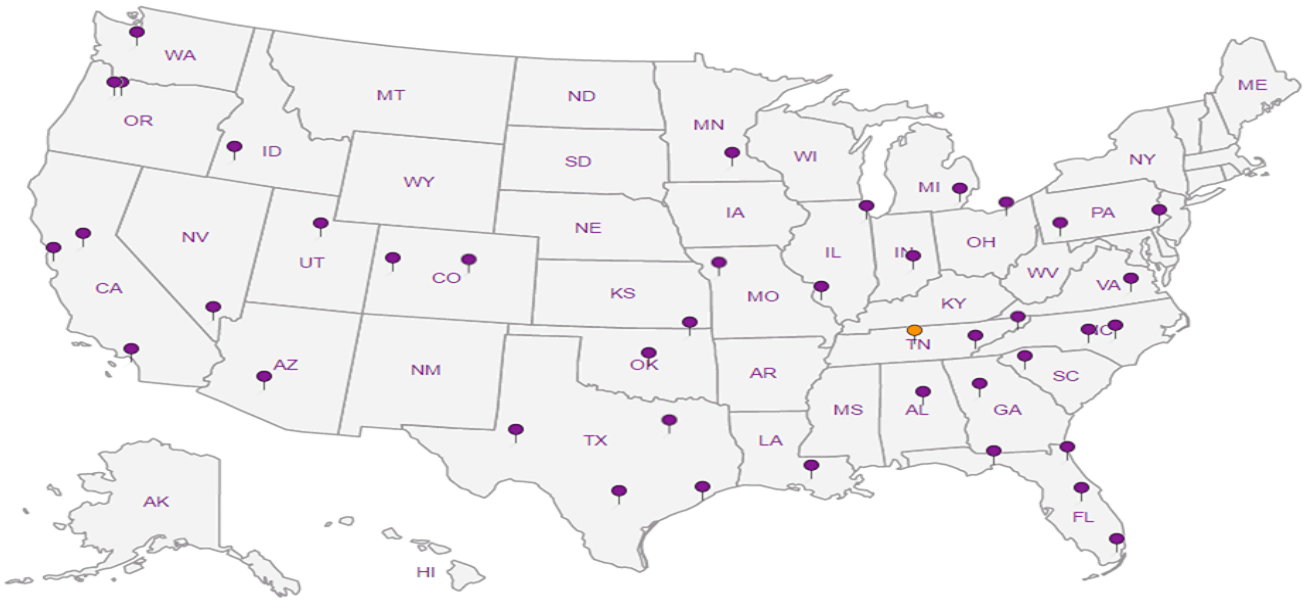
Third Party Federal Accreditations

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

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

Our Locations

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



Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # KCBPU Nearman

Lab Project # KCKAN02-MW NEARMAN2

SDG # 127612

G198

Collected by (print): Jonathan Heimansen

Site/Facility ID #

P.O. #

Acctnum: KCKAN02

Template: T109043

Prelogin: P803940

PM: 650 - Linda Cashman

PB:

Collected by (signature): Jonathan Heimansen

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STD

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-2A 6W02	Grab	GW	—	10-19-20	1100	3	X	X	X		-01
MW-3 6W02	Grab	GW	—	10-19-20	1205	3	X	X	X		02
MW-4 6W02	Grab	GW	—	10-19-20	1250	3	X	X	X		03
MW-8A 6W02	Grab	GW	—	10-19-20	0850	3	X	X	X		04
MW-10 6W02	Grab	GW	—	10-19-20	0955	3	X	X	X		05
MW-13 6W02	Grab	GW	—	10-19-20	1515	3	X	X	X		06
MW-14 6W02	Grab	GW	—	10-19-20	1715	3	X	X	X		07
MW-15 6W02	Grab	GW	—	10-20-20	0980	3	X	X	X		08
MW-16 6W02	Grab	GW	—	10-19-20	1615	3	X	X	X		09
DUP-1 6W02	Grab	GW	—	10-19-20	—	3	X	X	X		10

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Standard Turnaround

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS Y FedEx __ Courier _____

Tracking # 9186 2586 6384 6375 6386

Sample Receipt Checklist

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

	Date:	Time:		
Relinquished by : (Signature) Jonathan Heimansen	10-21-20	1605	Received by: (Signature)	Trip Blank Received: Yes (No) HCL / MeoH TBR
Relinquished by : (Signature)	10-21-20	1600	Received by: (Signature) FedEx	Temp: 1.6 +1.7 °C Bottles Received: 36
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) NRappao	Date: 10-22-20 Time: 900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

