



2019 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond



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

Project No. 88777 1/31/2020



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prepared for

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

Kansas City, Kansas

Project No. 88777

1/31/2020

prepared by

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LIST OF ABBREVIATIONS

Abbreviation

Term/Phrase/Name

BA Pond	Bottom Ash Pond
BPU	Kansas City, Kansas Board of Public Utilities
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CCR	Coal Combustion Residuals
CCR Final Rule	Hazardous and Solid Waste Management System; Disposal of Coal
	<i>Combustion Residuals (CCR) from Electric Utilities; Final Rule</i> , dated April 17, 2015, amended July 30, 2018
CFR	Code of Federal Regulations
Groundwater Monitoring	Groundwater Monitoring Plan for the Nearman Creek Power Station
Program	Bottom Ash Pond
GWPS	groundwater protection standard
mg/L	milligrams per liter
NCPS	Nearman Creek Power Station
NTU	Nephelometric Turbidity Unit
Pace	Pace Analytical Laboratory
Report	Annual Groundwater Monitoring and Corrective Action Report
SAP	Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond
Site	Nearman Creek Power Station
SSI	statistically significant increase
USEPA	United States Environmental Protection Agency

1.0 INTRODUCTION

This Annual Groundwater Monitoring and Corrective Action Report (Report) was prepared by Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) on behalf of Kansas City Board of Public Utilities (BPU) to present groundwater monitoring activities performed under 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 (USEPA, 2015 and USEPA, 2018) (Final CCR Rule) at the existing utility bottom ash pond (hereinafter referred to as the "BA Pond") located at BPU's Nearman Creek Power Station (NCPS or Site). This Report has been prepared to provide an account of groundwater monitoring activities 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 2019.
- 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.

1.1 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 third annual Report for the BA Pond.

1.2 Overview

This Report is organized in sections as summarized below:

- Section 1.0 Introduction
- Section 2.0 Groundwater Monitoring Activities and Results- Section 2.0 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 3.0 Statistical Analysis Section 3.0 discusses statistical analyses of data generated during the reporting period.
- Section 4.0 Certifications and Notifications to the Operating Record Section 4.0 lists certifications and notifications that were prepared during the reporting period.
- Section 5.0 Key Activities for the Upcoming Year Section 5.0 presents an account of anticipated activities for 2020.
- Section 6.0 References Section 6.0 includes a full bibliography for references made within this report.

Figure 1-1 presents the location of the BA Pond relative to the NCPS. A description of the site setting is presented in Section 2.0 of the Groundwater Monitoring Program.

2.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS

2.1 Description of the Groundwater Monitoring Program

On January 1, 2019, the BA Pond was in assessment monitoring. Prior to 2019, a total of 9 detection monitoring events and 2 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) and the 2018 Annual Groundwater Monitoring and Corrective Action Study Report (Burns & McDonnell, 2019a)

In 2019, 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.

- July 2019 Groundwater samples were collected from all wells presented in Figure 2-1, including: Monitoring Wells MW-2A, MW-3, MW-4, MW-8A, MW-10, MW-13, MW-14, MW-15, and MW-16 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 is summarized in the September 27, 2019 Notification Regarding Groundwater Protection Standards (Burns & McDonnell, 2019b), indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs.
- November 2019 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 July 2019 sampling event (herein after referred to as the "2019 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

is summarized in Appendix B, indicated that none of the parameters listed in Appendix IV of 40 CFR 257.95 were detected at concentrations above their respective GWPSs.

2.2 Monitoring Well Redevelopment

In 2019, the Missouri River crested at major and near major flood stage on two separate occasions prior to the July groundwater sampling activities. While the Missouri River is at and near major flood stage, river water exceeds the elevation of each monitoring well used for CCR activities. Due to the flooding, it was likely that river water and/or river sediment entered BA Pond monitoring wells with the potential to bias and compromise groundwater analytical results. Succeeding each flooding event, Burns & McDonnell and BPU personnel developed each monitoring well to stabilization criteria outlined in the *Sampling and Analysis Plan for the Nearman Creek Power Station Bottom Ash Pond* (Burns & McDonnell, 2016b). This was done to ensure that groundwater collected during sampling activities was representative of the targeted aquifer in attempt to limit bias that might have been caused from the river's flooding. Monitoring well development field paperwork is provided in Appendix C.

2.3 Groundwater Sampling Activities

During the 2019 sampling events identified in Section 2.1, the depth to groundwater was gauged prior to sampling using a decontaminated water level meter. The measured depth to groundwater and calculated water level elevations for each event are presented on Tables 2-1 and 2-2. Once gauged, 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). Note, turbidity stabilized above 5 NTUs at Monitoring Wells MW-10 (7.97) and MW-13 (11.12) during the July sampling event and stabilized above 5 NTUs at Monitoring Well MW-8A (10.84) during the November sampling event. Once groundwater stabilized, the BA Pond monitoring wells were sampled for the parameters presented in Section 2.1 using the analytical methods presented on Table 2-3. Samples were maintained in accordance with the SAP included in the Groundwater Monitoring Program and were provided to Pace Analytical Laboratory (Pace) for analysis. No issues were encountered during the sampling events performed at the BA Pond in 2019. Monitoring well sampling forms for each of the groundwater monitoring events are presented in Appendix D. While analytical data are summarized in Table 2-3, copies of laboratory analytical data packages are included in Appendix E. All laboratory data was validated by Burns & McDonnell chemists in accordance with the SAP. Copies of data validation reports are provided in Appendix E, and all data are considered suitable for reporting as qualified. None of the detected parameters from the July nor the November sampling events exceeded their respective GWPS as presented in Table 2-3.

As presented on Figures 2-2 and 2-3, the primary groundwater gradients observed during the reporting period were predominantly to the northwest, generally toward Monitoring Well MW-14.

3.0 STATISTICAL ANALYSIS

In accordance with 40 CFR 257.93(h)(2), statistical analysis of the groundwater water quality data collected from October 2015 through November 20, 2019 was completed on August 26, 2020 and January 07, 2020, within 90 days following analysis of the samples collected during the July 2019 and November 2019 sampling events, respectively. The results of these assessments were used to update GWPSs. As presented in Appendix B, the following parameters were observed at concentrations above calculated background values in downgradient monitoring wells, but below their respective GWPSs.

July 2019 Sampling Event	November 2019 Sampling Event
Boron (MW-8A)	Boron (MW-8A and MW-10)
Molybdenum (MW-8A)	Chloride (MW-8A)
Sulfate (MW-8A)	Molybdenum (MW-8A)
	Sulfate (MW-8A)

4.0 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:

- 2018 Annual Groundwater Monitoring and Corrective Action Report for the Nearman Creek Power Station Bottom Ash Pond (Burns & McDonnell, 2019a)
- Documentation of the development of monitoring wells and other measurements, as required by 257.91(e)(1).
- Copies of analytical data reports as required by the CCR groundwater monitoring program.
- Updated Groundwater Monitoring System Certification for the KCBPU Nearman Creek Power Station Bottom Ash Pond (Burns & McDonnell, 2019c), included in Appendix A
- GWPSs
- Statistical Evaluation of July 2019 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond (Burns & McDonnell, 2019d)
- Notification Regarding Groundwater Protection Standards (Burns & McDonnell, 2019b)

5.0 KEY ACTIVITIES FOR THE UPCOMING YEAR

Groundwater monitoring and statistical assessments are expected to be performed in 2020 as required by the BA Pond assessment monitoring program. BPU plans to evaluate the existing BA Pond groundwater monitoring network in 2020, based on activities conducted in 2019. Additionally, BPU plans to initiate closure of the BA Pond by removal of CCR in 2020.

6.0 **REFERENCES**

- Burns & McDonnell Engineering Company, Inc. (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. 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, 2019b. Notification Regarding Groundwater Protection Standards. September 27.
- Burns & McDonnell, 2019c. Updated Groundwater Monitoring System Certification for the KCBPU– Nearman Creek Power Station Bottom Ash Pond. April 29.
- Burns & McDonnell, 2019d. Statistical Evaluation of July 2019 Assessment Monitoring Data Nearman Creak Power Station Bottom Ash Pond. September 27.
- 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. <u>https://www.federalre</u> gister.gov/documents/2018/07/30/2018-16262/hazardous-and-solid-waste-management-systemdisposal-of-coal-combustion-residuals-from-electric-utilities

TABLES

Table 2-1 Monitoring Well Gauging Data - July 2, 2019 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	7/2/2019	747.86	31.68	NM	6.33	741.53
MW-3	7/2/2019	750.44	34.7	NM	8.27	742.17
MW-4	7/2/2019	746.90	31.75	NM	4.62	742.28
MW-8A	7/2/2019	750.10	35.17	NM	9.99	740.11
MW-10	7/2/2019	745.25	29.5	NM	4.40	740.85
MW-13	7/2/2019	747.81	33.48	NM	4.50	743.31
MW-14	7/2/2019	749.18	33.27	NM	14.10	735.08
MW-15	7/2/2019	752.88	32.7	NM	10.10	742.78
MW-16	7/2/2019	748.43	32.59	NM	5.02	743.41

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

NM- Not measured

Table 2-2 Monitoring Well Gauging Data - November 25, 2019 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	11/25/2019	747.86	31.68	31.70	12.63	735.23
MW-3	11/25/2019	750.44	34.7	34.51	14.95	735.49
MW-4	11/25/2019	746.90	31.75	31.98	11.52	735.38
MW-8A	11/25/2019	750.10	35.17	35.27	15.94	734.16
MW-10	11/25/2019	745.25	29.5	26.60	10.61	734.64
MW-13	11/25/2019	747.81	33.48	33.47	10.74	737.07
MW-14	11/25/2019	749.18	33.27	33.27	17.43	731.75
MW-15	11/25/2019	752.88	32.7	31.75	15.62	737.26
MW-16	11/25/2019	748.43	32.59	32.64	12.19	736.24

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

					Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3	MW-3
Analytical Method	Analvte	Unit	Calculated		Sample Date ASD	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	3/8/2018
,	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Unit	Background	GWPS ²	Background										<u> </u>
Appendix III - Detection	Monitoring		Limit ¹		Limit ³										
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	NS
6010B	Calcium	mg/l	252.1			194	199	201	235	218	212	191	218	195	NS
9056MOD	Chloride	mg/l	24.82			4.45	4.65	4.64	4.37	5.23	5.88	7.83	6.69	5.63	NS
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	NS
9040C	рН	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	NS
In Situ	рН	su	6.34 - 8.60			6.93	6.7	6.33	6.87	6.74	6.75	6.68	6.63	6.6	6.45
9056MOD	Sulfate	mg/l	198.7			109	114	121	117	121	130	115	143	106	NS
2540 C-2011	Total Dissolved Solids	mg/l	959.2			717	749	771	845	697	831	715	827	733	NS
Appendix IV - Assessme	ent 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
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	0.00219
6010B	Barium	mg/l	0.274	2		0.151	0.152	0.154	0.197	0.173	0.165	0.145	0.159	0.177	0.164
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
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
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
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
9056MOD	Fluoride	mg/l	0.486	4		0.158	0.125	0.139	0.1 U	0.138	0.176	0.136	0.141	0.157	0.134
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
6010B	Lithium	mg/l	0.0708	0.0708		0.0441	0.0525	0.0528	0.0536	0.0551	0.0542	0.0548	0.0461	0.0486	0.0608
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
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
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	0.01 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
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		0.637	1.63	2.09	0.630 J	1.06	4.26	1.27 J	NA	1.27 J	1.06

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

- BA = Bottom Ash
- 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

NA = Not Available

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

					Sample Location	MW-3	MW-3	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4
					Sample Date	6/4/2018	10/2/2018	11/20/2018	7/1/2019	11/26/2019	10/30/2015	1/27/2016	4/27/2016	7/25/2016	10/25/2016	1/24/2017
Analytical Method	Analyte	Unit	Calculated		ASD											
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
6010B	Boron	mg/l	0.272			0.212	0.2 U	NS	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2
6010B	Calcium	mg/l	252.1			215	207	NS	136	181	200	191	206	181 V	186	207
9056MOD	Chloride	mg/l	24.82			5.74	7.13	NS	7.37	7.35	9.72	8.98	13.4	3.9	6.27	11.2
9056MOD	Fluoride	mg/l	0.486			0.173 J+	0.186	NS	0.218	0.180	0.112	0.12	0.108	0.104	0.131	0.172
9040C	рН	su	6.56 - 8.29			6.94 J	6.83 J	NS	7.23 J	6.84 J	6.92 J	7.02 J	6.84 J	6.87 J	7.30 J	6.87 J
In Situ	рН	su	6.34 - 8.60			7.18	6.66	6.6	6.74	6.74	6.8	6.7	6.11	6.81	6.86	6.81
9056MOD	Sulfate	mg/l	198.7			137	136	NS	66.9	93.4	116	109	128	74.5	96.2	148
2540 C-2011	Total Dissolved Solids	mg/l	959.2			788	747	NS	506	638	780	736	755	683	837	774
Appendix IV - Assessme	ent Monitoring							-	-	-	-		-		-	-
6010B/6020	Antimony	mg/l				NS	NS	NS	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	0.0021	0.002 U	0.00216	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	0.274	2		0.159	0.163	NS	0.162	0.183	0.16	0.148	0.152	0.141	0.149	0.173
6010B	Beryllium	mg/l				NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Cadmium	mg/l				NS	NS	NS	0.002 U	NS	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Chromium	mg/l				NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
6010B	Cobalt	mg/l				NS	NS	NS	0.01 U	NS	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.486	4		0.173 J+	0.186	NS	0.218	0.18	0.112	0.12	0.108	0.104	0.131	0.172
6010B/6020	Lead	mg/l				NS	NS	NS	0.002 U	NS	0.005 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U
6010B	Lithium	mg/l	0.0708	0.0708		0.0606	0.0481	NS	0.0239	0.0462	0.0372	0.0439	0.0418	0.0425	0.0464	0.0411
7470A	Mercury	mg/l				NS	NS	NS	0.0002 U	NS	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	NS	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		NS	NS	NS	0.002 U	0.01 U	0.0423	0.0562	0.00642	0.0315	0.0383	0.0155
6010B/6020	Thallium	mg/l				NS	NS	NS	0.002 U	NS	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	3.2	5		1.62	0.555 J	NS	2.07	1.01	0.266	1.16	0.46	0.700 J	0.756	0.18 U*

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

BA = Bottom Ash

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

NA = Not Available

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

					Sample Location	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-4	MW-2A
					Sample Date	4/24/2017	7/26/2017	9/14/2017	3/8/2018	6/4/2018	10/2/2018	11/20/2018	7/2/2019	11/26/2019	10/29/2015
Analytical Method	Analyte	Unit	Calculated	2	ASD										
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³										
6010B	Boron	mg/l	0.272			0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U
6010B	Calcium	mg/l	252.1			224	193	186	NS	214 O1 V	176	NS	89.9	128	223
9056MOD	Chloride	mg/l	24.82			12.4	6.6	4.92	NS	3.59	1.95	NS	8.22	6.94	7.54
9056MOD	Fluoride	mg/l	0.486			0.119	0.135	0.148 J-	NS	0.156 J+	0.177	NS	0.314	0.235	0.129
9040C	рН	su	6.56 - 8.29			6.86 J	6.71 J	6.88 J	NS	6.93 J	6.91 J	NS	7.56 J	7.10 J	6.86 J
In Situ	рН	su	6.34 - 8.60			6.69	6.79	6.7	6.68	6.94	6.80	6.7	7.29	6.9	6.96
9056MOD	Sulfate	mg/l	198.7			148	117	100	NS	116	87	NS	64.1	59.7	227
2540 C-2011	Total Dissolved Solids	mg/l	959.2			840	736	732	NS	741	619	NS	358	481	852
Appendix IV - Assessme	ent Monitoring						-	-	-	-	-	-	-		-
6010B/6020	Antimony	mg/l				0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	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	0.00361
6010B	Barium	mg/l	0.274	2		0.151	0.14	0.146	0.135	0.134	0.121	NS	0.112	0.134	0.127
6010B	Beryllium	mg/l				0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U
6010B	Cadmium	mg/l				0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U
6010B	Chromium	mg/l				0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS	0.01 U
6010B	Cobalt	mg/l				0.01 U	0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	NS	0.0112
9056MOD	Fluoride	mg/l	0.486	4		0.119	0.135	0.148 J-	0.132	0.156 J+	0.177	NS	0.314	0.235	0.129
6010B/6020	Lead	mg/l				0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS	0.005 U
6010B	Lithium	mg/l	0.0708	0.0708		0.0442	0.0353	0.0428	0.0458	0.051	0.0304	NS	0.0177	0.0265	0.0357
7470A	Mercury	mg/l				0.0002 U	0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	NS	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	NS	0.005 U	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562		0.002 U	0.022	0.0186	0.01 U	NS	NS	NS	0.002 U	0.01 U	0.01 U
6010B/6020	Thallium	mg/l				0.002 U	0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	NS	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		0.191	NA	0.191 J	0.168	0.876	0.186 J	NS	1.66 J	0.115	0.763

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

- BA = Bottom Ash
- 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

NA = Not Available

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

					Sample Location	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-2	MW-2A	DUP-1
					Sample Date	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		ASD	Duplic	ate Pair					Duplico	ate Pair	Duplice	ate Pair
Appendix III - Detection	Monitoring		Background	GWPS ²	Background										
	<u> </u>		Limit ¹		Limit ³		T		T	1	1	1	1		-
6010B	Boron	mg/l	0.272			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	252.1			208	206	200 V	231	163	193	128	130	138	140
9056MOD	Chloride	mg/l	24.82			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			0.159	0.154	0.158	0.114	0.13	0.187	0.181	0.191	0.189	0.192
9040C	рН	su	6.56 - 8.29			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	pН	su	6.34 - 8.60			6.8	6.8	6.26	6.63	6.86	6.75	6.85	6.85	6.84	6.84
9056MOD	Sulfate	mg/l	198.7			180	182	153	196	127	153	81.6	82.5	74.6	74.7
2540 C-2011	Total Dissolved Solids	mg/l	959.2			811	783	848	865	616	734	508	478	512	506
Appendix IV - Assessme	ent Monitoring						-		-	-	-		-		-
6010B/6020	Antimony	mg/l				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	0.00468	0.00465	0.00416	0.00492	0.00499	0.00541	0.00381	0.00326	0.00578	0.00553
6010B	Barium	mg/l	0.274	2		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				
6010B	Cadmium	mg/l				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				
6010B	Cobalt	mg/l				0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U				
9056MOD	Fluoride	mg/l	0.486	4		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				0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U				
6010B	Lithium	mg/l	0.0708	0.0708		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				
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				
6010B/6020	Selenium	mg/l	0.0562	0.0562		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				
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		2.45	1.21	1.33	1.68	0.72	1.7	0.214 J	0.597 J	NA	NA

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

- BA = Bottom Ash
- 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
- NA = Not Available
- 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

				S	Sample Location	MW-2A	DUP-1	MW-2A	MW-2A	MW-2A	MW-2A	MW-2A	DUP-1	MW-2A	DUP-1
					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
Analytical Method	Analyte	Unit	Calculated		ASD	Duplico	ite Pair					Duplico	ate Pair	Duplica	ite Pair
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³										
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
6010B	Calcium	mg/l	252.1			155	155	NS	156	163	NS	127 V	127	122	123
9056MOD	Chloride	mg/l	24.82			6.26	6.33	NS	4.34	5.12	NS	8.82	8.96	14.0	13.9
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
9040C	рН	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
In Situ	рН	su	6.34 - 8.60			6.8	6.8	6.39	6.81	6.80	6.7	6.85	6.85	7.01	7.01
9056MOD	Sulfate	mg/l	198.7			89	89.6	NS	53.8	68.5	NS	86.3	87.2	108	109
2540 C-2011	Total Dissolved Solids	mg/l	959.2			571	568	NS	537	580	NS	462	462	471	436
Appendix IV - Assessme	ent 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
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
6010B	Barium	mg/l	0.274	2		0.116	0.115	0.184	0.147	0.157	NS	0.11	0.107	0.116	0.115
6010B	Beryllium	mg/l				0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
6010B	Cadmium	mg/l				0.002 U	0.002 U	0.002 U	NS	NS	NS	0.002 U	0.002 U	NS	NS
6010B	Chromium	mg/l				0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS
6010B	Cobalt	mg/l				0.01 U	0.01 U	0.01 U	NS	NS	NS	0.01 U	0.01 U	NS	NS
9056MOD	Fluoride	mg/l	0.486	4		0.186	0.181	0.166	0.274 J+	0.208	NS	0.23	0.229	0.274	0.271
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
6010B	Lithium	mg/l	0.0708	0.0708		0.0294	0.0298	0.0372	0.0352	0.027	NS	0.0204	0.0202	0.0205	0.0223
7470A	Mercury	mg/l				0.0002 U	0.0002 U	0.0002 U	NS	NS	NS	0.0002 U	0.0002 U	NS	NS
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
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
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
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	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

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

BA = Bottom Ash

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

NA = Not Available

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

					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		ASD	Duplic	ate Pair		Duplico	ate Pair						
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³											
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	252.1			186	185	168	186	182	204	156	146	126	161	153
9056MOD	Chloride	mg/l	24.82			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	рН	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	рН	su	6.34 - 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	198.7			491	598	471	520	522	453	412	386	383	477	380
2540 C-2011	Total Dissolved Solids	mg/l	959.2			1180	1130	1060	1170	1170	1190	1040	935	880	1020	1000
Appendix IV - Assessme	ent 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	0.274	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	0.486	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	0.0708	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	3.2	5		0.36	0.298	1.44	0.673	0.127	1.45	1.11	0.536	1.07 J	NA	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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