Chain of Custody Page 2 of 2

Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Report to:
Ingrid Setzler

Email To:
isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project #: KCBPU Nearman

Lab Project #: KCKAN02-MW NEARMAN2

Collected by (print): Jonathan Hernandez

Site/Facility ID #

P.O. #

Collected by (signature): [signature]

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STD

Pace Analytical® National Center for Testing & Innovation
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1276512

Table #

Acctnum: KCKAN02
Template: T109043
Prelogin: P803940
PM: 650 - Linda Cashman
PB:
Shipped Via: FedEX Ground

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3	TDS, pH 250mlHDPE-NoPres	Remarks	Sample # (lab only)
~~DUP-2~~		~~GW~~				~~3~~	~~X~~	~~X~~	~~X~~		
~~MS~~ (JH) MW-2A/GW02MS	Grab	GW	—	10-19-20	1100	3	X	X	X		-01
~~MS-D~~ (JH) MW-2A/GW02MSD	Grab	GW	—	10-19-20	1100	3	X	X	X		01

[signature] 10-21-20

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ________

Remarks: Standard Turnaround

pH ______ Temp ______
Flow ______ Other ______

Samples returned via: ___ UPS ✓ FedEx ___ Courier ______

Tracking # 9186 2506 6384/6375/6380

Sample Receipt Checklist
COC Seal Present/Intact: NP ✓ Y __N
COC Signed/Accurate: ✓Y __N
Bottles arrive intact: ✓Y __N
Correct bottles used: ✓Y __N
Sufficient volume sent: ✓Y __N
If Applicable
VOA Zero Headspace: __Y __N
Preservation Correct/Checked: ✓Y __N
RAD Screen <0.5 mR/hr: ✓Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)		
[signature]	10-21-20	1605	[signature]	Trip Blank Received: Yes / No (circled) HCL / MeoH TBR	
[signature]	10-21-20	1800	FedEx	Temp: 1.6+.1=1.7 °C	Bottles Received: 36
			Received for lab by: (Signature) M.Pippas	Date: 10-22-20	Time: 900

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK (circled)

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 16, 2020

Kansas City Board of Public Utilities

Sample Delivery Group:	L1276537
Samples Received:	10/22/2020
Project Number:	62801 BPU Nearman
Description:	groundwater

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager

TABLE OF CONTENTS

MW-2A/GW02 L1276537-01 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 11:00 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-3/GW02 L1276537-02 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 12:05 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-4/GW02 L1276537-03 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 12:50 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-8A/GW02 L1276537-04 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 08:50 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-10/GW02 L1276537-05 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 09:55 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-13/GW02 L1276537-06 Non-Potable Water

Collected by: Jonathan Hermanson | Collected date/time: 10/19/20 15:15 | Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-14/GW02 L1276537-07 Non-Potable Water

Collected by: Jonathan Hermanson
Collected date/time: 10/19/20 17:15
Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-15/GW02 L1276537-08 Non-Potable Water

Collected by: Jonathan Hermanson
Collected date/time: 10/20/20 09:20
Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

MW-16/GW02 L1276537-09 Non-Potable Water

Collected by: Jonathan Hermanson
Collected date/time: 10/19/20 16:15
Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN

DUP-1/GW02 L1276537-10 Non-Potable Water

Collected by: Jonathan Hermanson
Collected date/time: 10/19/20 00:00
Received date/time: 10/22/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1566757	1	10/28/20 12:05	11/06/20 14:10	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1573322	1	11/09/20 09:50	11/10/20 16:10	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1573322	1	11/09/20 09:50	11/10/20 16:10	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.

Linda Cashman
Project Manager

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.482	J	0.462	0.854	11/06/2020 14:10	WG1566757
(T) Barium	*104*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*105*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.727		0.717	1.19	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.244		0.255	0.336	11/10/2020 16:10	WG1573322
(T) Barium-133	*98.3*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.469	U	0.425	0.818	11/06/2020 14:10	WG1566757
(T) Barium	*97.3*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*94.5*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.118		0.583	1.05	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.118		0.158	0.229	11/10/2020 16:10	WG1573322
(T) Barium-133	*111*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.808	U	0.642	1.22	11/06/2020 14:10	WG1566757
(T) Barium	*98.5*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*99.6*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.34		1.17	1.44	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	2.34		0.530	0.219	11/10/2020 16:10	WG1573322
(T) Barium-133	*104*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.305	U	0.625	1.18	11/06/2020 14:10	WG1566757
(T) Barium	*91.8*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*110*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.919		1.01	1.53	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.919		0.388	0.35	11/10/2020 16:10	WG1573322
(T) Barium-133	*88.7*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.13	J	0.645	1.18	11/06/2020 14:10	WG1566757
(T) Barium	*98.4*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*102*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.26		0.833	1.46	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.129		0.188	0.283	11/10/2020 16:10	WG1573322
(T) Barium-133	*84.2*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	2.75		0.575	1	11/06/2020 14:10	WG1566757
(T) Barium	*100*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*97.8*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	3.19		0.861	1.33	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.434		0.286	0.332	11/10/2020 16:10	WG1573322
(T) Barium-133	*101*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	1.39		0.538	0.971	11/06/2020 14:10	WG1566757
(T) Barium	*99.1*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*106*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	1.51		0.692	1.18	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.124		0.154	0.212	11/10/2020 16:10	WG1573322
(T) Barium-133	*91.0*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	-0.428	U	0.603	1.14	11/06/2020 14:10	WG1566757
(T) Barium	*98.7*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*106*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.234		0.845	1.45	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.234		0.242	0.309	11/10/2020 16:10	WG1573322
(T) Barium-133	*75.2*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.957	J	0.562	1.03	11/06/2020 14:10	WG1566757
(T) Barium	*95.7*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*102*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	2.49		1.16	1.46	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	1.54		0.596	0.429	11/10/2020 16:10	WG1573322
(T) Barium-133	*74.7*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Radiochemistry by Method 904

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-228	0.496	J	0.515	0.952	11/06/2020 14:10	WG1566757
(T) Barium	*95.8*			*62.0-143*	*11/06/2020 14:10*	WG1566757
(T) Yttrium	*97.2*			*79.0-136*	*11/06/2020 14:10*	WG1566757

Radiochemistry by Method Calculation

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
Combined Radium	0.888		0.808	1.25	11/10/2020 16:10	WG1573322

Radiochemistry by Method SM7500Ra B M

Analyte	Result pCi/l	Qualifier	Uncertainty + / -	MDA pCi/l	Analysis Date date / time	Batch
RADIUM-226	0.392		0.293	0.297	11/10/2020 16:10	WG1573322
(T) Barium-133	*82.9*			*30.0-143*	*11/10/2020 16:10*	WG1573322

Method Blank (MB)

(MB) R3591810-1 11/05/20 09:45

Analyte	MB Result	MB Qualifier	MB MDA
	pCi/l		pCi/l
Radium-228	-0.0192	U	0.449
(T) Barium	*99.8*		
(T) Yttrium	*98.5*		

L1276537-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1276537-02 11/06/20 14:10 • (DUP) R3591810-5 11/05/20 09:45

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
	pCi/l	pCi/l		%			%	
Radium-228	-0.469	0.268	1	200	0.878	U	20	3
(T) Barium	*97.3*	*88.9*						
(T) Yttrium	*94.5*	*98.7*						

Laboratory Control Sample (LCS)

(LCS) R3591810-2 11/05/20 09:45

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	pCi/l	pCi/l	%	%	
Radium-228	5.00	5.25	105	80.0-120	
(T) Barium			*100*		
(T) Yttrium			*98.1*		

L1276537-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276537-01 11/06/20 14:10 • (MS) R3591810-3 11/05/20 09:45 • (MSD) R3591810-4 11/05/20 09:45

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.482	10.9	13.3	104	128	1	70.0-130			19.9		20
(T) Barium		*104*			*88.8*	*91.2*							
(T) Yttrium		*105*			*101*	*98.1*							

Method Blank (MB)

(MB) R3592737-1 11/10/20 16:10

Analyte	MB Result pCi/l	MB Qualifier	MB MDA pCi/l
Radium-226	-0.0141		0.114
(T) Barium-133	*61.1*		

L1282250-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1282250-01 11/10/20 16:10 • (DUP) R3592737-5 11/10/20 16:10