B = The same analyte is found in the associated blank

BA = Bottom Ash

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

NA = Not Available

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

					Sample Location	MW-8A	DUP-1	MW-8A	DUP-1	MW-8A	MW-8A	MW-8A	MW-8A	MW-10	MW-10
					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	10/29/2015	1/27/2016
Analytical Method	Analyte	Unit	Calculated		ASD	Duplic	ate Pair	Duplico	ate Pair						
Appendix III - Detection	Monitoring		Background Limit ¹	GWPS ²	Background Limit ³										
6010B	Boron	mg/l	0.272			NS	NS	2.44	2.47	2.31	NS	1.06	2.09 O1	1.08	0.907
6010B	Calcium	mg/l	252.1			NS	NS	129	129	122	NS	105	115 O1	217	213
9056MOD	Chloride	mg/l	24.82			NS	NS	25.7	25.5	26.2	NS	21.0	27.0	30.2	17
9056MOD	Fluoride	mg/l	0.486			NS	NS	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.327	0.104
9040C	рН	su	6.56 - 8.29			NS	NS	6.97 J	6.98 J	6.95 J	NS	7.25 J	7.11 J	6.82 J	6.89 J
In Situ	рН	su	6.34 - 8.60			6.91	6.91	6.86	6.86	6.86	6.6	7.14	7.07	7.03	7.1
9056MOD	Sulfate	mg/l	198.7			NS	NS	353	360	419	NS	223	324	623	227
2540 C-2011	Total Dissolved Solids	mg/l	959.2			NS	NS	853	881	920	NS	636	787	1130	916
Appendix IV - Assessme	ent Monitoring						-		-			-	-	-	
6010B/6020	Antimony	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	0.002 U	0.002 U	0.002 U
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	0.00743	0.00489
6010B	Barium	mg/l	0.274	2		0.0657	0.065	0.0559	0.0548	0.0602	NS	0.201	0.176 O1	0.183	0.106
6010B	Beryllium	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Cadmium	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.002 U	0.002 U
6010B	Chromium	mg/l				0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
6010B	Cobalt	mg/l				0.01 U	0.01 U	NS	NS	NS	NS	0.01 U	NS	0.01 U	0.01 U
9056MOD	Fluoride	mg/l	0.486	4		0.348	0.347	0.453 J+	0.441 J+	0.394	NS	0.251	0.329	0.327	0.104
6010B/6020	Lead	mg/l				0.002 U	0.002 U	NS	NS	NS	NS	0.002 U	NS	0.005 U	0.002 U
6010B	Lithium	mg/l	0.0708	0.0708		0.029	0.0281	0.0262	0.031	0.0174	NS	0.0277	0.0188	0.0501	0.0571
7470A	Mercury	mg/l				0.0002 U	0.0002 U	NS	NS	NS	NS	0.0002 U	NS	0.0002 U	0.0002 U
6010B	Molybdenum	mg/l	0.005	0.100		0.00833	0.00816	0.00865	0.00876	0.00967	NS	0.00524	0.00953	0.005 U	0.005 U
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	0.01 U	0.002 U
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
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		0.628	0.308	1.61	1.54	0.589 J	NS	0.107 J	0.491	0.442	2.32

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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 Alternate Source Demonstration dated December 12, 2018.

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- BA = Bottom Ash
- J = Result qualified as estimated

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MCL = Maximum Contaminant Level

mg/l = milligram per liter

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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

					Sample Location	MW-10	DUP-1	MW-10	DUP-1	MW-10	DUP-1	MW-10	MW-10	MW-10	MW-10
					Sample Date	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		ASD	Duplicate Pair				Duplicate Pair					
Appendix III - Detection		Background Limit ¹	GWPS ²	Background Limit ³								·		- -	
6010B	Boron	mg/l	0.272			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	252.1			179	178	218	217	217	221	191	157	193	195
9056MOD	Chloride	mg/l	24.82			21.9	21.8	20.4	20.4	18	46.3	23.2	21.6	26	22.6
9056MOD	Fluoride	mg/l	0.486			0.125	0.105	0.125	0.1 U	0.111	0.101	0.183	0.161	0.143	0.144
9040C	рН	su	6.56 - 8.29			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	рН	su	6.34 - 8.60			6.5	6.5	6.66	6.66	6.7	6.7	6.78	6.87	6.7	6.64
9056MOD	Sulfate	mg/l	198.7			220	226	223	217	228	75	238	193	280	258
2540 C-2011	Total Dissolved Solids	mg/l	959.2			797	820	905	903	911	739	845	709	852	880
Appendix IV - Assessme	ent 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
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0135	0.0115	0.00519	0.00536	0.00351	0.00365	0.0107	0.0143	0.00612	0.00635
6010B	Barium	mg/l	0.274	2		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
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
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
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
9056MOD	Fluoride	mg/l	0.486	4		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				0.002 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	0.0708	0.0708		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
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
6010B/6020	Selenium	mg/l	0.0562	0.0562		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
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		1.77	1.16	0.550 J	0.520 J	0.877 J	0.603 J	0.253	0.848 J	NA	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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 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

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- 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
- NA = Not Available
- 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

					Sample Location	MW-10	MW-10	MW-10	DUP-1	MW-10	DUP	MW-10	MW-10	MW-13	MW-13	MW-13
					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	10/1/2018	11/19/2018	7/2/2019
Analytical Method	Analyte	Unit	Calculated		ASD			Duplico	nte Pair							
Appendix III - Detection Monitoring			Background Limit ¹	GWPS ²	Background Limit ³			<u>.</u>								
6010B	Boron	mg/l	0.272			NS	1.5	1.22	1.23	NS	NS	0.2 U	1.36	0.2 U	NS	0.2 U
6010B	Calcium	mg/l	252.1			NS	168	179	179	NS	NS	101	198	95	NS	90.9
9056MOD	Chloride	mg/l	24.82			NS	19.6	18.6	18.7	NS	NS	11.3	16.3	19.5	NS	22.1
9056MOD	Fluoride	mg/l	0.486			NS	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.38	NS	0.317
9040C	рН	su	6.56 - 8.29			NS	6.94 J	6.98 J	6.96 J	NS	NS	7.47 J	6.91 J	7.1 J	NS	7.08 J
In Situ	рН	su	6.34 - 8.60			6.41	6.61	6.80	6.80	6.6	6.6	7.2	6.74	8.67	6.979	6.79
9056MOD	Sulfate	mg/l	198.7			NS	214	234	232	NS	NS	104	180	155	NS	154
2540 C-2011	Total Dissolved Solids	mg/l	959.2			NS	748	822	808	NS	NS	441	832	542	NS	520
ppendix IV - Assessme	ent Monitoring						-	-							-	
6010B/6020	Antimony	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	0.002 U	NS	NS	0.002 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	0.0252	0.024	0.00957
6010B	Barium	mg/l	0.274	2		0.0993	0.107	0.129	0.128	NS	NS	0.0725	0.138	0.205	NS	0.235
6010B	Beryllium	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	NS	NS	0.002 U
6010B	Cadmium	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	NS	NS	0.002 U
6010B	Chromium	mg/l				0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	NS	NS	0.01 U
6010B	Cobalt	mg/l				0.01 U	NS	NS	NS	NS	NS	0.01 U	NS	NS	NS	0.01 U
9056MOD	Fluoride	mg/l	0.486	4		0.164	0.235 J+	0.219	0.217	NS	NS	0.26	0.146	0.38	NS	0.317
6010B/6020	Lead	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	NS	NS	0.002 U
6010B	Lithium	mg/l	0.0708	0.0708		0.0418	0.0445	0.0281	0.0286	NS	NS	0.0165	0.0483	0.0296	NS	0.0314
7470A	Mercury	mg/l				0.0002 U	NS	NS	NS	NS	NS	0.0002 U	NS	NS	NS	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	NS	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	NS	NS	0.002 U
6010B/6020	Thallium	mg/l				0.002 U	NS	NS	NS	NS	NS	0.002 U	NS	NS	NS	0.002 U
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		0.102	1.18	0.35 J	0.35	NS	NS	0.414	2.06	0.765 J	NS	1.18 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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 assessment monitoring event.

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

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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

				5	Sample Location Sample Date	MW-13 11/26/2019	MW-14 10/1/2018	MW-14 11/19/2018	MW-14 7/2/2019	MW-14 11/26/2019	MW-15 10/1/2018	MW-15 11/19/2018	MW-15 7/1/2019	MW-15 11/26/2019	MW-16 11/19/2018	MW-16 7/1/2019	MW-16 11/25/2019
Analytical Method	Analyte	Unit	Calculated		ASD												1
Appendix III - Detection Monitoring			Background Limit ¹	GWPS ²	Background Limit ³											•	
6010B	Boron	mg/l	0.272			0.2 U	0.2 U	NS	0.2 U	0.2 U	0.2 U	NS	0.2 U	0.2 U	NS	0.217	0.2 U
6010B	Calcium	mg/l	252.1			115	200	NS	114	130	78.3	NS	88	71.4	NS	246	224
9056MOD	Chloride	mg/l	24.82			21.3	21.5	NS	10.5	12.9	16.4	NS	17.4	13.9	NS	2.54	4.01
9056MOD	Fluoride	mg/l	0.486			0.405	0.208	NS	0.231	0.265	0.462	NS	0.282	0.486	NS	0.155	0.136
9040C	рН	su	6.56 - 8.29			7.08 J	6.7 J	NS	7.21 J	7.11 J	7.45 J	NS	7.71 J	7.45 J	NS	6.76 J	6.76 J
In Situ	рН	su	6.34 - 8.60			7.01	6.7	6.804	6.93	6.94	6.9	6.878	7.55	7.34	6.863	6.58	6.8
9056MOD	Sulfate	mg/l	198.7			165	221	NS	82	121	194	NS	164	162	NS	172	123
2540 C-2011	Total Dissolved Solids	mg/l	959.2			580	839	NS	490	533	505	NS	496	452	NS	942	784
Appendix IV - Assessme	ent Monitoring							-		-	-	-		-	-		-
6010B/6020	Antimony	mg/l				0.002 U	NS	NS	0.002 U	0.002 U	NS	NS	0.002 U	0.002 U	NS	0.002 U	0.002 U
6020	Arsenic	mg/l	0.035	0.035	0.035	0.0201	0.002 U	0.002 U	0.002 U	0.002 U	0.00482	0.00509	0.00324	0.0104	0.035	0.0341	0.0342
6010B	Barium	mg/l	0.274	2		0.251	0.0765	NS	0.074	0.0864	0.107	NS	0.097	0.103	NS	0.259	0.257
6010B	Beryllium	mg/l				NS	NS	NS	0.002 U	NS	NS	NS	0.002 U	NS	NS	0.002 U	NS
6010B	Cadmium	mg/l				NS	NS	NS	0.002 U	NS	NS	NS	0.002 U	NS	NS	0.002 U	NS
6010B	Chromium	mg/l				NS	NS	NS	0.01 U	NS	NS	NS	0.01 U	NS	NS	0.01 U	NS
6010B	Cobalt	mg/l				NS	NS	NS	0.01 U	NS	NS	NS	0.01 U	NS	NS	0.01 U	NS
9056MOD	Fluoride	mg/l	0.486	4		0.405	0.208	NS	0.231	0.265	0.462	NS	0.282	0.486	NS	0.155	0.136
6010B/6020	Lead	mg/l				NS	NS	NS	0.002 U	NS	NS	NS	0.002 U	NS	NS	0.002 U	NS
6010B	Lithium	mg/l	0.0708	0.0708		0.0358	0.0297	NS	0.015 U	0.0154	0.0428	NS	0.0295	0.0414	NS	0.0635	0.0646
7470A	Mercury	mg/l				NS	NS	NS	0.0002 U	NS	NS	NS	0.0002 U	NS	NS	0.0002 U	NS
6010B	Molybdenum	mg/l	0.005	0.100		0.005 U	0.005 U	NS	0.005 U	0.005 U	0.005 U	NS	0.005 U	0.005 U	NS	0.005 U	0.005 U
6010B/6020	Selenium	mg/l	0.0562	0.0562		0.01 U	NS	NS	0.002 U	0.01 U	NS	NS	0.002 U	0.01 U	NS	0.002 U	0.01 U
6010B/6020	Thallium	mg/l				NS	NS	NS	0.002 U	NS	NS	NS	0.002 U	NS	NS	0.002 U	NS
Calculated 904/903.1	Radium 226/228 Combined	pCi/L	3.2	5		0.546	0.138 J	NS	0.69 J	0.107	1.35 J	NS	0.219 J	0.398	NS	1.69 J	0.995

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

1 = Calculated background limit as calculated as part of the January 7, 2019 assessment of the November 2019 assessment monitoring event.

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

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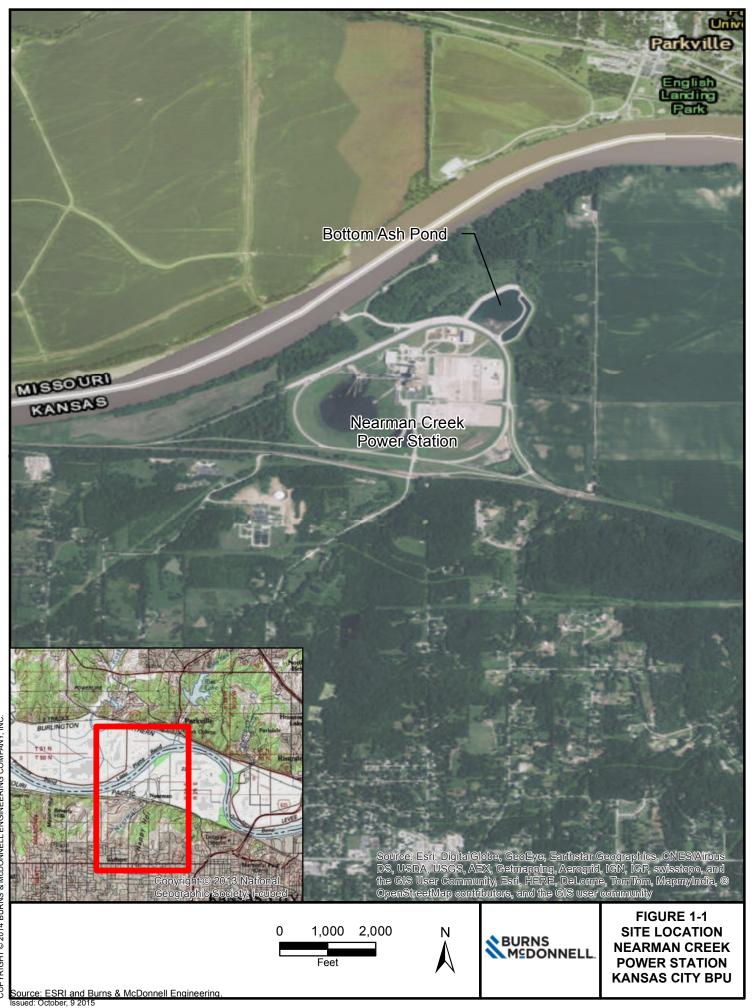
pCi/L = picocurie per liter

su = Standard Units

U = Non Detect at the identified concentration

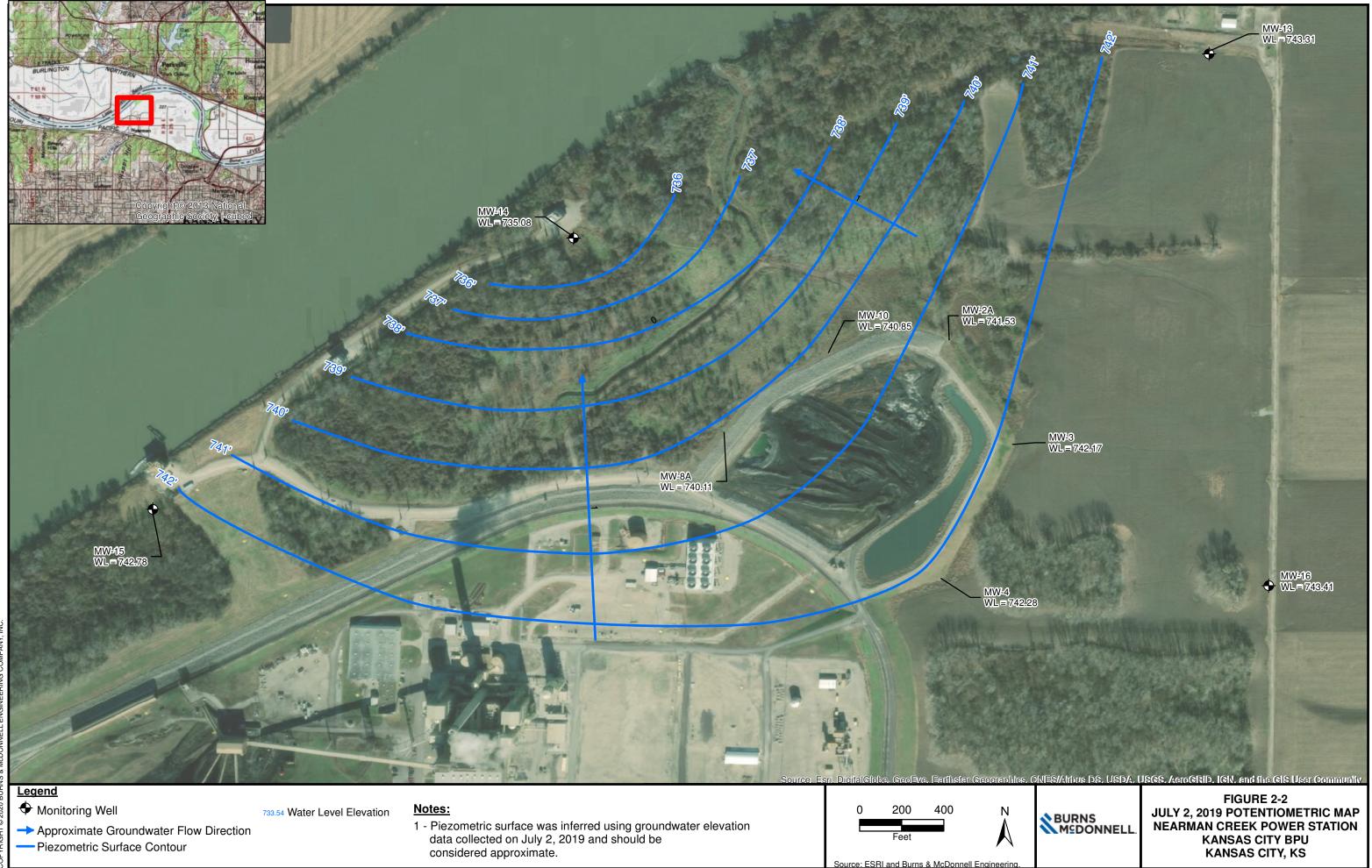
U* = Qualified as non detect during data validation process

FIGURES

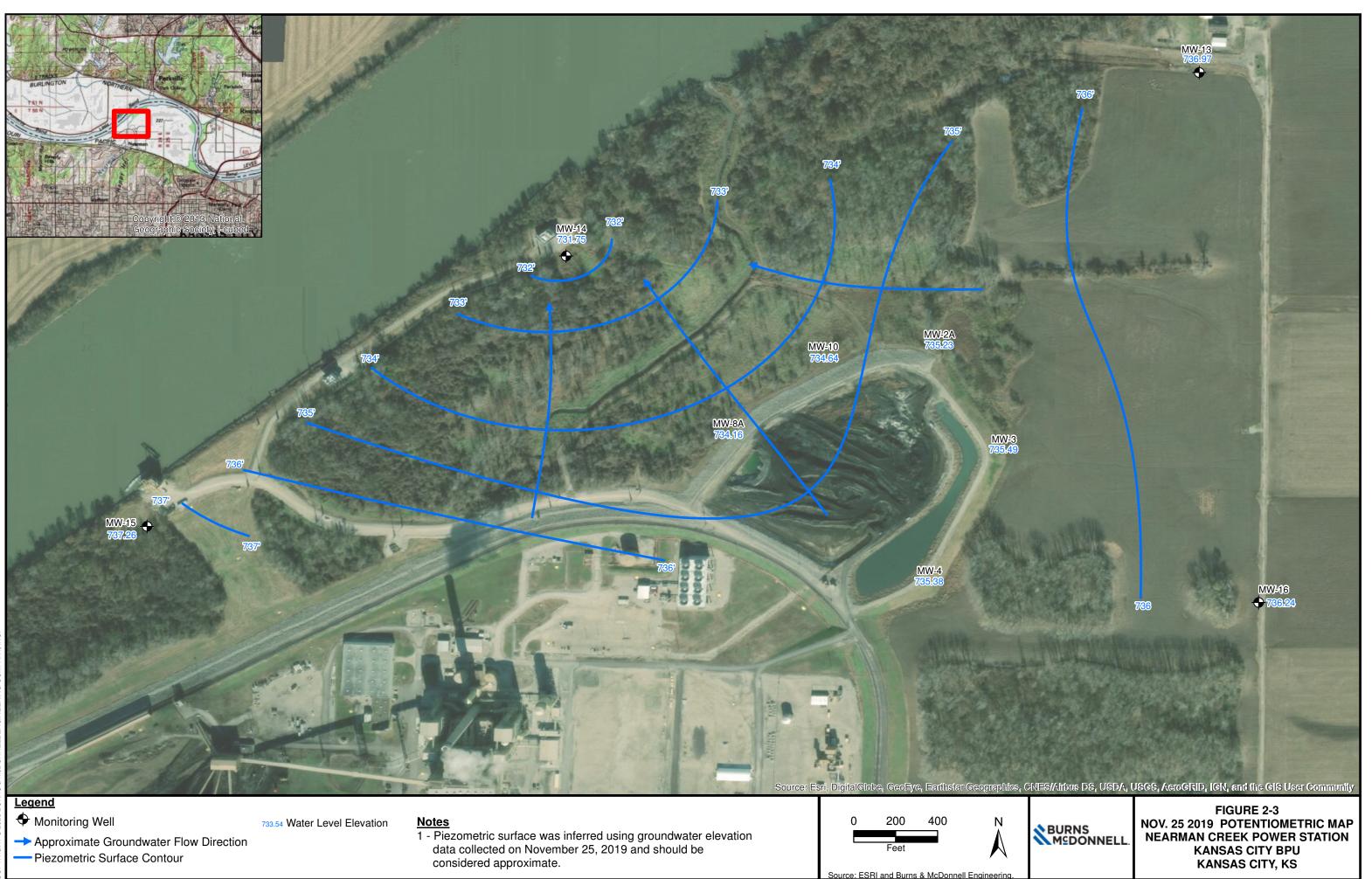




Source: ESRI and Burns & McDonnell Engineering



sued: January, 20 2020



sued: January, 20 2020

APPENDIX A – NOTIFICATIONS RELATED TO GROUNDWATER



April 29, 2019

Mr. Wally (Walter) Mack Hydrogeologic Unit Chief Kansas Department of Health and Environment - Bureau of Waste Management 1000 SW Jackson, Suite 320 Topeka, KS 66612-1366

Re: Updated Groundwater Monitoring System Certification for the Kansas City Board of Public Utilities - Nearman Creek Power Station Bottom Ash Pond

Dear Mr. Selm:

On behalf of the Kanas City Board of Public Utilities (BPU), Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) is hereby submitting an updated certification to the groundwater monitoring system at Nearman Creek Power Station's Bottom Ash Pond. Four additional monitoring wells (MW-13, MW-14, MW-15, and MW-16) were installed by Burns & McDonnell in 2018 on behalf of BPU. Details regarding the additional monitoring well installations are provided in the *Alternate Source Demonstration for the Nearman Creek Power Station Bottom Ash Pond* prepared by Burns & McDonnell (dated December 12, 2018).