Analyte	Original Result pCi/l	DUP Result pCi/l	Dilution	DUP RPD %	DUP RER	DUP Qualifier	DUP RPD Limits %	DUP RER Limit
Radium-226	0.266	0.153	1	54.2	0.361		20	3
(T) Barium-133	*77.6*	*97.5*						

Laboratory Control Sample (LCS)

(LCS) R3592737-2 11/10/20 16:10

Analyte	Spike Amount pCi/l	LCS Result pCi/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Radium-226	5.02	5.71	114	80.0-120	
(T) Barium-133			*77.8*		

L1276537-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1276537-01 11/10/20 16:10 • (MS) R3592737-3 11/10/20 16:10 • (MSD) R3592737-4 11/10/20 16:10

Analyte	Spike Amount pCi/l	Original Result pCi/l	MS Result pCi/l	MSD Result pCi/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	MS RER	RPD Limits %
Radium-226	20.1	0.244	24.1	21.0	119	103	1	75.0-125			13.5		20
(T) Barium-133		*98.3*			*86.8*	*101*							

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.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

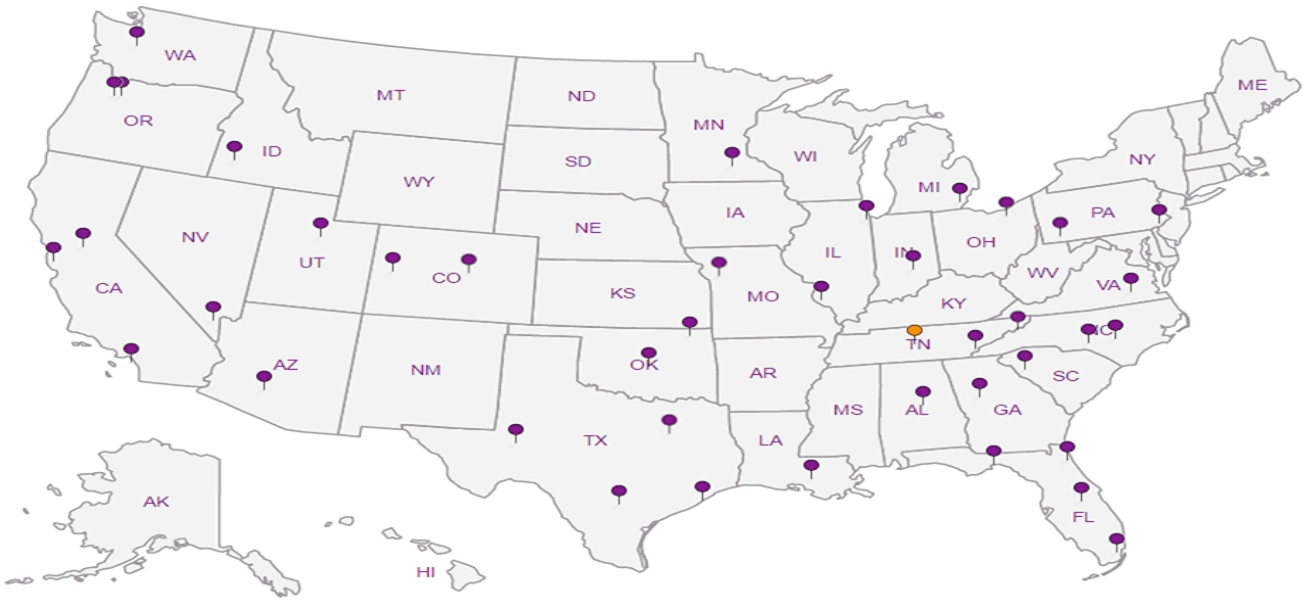
Third Party Federal Accreditations

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

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

Our Locations

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



Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
Attn: Ellen Bouse
300 N 65th Street
Kansas City, KS 66102