This letter supersedes the original *Groundwater Monitoring System Certification* prepared by Burns & McDonnell (dated June 15, 2016) and has been prepared to support compliance with the United States Environmental Protection Agency's (EPA's) *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule* (Final Rule, 40 CFR Parts 257 and 261). The Nearman Creek Power Station Bottom Ash Pond meets the definition of a Surface Impoundment as presented in the Final Rule and is therefore subject to groundwater monitoring requirements identified in 40 CFR §257.91.

The pre-existing groundwater monitoring system and the additional 2018 monitoring well installations are screened and in hydraulic connection within the uppermost alluvial aquifer. Monitoring wells MW-13, MW-14, MW-15, and MW-16 have been added to the pre-existing groundwater monitoring system and will continue to be monitored in accordance with the groundwater monitoring requirements set forth in 40 CFR §257.93 through §257.95. The updated groundwater monitoring system is summarized in the enclosed table and figure. Monitoring well construction diagrams of MW-13, MW-14, MW-15, and MW-16 are provided in Attachment 1.

As set forth herein, and in accordance with 40 CFR §257.91(f), Burns & McDonnell certifies that the groundwater monitoring system for the Nearman Creek Power Station Bottom Ash Pond has been designed and constructed to meet the requirements of section 40 CFR §257.91.

Limitations

This letter has been prepared in accordance with generally accepted environmental engineering practices for groundwater quality assessment and reporting. Conclusions contained herein are Burns & McDonnell's interpretation of readily available data and constitute a professional opinion based on said data. No other warranty, expressed or implied, is made as to the information included in this document. If others make conclusions and recommendations based on data contained herein, such conclusions and recommendations are the responsibility of others.



Mr. Wally (Walter) Mack Kansas Department of Health and Environment - Bureau of Waste Management April 29, 2019 Page 2

Burns & McDonnell has exercised reasonable skill, care, and diligence in preparation of this letter in accordance with customarily accepted standards of good professional practice in effect at the time this report was prepared.

Special risks are inherently associated with the characterization and description of groundwater, including, but not limited to groundwater occurrence, site geology, and site hydrogeology. Even a comprehensive groundwater assessment and/or monitoring program using appropriate equipment, implemented by experienced personnel under the direction of trained professionals, may fail to detect certain conditions.

Changes in subsurface conditions can be influenced by many factors. These factors include but are not limited to management of surrounding areas, seasonal rainfall fluctuations, changes in drainage conditions in and around the site, and groundwater occurrence. Over time, actual conditions discovered are subject to variation because of natural occurrences and/or man-made intervention on or near the site.

If you have questions regarding the information presented herein please contact me at 816-822-3069 or Mr. Brian R. Hoye, PG at 816-823-6257.

Sincerely,



04/29/19 9:45 AM

Mr. Scott A. Martin, PE Professional Engineer

BRH/sam

. ILtog

Mr. Brian R. Hoye, PG Project Manager

Attachments cc: Ingrid Setzler (BPU), Keith Brown (BPU) Mike Selm (Kansas Department of Health & Environment)

TABLE

Existing Groundwater Monitoring Well Network

Nearman Creek Power Station Kansas City, Kansas

					Тор	Ground						
Montirong	Date	Up or Down			of Casing	Surface	<u> </u>	Nell Screen		Construc	ted Well To	otal Depth
Well	of	Graident of	Northing	Easting	Elevaiton	Elevation	Thickness	Тор	Bottom			
ID	Installation	Bottom Ash Pond			(ft amsl)	(ft amsl)	(feet)	(ft amsl)	(ft amsl)	(feet amsl)	(ft bgs)	(ft bTOC)
Groundwater I	Monitoring Wells											
MW-2A	October 2015	Down (Cross)	323923.39	2937911.60	747.86	744.99	5.00	721.18	715.70	716.18	28.81	31.68
MW-3	September 1982	Up	323434.49	2938160.38	750.48	748.48	20.00	728.48	715.78	715.78	32.70	34.70
MW-4	January 1983	Up	322800.43	2937915.96	746.99	745.69	20.00	725.69	715.24	715.24	30.45	31.75
MW-8A	October 2015	Down	323462.96	2937093.00	750.12	747.59	5.00	719.95	714.47	714.95	32.64	35.17
MW-10	October 2015	Down	323844.68	2937474.63	745.30	742.69	5.00	720.80	715.32	715.80	26.89	29.50
MW-13	September 2018	Up (Cross)	325317.62	2938817.53	747.81	745.06	5.00	719.33	713.85	714.33	30.73	33.48
MW-14	September 2018	Down	324361.67	2936503.71	749.18	746.08	5.00	720.91	715.43	715.91	30.17	33.27
MW-15	September 2018	Up (Cross)	323020.60	2935004.36	752.88	750.20	5.00	725.18	719.70	720.18	30.02	32.70
MW-16	November 2018	Up	322808.22	2939131.62	748.43	745.67	5.00	720.92	715.44	715.92	29.75	32.51

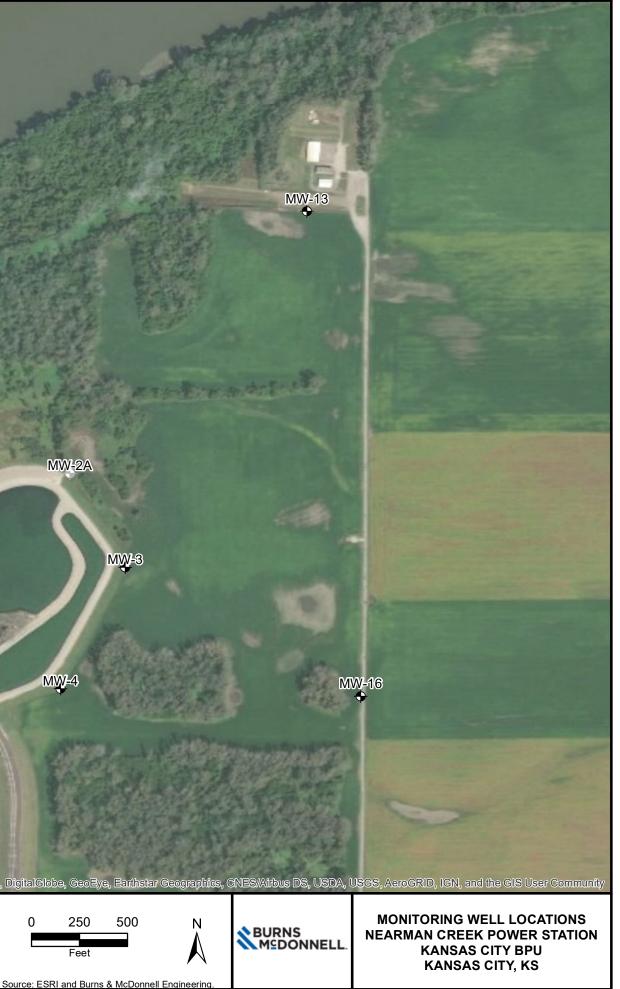
Notes:

amsl - above mean sea level bgs - below ground surface bTOC - below top of casing ft - feet

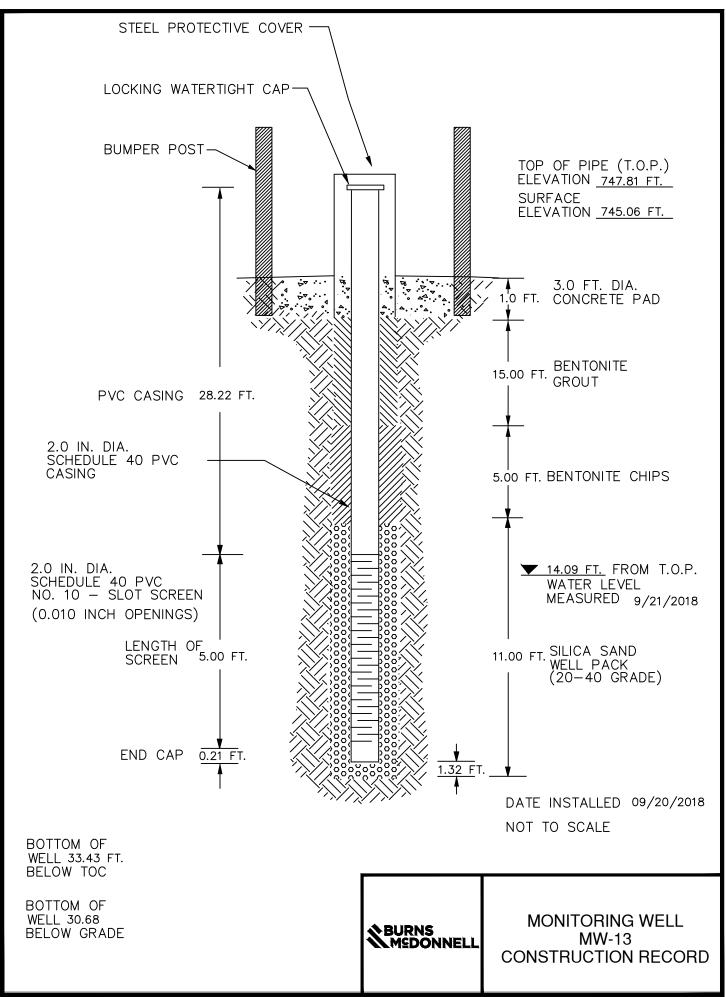
1. Survey data provided by Atlas Surveyors on *Survey of Monitoring Wells* dated Dec. 4, 2018.