Pres Chk

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: groundwater

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # 62801 BPU Nearman

Lab Project # KCKAN02-MW NEARMAN

Collected by (print): Jonathan Hermanson

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STD

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Tota Rad,RA226,RA228 1L-HDPE-Add HNO3									Remarks	Sample # (lab only)
MW-2A / GW02	Grab	NPW	—	10-19-20	1100	2	X										-01
MW-3 / GW02	Grab	NPW	—	10-19-20	1205	2	X										02
MW-4 / GW02	Grab	NPW	—	10-19-20	1250	2	X										03
MW-8A / GW02	Grab	NPW	—	10-19-20	0850	2	X										04
MW-10 / GW02	Grab	NPW	—	10-19-20	0955	2	X										05
MW-13 / GW02	Grab	NPW	—	10-19-20	1515	2	X										06
MW-14 / GW02	Grab	NPW	—	10-19-20	1715	2	X										07
MW-15 / GW02	Grab	NPW	—	10-20-20	0920	2	X										08
MW-16 / GW02	Grab	NPW	—	10-19-20	1615	2	X										09
DUP-1 / GW02	Grab	NPW	—	10-19-20	—	2	X										10

Chain of Custody Page 1 of 2

Pace Analytical
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 127637

G197

Acctnum: KCKAN02
Template: T150051
Prelogin: P803939
PM: 650 - Linda Cashman
PB:
Shipped Via: FedEx Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Standard Turnaround

pH _____ Temp _____
Flow _____ Other _____

Samples returned via: __ UPS X FedEx __ Courier _____

Tracking # 9186 2506 6364 / 6375 / 6380

Sample Receipt Checklist

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

	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR	If preservation required by Login: Date/Time
Relinquished by : (Signature)	10-21-20	1605			
Relinquished by : (Signature)	10-21-20	1800	FedEx	Temp: 1.6t.1=1.7 °C Bottles Received: 24	
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 10-22-20 Time: 900	Hold: / Condition: NCF / OK

Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
Attn: Ellen Bouse
300 N 65th Street
Kansas City, KS 66102

Pres Chk

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: groundwater

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project # 62801 BPU Nearman

Lab Project # KCKAN02-MW NEARMAN

Collected by (print): Jonathan Thompson

Collected by (signature): Jonathan Thompson

Immediately Packed on Ice N X Y ___

Site/Facility ID #

P.O. #

Quote #

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed: STD

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Tota Rad,RA226,RA228 1L-HDPE-Add HNO3										Remarks	Sample # (lab only)
DUP-2		NPW				2	X											
MS (SB) MW-2A|6W02MS	Grab	NPW	—	10-19-20	1100	2	X											01
MSD (JT) MW-2A|6W02MSD	Grab	NPW	—	10-19-20	1100	2	X											01

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

SDG # 1276537

Table #

Acctnum: KCKAN02

Template: T150051

Prelogin: P803939

PM: 650 - Linda Cashman

PB:

Shipped Via: FedEX Ground

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: Standard turnaround

pH _____ Temp _____

Flow _____ Other _____

Samples returned via: __ UPS X FedEx __ Courier _____

Tracking #

Sample Receipt Checklist

COC Seal Present/Intact:	__NP	__Y __N
COC Signed/Accurate:		__Y __N
Bottles arrive intact:		__Y __N
Correct bottles used:		__Y __N
Sufficient volume sent:		__Y __N
If Applicable		
VOA Zero Headspace:		__Y __N
Preservation Correct/Checked:		__Y __N
RAD Screen <0.5 mR/hr:		__Y __N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
	10-21-20	1605		
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
	10-21-20	1800	FedEx	1.6+1.1=1.7 24
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:
			Keppas	10-22-20 900

If preservation required by Login: Date/Time

Hold: Condition: NCF / OK

10-20-20

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 11, 2020

Kansas City Board of Public Utilities

Sample Delivery Group:	L1294466
Samples Received:	12/09/2020
Project Number:	KCBPU Nearman
Description:	GW-Creek Bottom Ash Pond

Report To: Ingrid Setzler
300 N 65th Street
Kansas City, KS 66102

Entire Report Reviewed By:

Linda Cashman
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

TABLE OF CONTENTS

MW-8A L1294466-01 GW

Collected by: Jonathan Hermanson
Collected date/time: 12/08/20 15:00
Received date/time: 12/09/20 12:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICP) by Method 6010D	WG1588986	1	12/09/20 18:14	12/09/20 23:02	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020B	WG1588132	1	12/09/20 23:27	12/10/20 16:49	LD	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 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.

Linda Cashman
Project Manager

Metals (ICP) by Method 6010D

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.0339		0.0100	1	12/09/2020 23:02	WG1588986

Metals (ICPMS) by Method 6020B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Arsenic	0.0354		0.00200	1	12/10/2020 16:49	WG1588132

Method Blank (MB)

(MB) R3601977-1 12/09/20 21:47

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.00440	0.0100

Laboratory Control Sample (LCS)

(LCS) R3601977-2 12/09/20 21:49

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	1.00	0.912	91.2	80.0-120	

L1293037-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1293037-04 12/09/20 21:52 • (MS) R3601977-4 12/09/20 21:57 • (MSD) R3601977-5 12/09/20 21:59

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Arsenic	1.00	ND	0.921	0.910	91.5	90.4	1	75.0-125			1.25	20

Method Blank (MB)

(MB) R3602323-1 12/10/20 16:29

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Arsenic	U		0.000180	0.00200

Laboratory Control Sample (LCS)

(LCS) R3602323-2 12/10/20 16:33

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Arsenic	0.0500	0.0497	99.3	80.0-120	

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

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

Qualifier	Description

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

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

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

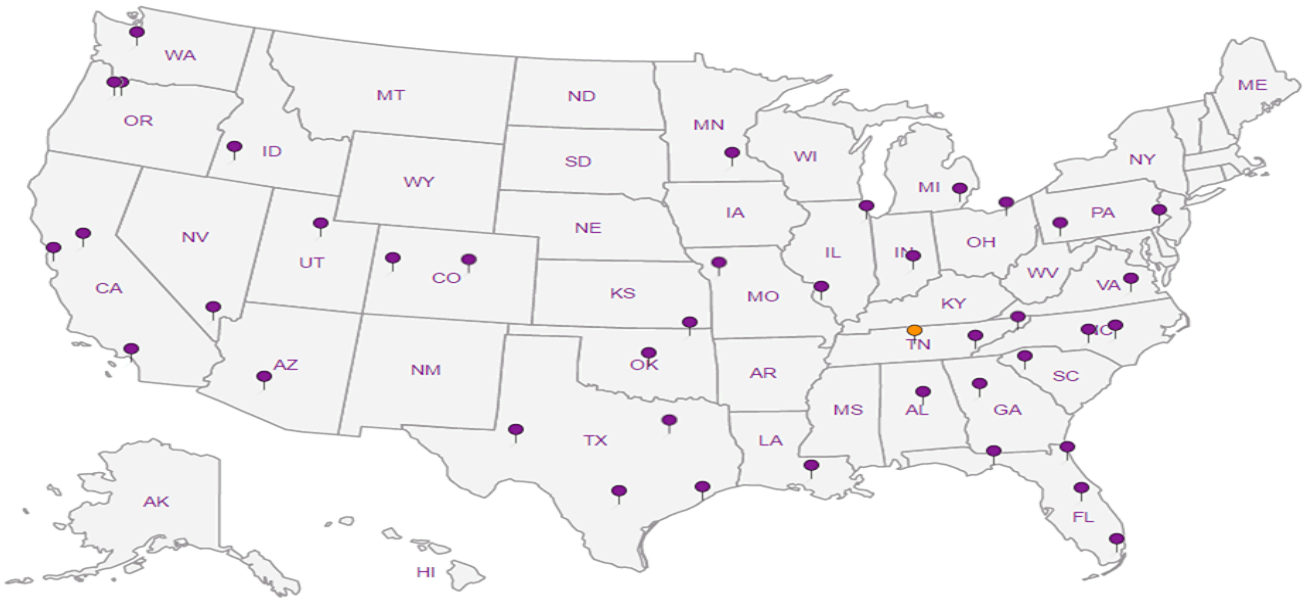
Third Party Federal Accreditations

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

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

Our Locations

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



Kansas City Board of Public Utilities

300 N 65th Street
Kansas City, KS 66102

Billing Information:
300 N 65th St
Kansas City, KS 66102

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

Pace Analytical® National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Ingrid Setzler

Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@b

Project Description: GW-Creek Bottom Ash Pond

City/State Collected:

Please Circle: PT MT CT ET

Phone: 913-573-9806

Client Project #: KCBPU Nearman

Lab Project #: KCKAN02-MW NEARMAN2

SDG # L1294466

C038

Collected by (print): Jonathan Hermanson

Site/Facility ID #

P.O. #

Acctnum: KCKAN02

Collected by (signature): [signature]

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
X Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Template: T178887

Prelogin: P815232

PM: 650 - Linda Cashman

PB:

Immediately Packed on Ice N ___ Y X

Date Results Needed: 12-11-20

Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Cl, Fl, Sulfate 125mlHDPE-NoPres	Metals 250mlHDPE-HNO3 Arsenic by 6010 L2 & 6020	TDS, pH 250mlHDPE-NoPres								Remarks	Sample # (lab only)
~~MW-8A~~		~~GW~~				~~3~~	~~X~~	~~X~~	~~X~~									
~~DUP-1~~		~~GW~~				~~3~~	~~X~~	~~X~~	~~X~~									
MW-8A	Grab	GW	-	12-8-20	1500	2		X										-01

[signature] 12-8-20

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other ______

Remarks: Rush - 1 Day Turnaround

pH ______ Temp ______
Flow ______ Other ______

Samples returned via: ___ UPS ___ FedEx X Courier X ______

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: ✓NP _Y _N
COC Signed/Accurate: ✓Y _N
Bottles arrive intact: ✓Y _N
Correct bottles used: ✓Y _N
Sufficient volume sent: _Y _N
If Applicable
VOA Zero Headspace: _Y _N
Preservation Correct/Checked: ✓Y _N
RAD Screen <0.5 mR/hr: ✓Y _N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	
[signature]	12-8-20	1610	[signature]	Trip Blank Received: Yes / (No) HCL / MeoH TBR
[signature]	12-8-20	1800	SWT	Temp: 1.5±2=1.3 °C Bottles Received: 2
			Received for lab by: (Signature) [signature]	Date: 12/9/20 Time: 1200

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Memorandum

Date: December 18, 2020

To: Brian Hoye

From: Kortney Blaufuss

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – October 2020
Project No. 88777

Groundwater samples were collected for analysis of assessment monitoring parameters at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. These samples were collected October 19 through 20, 2020. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace National) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

Parameters	Analytical Method
Metals	SW-846 6010D/6020B
Mercury	SW-846 7470A
Chloride, Fluoride, Sulfate	SW-846 9056A
Dissolved Solids	SM 2540 C-2011
pH	SW-846 9040C
Radium 226 and 228[2] (Combined)	SM 7500 Ra B M (radium-226) EPA 904.0 (radium-228)

Notes:
[1]Metals performed by SW-846 6010D include barium, beryllium, boron, cadmium, calcium, chromium, cobalt, lithium, and molybdenum. Metals performed by SW-846 6020B include antimony, arsenic, lead, selenium, and thallium.
[2]Project reporting requirements per the Sampling and Analysis Plan are for a combined radium-226/radium-228 concentration. These were measured separately, and the combined result was calculated and reported by the laboratory.

A Stage I data review was performed for Quality Assurance (QA)/Quality Control (QC) results in association with the samples collected to evaluate the results for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in the guidelines presented in *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI) (USEPA, 2017). Any data qualifiers added during the course of this review are presented on Table 1.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates on the COCs were present.

2. Requested Analyses Completed – All analyses were completed as requested for the appropriate parameters for the October groundwater sampling event.

3. Holding Times – The lab flagged all pH results for this sampling event with an "T8" to indicate the sample was received too close to the holding time expiration/past holding time for analysis. All reported pH results for these samples should be considered estimated (J). Note, the pH was also measured in the field and would provide a more accurate measurement as they are recorded on-site at the time of sample collection.

With the above exception, all other samples were extracted and/or analyzed within their respective holding time.

4. Sample Preservation – All samples were received by the laboratory below the recommended 2 to 6 degrees Celsius (ºC) sample preservation temperature range. Because no samples were received frozen, all were considered viable.

5. Laboratory Method Blanks – Method blanks were reviewed to determine the potential for sample cross contamination due to handling within the laboratory. With the following exceptions, no detections of target analytes were noted in the method blanks:

   - Radium-226 (-0.0141 pCi/L) was detected in the method blank in batch WG1573322. Because the radium-226 detection exhibited a negative result, it was considered non detect. No further actions or data qualifiers were necessary.

6. Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) – The LCS contains a matrix similar to that of the sample that has been spiked with known concentrations of target analytes. The LCS is prepared and analyzed by the same method as the samples. As a measure of analytical accuracy, the results of the LCS are compared against the known analyte concentrations in the spike to determine the percent recovery (REC). The purpose of the LCS is to determine the performance of the laboratory with respect to analyte recovery, independent of field sample matrix interference. For some methods, the lab performed a LCSD. The results between the LCS and LCSD were compared with each other for reproducibility using the relative percent difference (RPD). All LCS/LCSD RECs and/or RPDs were within their respective QC limits.

7. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Qualification is typically limited to the spiked sample for any MS/MSD issues, unless otherwise noted. Site-specific MS/MSDs were collected during each sampling event. The following summarizes these site-specific MS/MSD analyses:

   - MW-2A/GW02: The sulfate concentrations exceeded the upper calibration range of the instrument, and were flagged "E" by the laboratory to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

     Additionally, on this same parent sample, the spike amount for calcium was less than one-fourth the sample concentration for MW-2A/GW02. The lab flagged these results "V" to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

- MW-16/GW02: The spike amount for calcium was less than one-fourth the sample concentration for the noted spike parent sample. The lab flagged these results "V" to indicate this. No conclusion could be made regarding the accuracy of this MS/MSD. Analytical assessment was made by the associated LCS results, and no qualifiers were added based on this MS/MSD.

  All other site-specific MS/MSD results were within control limits.

8. Laboratory Duplicate Results – For some methods, laboratory duplicate analyses were performed. Laboratory duplicates provide information on the ability to reproduce lab results and to account for error introduced from handling, shipping, storage, preparation, and lab analysis. All project-specific laboratory duplicate results were within control limits, except the following:

   - MW-2A/GW02: The sulfate concentrations for the laboratory duplicates exceeded the upper calibration range of the instrument ("E" qualifier). The laboratory duplicate RPD between these two samples was within the QC limits, and no further review was necessary.

9. Field Duplicate Results – Field duplicate results provide information on the ability to reproduce field results and account for error introduced from handling, shipping, storage, preparation, and analysis of field samples. There are no specific USEPA criteria for qualifying data from field duplicate results. Depending upon the sample concentration, one of the following criteria based upon NFGI is applicable:

   - Is the compound detected in both portions?
   - If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.
   - If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.
   - If the radium results are reported above their minimum detectable concentration (MDC), the normalized difference (also called the relative error ratio) between the duplicate pair was calculated. The maximum normalized difference is 1.96 for the radium samples.

   One field duplicate pair was collected for the October 2020 sampling event. Table 2 presents the side-by-side comparison of the field duplicate results. Although some elevated RPDs were noted, qualifiers are not typically added based on the field duplicate review unless significant issues were noted. The higher of the two concentrations are considered more viable for use in reporting.

10. Detection and Quantitation Limits – In one or more samples the sulfate analysis required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based

on these dilutions.

11. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid, as qualified, for use in reporting the results of this investigation.

Attachments

Table 1: Data Qualifiers
Table 2: Field Duplicate Results - Detections Only

Table 1
Data Qualifiers
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – October 2020

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
All Samples in SDG L1276512		pH	J	Holding time exceeded (see text)

Notes:

J - Estimated Value
QC - Quality Control
SDG - Sample Delivery Group

Table 2
Field Duplicate Results - Detections Only
Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas
Nearman Creek Power Station Bottom Ash Pond – October 2020

	Sample Identification:	MW-2A/GW02	DUP-1/GW02	
	Date Sampled:	10/19/2020	10/19/2020	
	SDG(s):	L1276512-01 L1276537-01 (radium)	L1276512-10 L1276537-10 (radium)	Meets QC Criteria
Parameter	**Unit**	**Result**	**Result**	
Arsenic	mg/l	0.00289	0.00475	Yes
Barium	mg/l	0.171	0.116	RPD 38%
Boron	mg/l	0.221	1.2	RPD 137%
Calcium	mg/l	168	170	Yes
Chloride	mg/l	12.7	12.1	Yes
Dissolved Solids	mg/l	622	736	Yes
Fluoride	mg/l	0.234	0.168	Yes
Lithium	mg/l	0.0302	0.0412	Yes
Sulfate	mg/l	113	144	RPD 24%
Combined Radium (including +/- uncertainty)	pCi/l	0.727 (+/- 0.717)	0.888 (+/- 0.808)	Yes

Notes:

mg/l - milligrams per liter
pCi/l - picoCuries per liter
QC - Quality Control
RPD - relative percent difference
SDG - Sample Delivery Group
su - standard unit

CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com