FIGURE

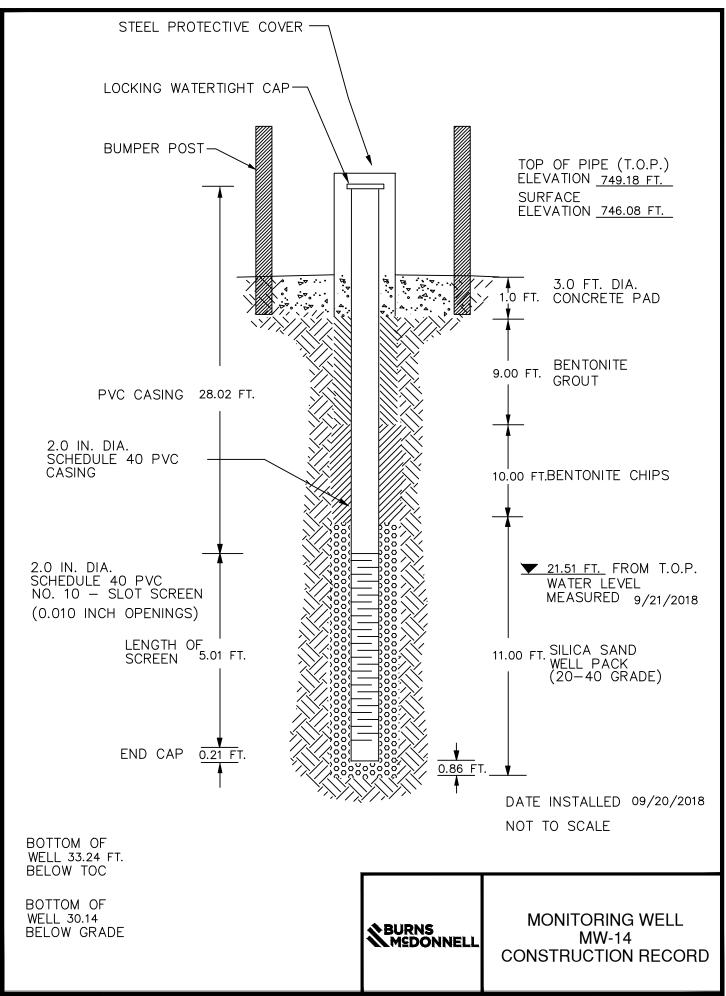


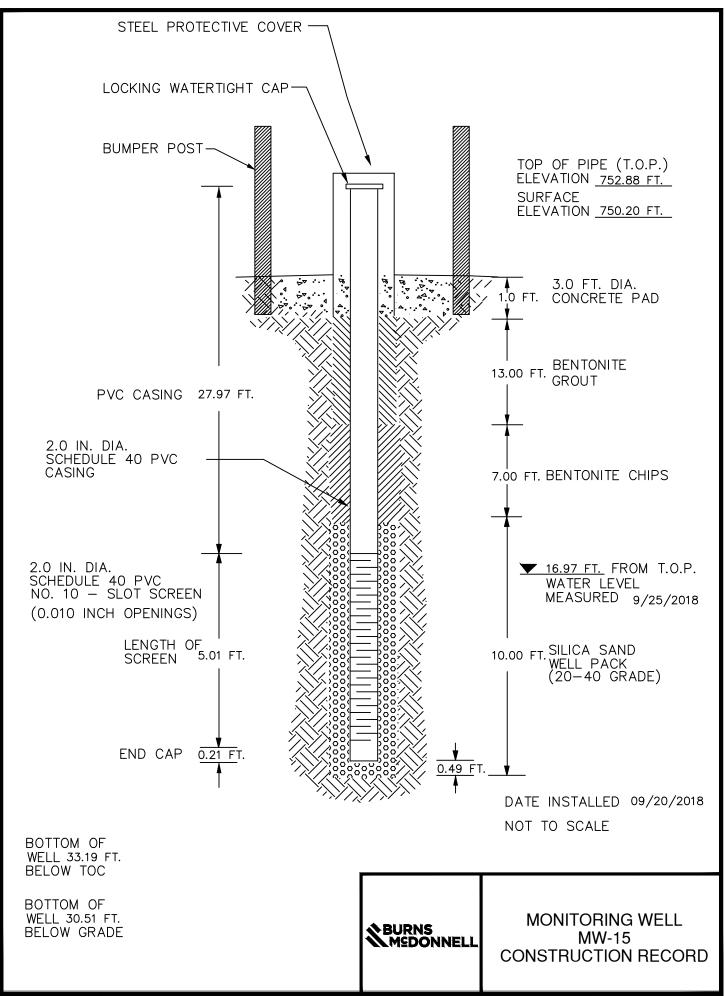


ATTACHMENT 1 – MONITORING WELL DIAGRAMS

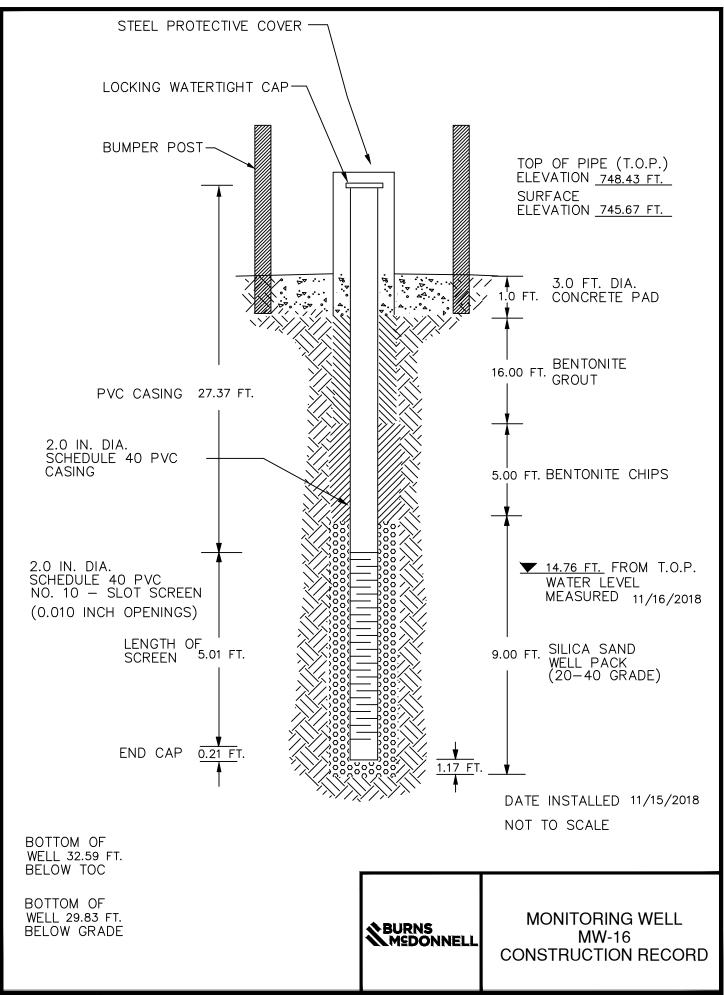


Z:\CLIENTS\ENS\KCBPU\88777_CCRGWMON\STUDIES\MODELING\MW CAD FILES\MW 13 CONSTRUCTION DIAGRAM.DWG





Z:\CLIENTS\ENS\KCBPU\88777_CCRGWMON\STUDIES\MODELING\MW CAD FILES\MW 15 CONSTRUCTION DIAGRAM.DWG



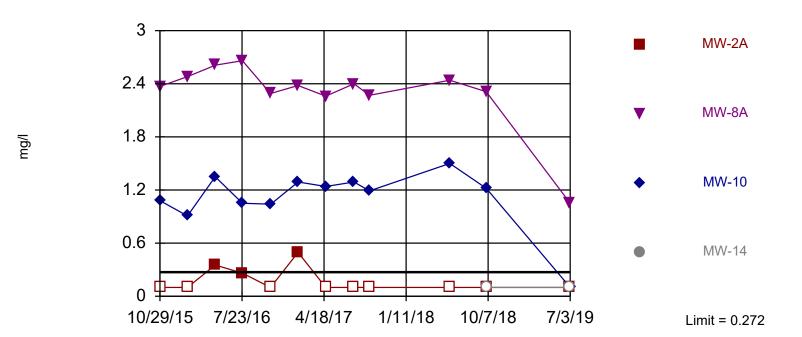
Z:\CLIENTS\ENS\KCBPU\88777_CCRGWMON\STUDIES\MODELING\MW CAD FILES\MW 16 CONSTRUCTION DIAGRAM.DWG

APPENDIX B – STATISTICAL EVALUATION

Sanitas[™] v.9.6.20 For the statistical analyses of groundwater by Burns & McDonnell only. EPA Hollow symbols indicate censored values.

Exceeds Limit: MW-8A

Prediction Limit



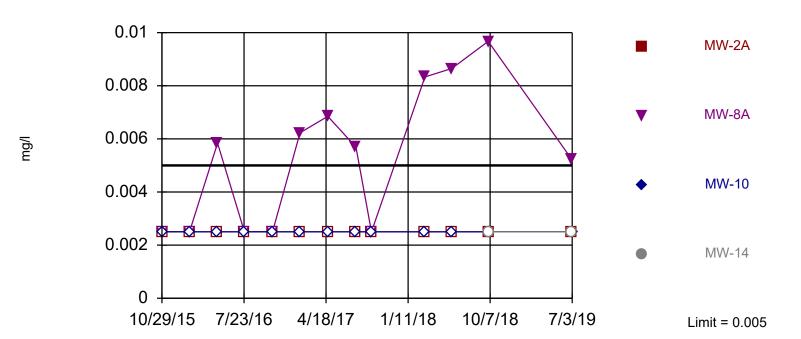
Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 29 background values. 65.52% NDs. Report alpha = 0.1212. Individual comparison alpha = 0.03179. Most recent point for each compliance well compared to limit. Distribution was found to be non-normal after removal of suspect values, so outliers could not be identified. Seasonality was not detected with 95% confidence.

Constituent: Boron Analysis Run 8/26/2019 10:05 AM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Sanitas[™] v.9.6.20 For the statistical analyses of groundwater by Burns & McDonnell only. EPA Hollow symbols indicate censored values.

Exceeds Limit: MW-8A

Prediction Limit



Interwell Non-parametric

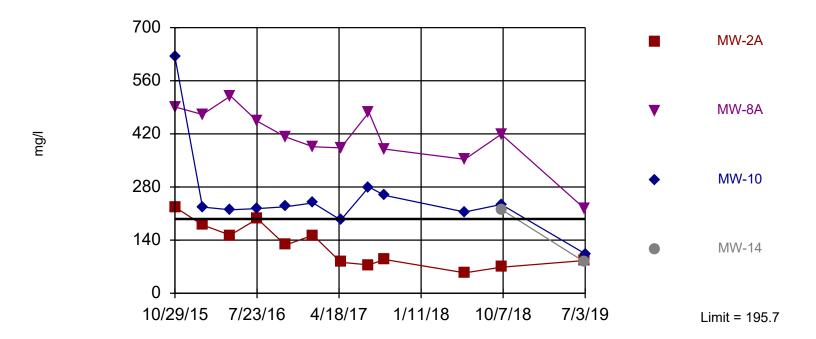
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 31) were censored; limit is most recent reporting limit. Report alpha = 0.1143. Individual comparison alpha = 0.02988. Most recent point for each compliance well compared to limit. Distribution was found to be non-normal after removal of suspect values, so outliers could not be identified. Seasonality was not detected with 95% confidence.

Constituent: Molybdenum Analysis Run 8/26/2019 10:06 AM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR

Sanitas[™] v.9.6.20 For the statistical analyses of groundwater by Burns & McDonnell only. EPA

Exceeds Limit: MW-8A

Prediction Limit



Background Data Summary: Mean=122.7, Std. Dev.=30.3, n=29. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9803, critical = 0.926. Report alpha = 0.05. Individual comparison alpha = 0.0125. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. No background outliers were found.

Constituent: Sulfate Analysis Run 8/26/2019 10:06 AM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR

Prediction Limit

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 8/26/2019, 10:09 AM

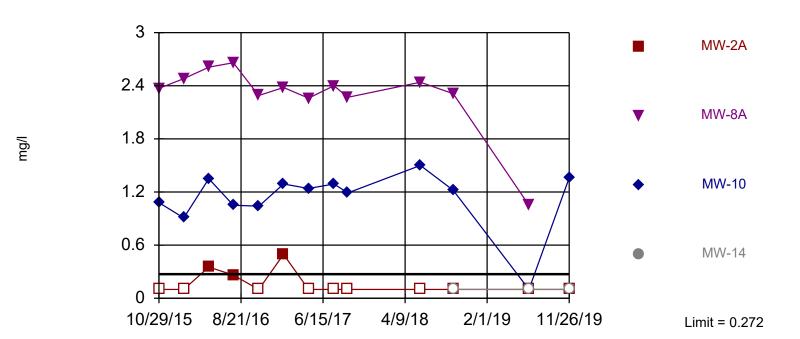
<u>Constituent</u>	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method
Boron (mg/l)	MW-8A	0.272	n/a	7/1/2019	1.06	Yes	29	65.52	n/a	0.03179	NP Inter (NDs)
Molybdenum (mg/l)	MW-8A	0.005	n/a	7/1/2019	0.00524	Yes	31	100	n/a	0.02988	NP Inter (NDs)
Sulfate (mg/l)	MW-8A	195.7	n/a	7/1/2019	223	Yes	29	0	No	0.0125	Param Inter

Sanitas[™] v.9.6.23 For the statistical analyses of groundwater by Burns & McDonnell only. EPA Hollow symbols indicate censored values.

Exceeds Limit: MW-8A, MW-10

Prediction Limit

Interwell Non-parametric

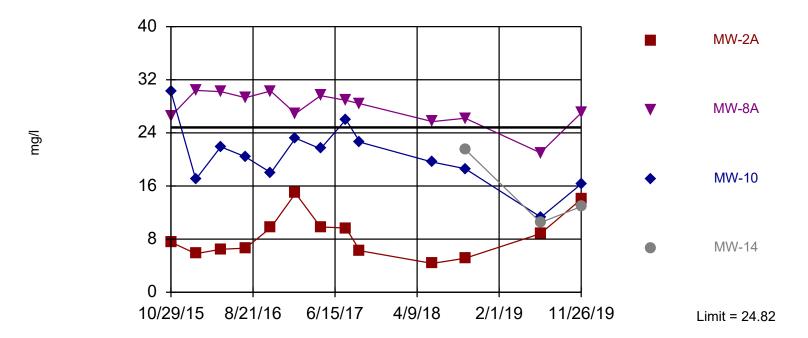


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 34 background values. 70.59% NDs. Report alpha = 0.1053. Individual comparison alpha = 0.02742. Most recent point for each compliance well compared to limit. Distribution was found to be non-normal after removal of suspect values, so outliers could not be identified. Seasonality was not detected with 95% confidence.

Constituent: Boron Analysis Run 1/7/2020 2:55 PM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Sanitas™ v.9.6.23 For the statistical analyses of groundwater by Burns & McDonnell only. EPA

Exceeds Limit: MW-8A

Prediction Limit

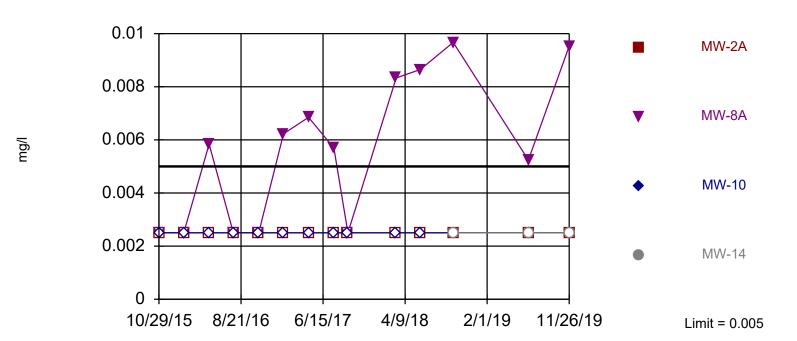


Background Data Summary (based on cube root transformation): Mean=1.971, Std. Dev.=0.3971, n=34. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.946, critical = 0.933. Report alpha = 0.05. Individual comparison alpha = 0.0125. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. No background outliers were found.

Constituent: CHLORIDE Analysis Run 1/7/2020 2:55 PM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Sanitas[™] v.9.6.23 For the statistical analyses of groundwater by Burns & McDonnell only. EPA Hollow symbols indicate censored values.

Exceeds Limit: MW-8A

Prediction Limit

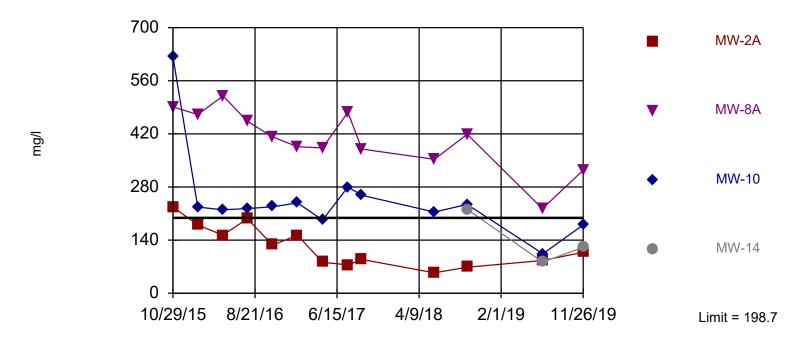


Interwell Non-parametric

Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 36) were censored; limit is most recent reporting limit. Report alpha = 0.1. Individual comparison alpha = 0.026. Most recent point for each compliance well compared to limit. Distribution was found to be non-normal after removal of suspect values, so outliers could not be identified. Seasonality was not detected with 95% confidence.

Constituent: Molybdenum Analysis Run 1/7/2020 2:55 PM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Exceeds Limit: MW-8A

Prediction Limit



Background Data Summary: Mean=122.4, Std. Dev.=32.04, n=34. Seasonality was not detected with 95% confidence. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9796, critical = 0.933. Report alpha = 0.05. Individual comparison alpha = 0.0125. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. No background outliers were found.

Constituent: Sulfate Analysis Run 1/7/2020 2:55 PM View: AUG 2019 BKG Update BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR

Interwell Pred Limits

BPU Client: Burns & McDonnell Data: BPU_Groundwater_CCR Printed 1/7/2020, 2:57 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	Transform	<u>Alpha</u>	Method
Boron (mg/l)	MW-8A	0.272	n/a	7/1/2019	1.06	Yes	34	70.59	n/a	0.02742	NP Inter (NDs)
Boron (mg/l)	MW-10	0.272	n/a	11/26/2019	1.36	Yes	34	70.59	n/a	0.02742	NP Inter (NDs)
CHLORIDE (mg/I)	MW-8A	24.82	n/a	11/26/2019	27	Yes	34	0	x^(1/3)	0.0125	Param Inter
Molybdenum (mg/l)	MW-8A	0.005	n/a	11/26/2019	0.00953	Yes	36	100	n/a	0.026	NP Inter (NDs)
Sulfate (mg/l)	MW-8A	198.7	n/a	11/26/2019	324	Yes	34	0	No	0.0125	Param Inter

APPENDIX C – MONITORING WELL DEVELOPMENT FIELD DOCUMENTATION

			I	Well Dev	velopm	ent Form				Page <u>)</u> of <u>1</u>	
Project Name:	Nearman	Well De	velopment	Project N	umber:]	15924	SW File N	lumber:		Well Name: MW-2A	
Project Inform	iation					Elevation o	f Piezom	eter			
Facility Name:	Nearman	Power Pla	.nt			Ground Sur	face Eleva	tion (GS):		745.37	
Location: Kans	as CIMIES	N 3239	23.74	E 2250	166.32	Top of Casi	ing Elevati	on (TOC):		747.86	
Location in Dec	cimal Degrees:	LatDD:		LongDD:		Measuring I	Point Eleva	ation (MP):		147.86	
Well Informatio	n					Well Volum	re Calcula	tion			
Date Drilled:	10-19-15	to 10-20-	15								
Borehole Dept	<u>n: 7</u> 0			feet from	65	31.05	- 10.9	le = 2	Dileg-		
Casing Depth:		31.69		feet from	TOL	<u> </u>					
Depth to ⊺op o	f Screen:	3664		feet from	TOL	201.01	1. 010	1/2)	2-3.3	381	
Depth to Bottor	m of Screen:	26-6-1-31-1	64	feet from	TOL	a source of the	0.040			ري د را ال	
Filter Top Dept	<u>h:</u>	BLGH NI	Δ.	feet from							
Filter Bottom D	epth:	NIĂ		feet from							
Length of Casi		NA 5.0		feet		1 well volu	me (gallons)	≃ intial heigh	t of water column	n (ft) x 0.0408 x (casing diameter (in)) ^z	
Type of Forma	tion Screened:	outhou	al same			ini	tial height of	water columr	(ft) = total depth	ו (ft) - intial depth to water (ft)	
Development	Method										
Equipment:				Drilling Me	ethods:						
Surge	<u></u>	Bail									
Airlift		Pump	<u> </u>								
Observations	During Develo	pment		den et							2
		Depth to	Total	Fluid Re	emoved	Temp.	рН	S.C.	Tubidity	Fluid Appearance and Remark	s
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	(color, odor, etc.)	
4/24/19	110:27	1896	31.65	Ø	Ø	18.2.	7.2	•869	244	Cloudy	_
<u>Ч/24/р</u>	16:29	11.20	31.65	3.5	3.5	18.2%	7.2	0.874	43.2	Clear	
4/24/19	16:32	11-30	31.65	3.5	7.0	18.0°C	7.2	0.877	10.0	Clear	
4/24/19	110:35	11-3	31-65	3.5	\$10.5	17.800	7.3	0.868	289	Cloudey_	
4/24/19	16:38	11.31	31.05	3.5	[4.D	17.3 * C	7.2	0.867	57.2	Sugaran acoudy	
4/24/19	16:41	11.31	31.65	3.5	17.5	16.8	7.4	0.869	148	Slightly ceoudy	
4/24/19	16:43	11.31	31.65	3.5	21.0	17.100	7.1	0.867	39.6	Signitin cloudy to	_uer
4124/19	16:45	11-31	31.65	3.5	24.5	17.100	7.2	0-875	182	Signiting cloudy	
4/24/19	16:47	1(-5)	31.65	3.5	28.0	18.3	7.2	0.883	95.1	Slightly cloudy	
4/24/19	16:49	14.31	31.65	3.5	31.5	17.7"	7.2	0.881	38.4	clear	
4/24/19	16:52	11.31	31.65	3.5	35.0	17-800	7.3	0.884	13.7	dear	
Alou toc culss autervis	e noted in Remarks										<u>_</u> !

- 31 -

			1	aaeli nea	elopm	ent Form					Page <u>\</u> of <u>\</u>
Project Name:	Nearman	Well De	velopment	Project N	umber: (15924	SW File N	lumber:		Well Name:	MW-3
Project Inform	ation					Elevation of	f Piezome	eter			
Facility Name:	Nearman	Power	Plant			Ground Sur	face Eleva	ation (GS):	748	82	
Location: KAN	MAS CITY, KS	N 32344	3.122	E 225 04	07.905	Top of Casi	ng Elevati	on (TOC):	750	.44	
Location in Dec	cimal Degrées:	LatDD:		LongDD:		Measuring I	Point Eleva	ation (MP):	750	2,44	
Well Informatio	n					Well Volum	ie Calcula	tion			
Date Drilled:					·						
Borehole Depth	h:			feet from		33.97-	1332:	- 20,65			
Casing Depth:	Wa	5.82		feet from	TOC	Li de la constante					
Depth to Top or	f Screen: (5.82		feet from	TOC	20.65	0.0409	3)(4)=	= 13.48	G	
Depth to Bottor	m of Screen: 7	35.82		feet from	TOL						
Filter Top Dept	1			feet from							
Filter Bottom D	epth: 🎝	<u>A ا د</u>		feet from							
Length of Casir	ng Screened:	150		feet		1 well volur	ne (galions)	= intial height	of water column	n (ft) x 0.0408 x (casing diameter (in)) ²
Type of Format	tion Screened:	Allevicio	<u> </u>			ini	tial height of	water column	(ft) = total depth	ı (ft) - intial depth	to water (ft)
Development	Method								i se		
Equipment:				Drilling Me	thods:						
Surge		Bail									
Airlift		Pump	\times								
Observations	During Develop										
		Depth to	⊤otal	Fluid Re	moved	Temp.	рH	S.C.	Tubidity		arance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)		or, odor, etc.)
4/25/19	14:18	13.32	33.97	B	à	19.5*	7.7	0-801	926	1	in to Croudy
4/25/19	14: 25	15.55	33.97	15	15	16.900	7.6	0.921	351	Cloud	
4 /25/19	14:32	14.60	33.97	15	30	110.6°C	7.2	1.002	76.5	dear	
4/25/19	[4:4]	15.30	34.0	15	45	16.60	7.3	1.032	140	Clo	udg
4/25/19	14:410	15.30	34.0	15	60	/7.3.	7.3	1.069	47.6	Clea	
4/25/19	14:53	15.30	34.0	/5	75	17.3°C	7.4	1.089	38.5	Lee Cee	ar
4/25/19	15:02	15.30	34.0	15	90	17.300	7.4	1.099	13.4	<u> </u>	ear
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Well Development Form

Page \ of \

			١	Nell Dev	elopm	ent Form					Page of
Project Name	: Nearman	Nell Deve	connent	Project N	umber:)	15924	SW File I	Number:		Well Name:	MW-4
Project Inform	a second a la seconda de la					Elevation o	f Piezom	eter			
Facility Name:	Nearman P	ower pla	unt			Ground Sur	face Eleva	ation (GS):	-295	7745 -	57-
Location: KAN	sas City, KS	N 522901	. 957	E 27 2017	10.153	Top of Casin	ng Elevati	on (TOC):	746 9	0	
Location in De	cimal Degrees:	LatDD:		LongDD:		Measuring F	Point Elev	ation (MP):	746.9	0	
Well Informatio	n - Est					Well Volum	ie Calcula	ition			
Date Drilled:											
Borehole Dept	h:			feet from		31.91-	9.82	= 22.0	۹		
Casing Depth:	36	2.24		feet from	76C						
Depth to Top o	f Screen: 12	-24		feet from	706	22 09/1	19408V	1012 - 14	4.42 6		
Depth to Botto	m of Screen: 3	224		feet from -	TOC	adico (()	•••••	ν η τ	1 01		
Filter Top Dept	th: \mathcal{N}	[A		feet from							
Filter Bottom D		14		feet from							
Length of Casi		10.0		feet	· . —	1 well volur	ne (gallons)	= intial height	of water column	ו (ft) x 0.0408 x (casing diameter (in)) ²
Type of Forma	tion Screened:	elluvial sa	, sul			int	ial height of	water column	(ft) = total depth	n (ft) - intial depth	ı to water (ft)
Development	Method						<u> </u>				
Equipment:	r			Drilling Me	ethods:						
Surge		Bail									·
Airlift		Pump									
					te Blanda kao ka Jac ka Ja					1.11 M. M. M. M. M. L.	
Observations	During Develop							алан (1997) Т		1 1	
		Depth to	Total	Fluid Re		Temp.	pН	S.C.	Tubidity		arance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	⊤otal	(degrees F)	(units)	(mS/cm)	(NTU)		or, odor, etc.)
4/20/19	9:40	9.82	31.90	Ø	Ø	15.3 %	\$.2	0.492	112	5/17	htty cloudy
4/26/19	9:42	10.68	31.90	15	15	14.1"	7.9	0.543	76.4	<u>Clea</u>	
4/21/19	9:44	10.68	31.90	15	30	14-100	7.7	0.594	50.1	<u> </u>	
4/20/19	9:47	10.68	<u>31.9 D</u>	15	45	14.3"	7.5	0.600	<u>- 71.7</u>	de.	
4/24/19	9:49	10.68	31,90	15	(et	14.0.	7.5	0.683	26.9		ar
4/26/19	9:52	10.68	31.90	15	75	14.000	7.5	0.7/2	34.4	_	ear
4/26/19	9:55	10.68	31 90	15	90	14.200	7.4	0.695	14.4	$\mid $ $(u$	ak
			*hard bolt	om							<u></u>
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Trom TOC unlas otherwis	se noted in Remarks	1			1						·····

- Start Start

J.

			I	Nell Dev	elopm	ent Form					Page λ of λ
Project Name:	Nearman we	11 Develop	ment	Project N	umber: <u>}</u> }	5984	SW File N	lumber:		Well Name:	MW-8A
Project Inform	البريد البريد المتحالية المتحالية المتحدية المحدودات					Elevation o	f Piezom	eter			
Facility Name: #	Voarman Pon	re Plant				Ground Sur	face Eleva	tion (GS):	747	.99	
Location: Kruns	as afri KS	N 323462	(.51	E 2249	342.67	Top of Casi	ng Elevati	on (TOC):	750		
Location in Dec	imal Degrees:	LatDD:		LongDD:		Measuring F	Point Eleva	ation (MP):	750	.10	
Well Information	1			es e se		Well Volum	e Calcula	tion 🖉			
Date Drilled:	10-19-15										
Borehole Depth				feet from	6 99	20000)	6 6 3	21,49			
Casing Depth:	35.	38		feet from	TOC	35.06-) 20.49(0-1	4.51-	Of 4 . 1 .			
Depth to Top of	Screen: 30	38		feet from	TOC	Jay Gla	N/RG LO	2) * =	2 34 (2		
Depth to Botton	n of Screen: 35	5.38		feet from	TOC	20.11(01	040010	~)	J. J. C(
Filter Top Depth	1: N(.	A		feet from							
Filter Bottom De	ې 🔨 (Apth:	7		feet from							
Length of Casin	ig Screened: i 🖆	5,0		feet		1 well volur	ne (gallons)	= intial height	of water column	n (ft) x 0.0408 x («	casing diameter (in)) ²
Type of Format	ion Screened:	allowid	1 sand			int	ial height of	water column	(ft) = total depth	ı (ft) - intial depth	to water (ft)
Development I	Viethod				de local						
Equipment:				Drilling Me	thods:						
Surge		Bail									
Airlift		Pump	×								
							184, 100, 11, 14, 14, 14, 1				The second s
Observations	During Developn	······································									
_		Depth to	Total	Fluid Re		Temp.	pН	S.C.	Tubidity		rance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)		er, odor, etc.)
4/24/19	14:17	14.57	35.06	Ø	Ø	17.5%	7.0	0.571	over	aarek	beown
4/24/19	14:20	19.24	35.04	4	<u> </u>	16.9"	7.3	0.745	Over.	Very Clou	ldy
4/24/19	<u> 4'24</u>	18.39	35.20	Ц	<u>ð</u>	16.8°	7.3	D.801	128	slight	ly cloudy
4/24/19	14:34	18.32	<u> </u>	4	12	18.3	7.3	0.848	over	beon	
4/24/19	<u>14:38</u>	18.30	35.20		16	17.02	7.4	0.874	<u> </u>	<u> </u>	
4 124 /19	<u> </u>	18,30	35.20	4	20	4-	7.4	0.867	own		lordy
4/24/19	14:47	18.30	35.20	<u> </u>	<u>व</u> ि4 २ २	16.6	7,4	0.887	64.5	Slight CLOURD	1
4/24/19	14:52	18.50	35,20	4	28	16.9	7.4	0.831	<u> 498 </u>	cenude	8
4/24/19	14:56	18.30	35.20	4	32	17.0°0	-4.4	0.887	58. Ť		lare
4124/19	14:59	1830	35.20	4	34	16.80	7.4	0.913	35.4	+ ⁻	ar
4/24/19	15:02	[8, 30	35.20	4	40	16.900	7,4	0.913	23.A		ea R
								ļ		├	
TOC unites otherwise	e noted in Remarks		··· · · · · · · · · · · · · · · · · ·	<u></u>	. <u> </u>	t	I	<u> </u>		•	

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			1	Madi Dev	elobili	ent Form					Page <u></u> of <u></u>
Project Name:	Nearman	Well Deire	lopment	Project N	umber:		SW File N	lumber:		Well Name:	MW-10
Project Inform	ation					Elevation o	f Piezom	eter			
Facility Name:	Nearman	POWER F	Plant-			Ground Sur	face Eleva	ition (GS):	743.	<i>دی</i>	
	isas city, KS			E 22497	38,550	Top of Casi	ng Elevati	on (TOC):	7452		
Location in Dec		LatDD:		LongDD:		Measuring F	Point Eleva	ation (MP):	7452	5	····
Well Informatio	n					Well Volum	e Calcula	tion			
Date Drilled:	10-10	1-15									
Borehole Depth	1: 20.0			feet from	65	29.64.	-9.30	= 20.3	34		
Casing Depth:	31.64	1		feet from	TOC			NU ···	- 1		
Depth to Top of	f Screen: 16.6	Ч		feet from	TOC		A (1) 1 A (1612	= 3.32	1.	
Depth to Bottor	n of Screen: 31.	.64		feet from	TOL	a0.340	0.0408	1(2)	- 2·2d	6	
Filter Top Dept	h: NI	A		feet from							
Filter Bottom D	epth: ハ	<u>д</u>		feet from							
Length of Casir	ng Screened:	15.0		feet		1 well volur	ne (gallons)	= intial height	of water column	т (ft) x 0.0408 x (с	asing diameter (in))²
Type of Format	ion Screened:	alluvia	Band			int	ial height of	water column	(ft) = total depth	ı (ft) - iлtial depth	to water (it)
Development I	Method					Star Service	A CAR	ji ka			
Equipment:				Drilling Me	ethods:						
Surge		Bail									
Airlift		Pump	×								
Observations	During Developr	nent				2 <u>88</u> 2572					
		Depth to	Total	Fluid Re	moved	Temp.	pН	S.C.	Tubidity	Fluid Appea	rance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	(colo	r, odor, etc.)
4/24/19	15:30	9.30	29.64	×1	Ø	16.7%	7.1	1-074	Over	dark bi	rown
4/24/19	15:34	9.30	29.64	3.5	3.5	14.60	<u> </u>	1.417	52.7	Slightly (1	andy to clear
4/24/19	15:40	9.30	29.64	3.5	7.0	16.1%	7-1	1.402	13.9	lear	2 '
4/24/19	15:48	9.30	29.64	3.5	10.5	16.500	7.1	1.104	16.3	clea	. <u>r</u>
4/24/19	/5:5/	9.30	24.64	3.5	14.0	16.3"	٦,١	1.104	13.6	clea	R
4/24/19	15:56	9.30	29.64	3.5	17.5	16.3%	7.2	1110	109	signitiz	choudly
4/24/19	15: 58	9.30	29.64	3.5	21.0	16.2	7.1	1.102	15.5	Clea	ie
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non ioc unics otherwis	c noted in repriarks							<u> </u>		1	

Well Development Form

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Page $\underline{\lambda}$ of $\underline{\lambda}$

				aaeu Dea	elobu	ent Form					Page $\underline{1}$ of \underline{P}
Project Name	: Nearennau	Well	Developmen	Project N	umber: /	15924	SW File I	lumber:		Well Name:	MIN-13
Project Inform	nation					Elevation c	f Piezom	eter		41 - N Z	
Facility Name:	Neeveman #	ower Pla	nt loffsite 4	ell location	1	Ground Sur	face Eleva	ation (GS):	ЭИS.		
Location: Kay	sal Cutor KS	N 32531		E 29388		⊺op of Casi	ng Elevati	on (TOC):	748.	43	
Location in De	cimal Degrees:	LatDD:		LongDD:	·	Measuring I	Point Elev	ation (MP):	Juz.	из	
Well Informatic)n.					Well Volun	e Calcula	tion 🔗			
Date Drilled:	9-20-1	16			_						
Borehole Dept	h: BO			feet from	65	32.40	5 - 9.3	0 = 24	.10		
Casing Depth:		33.48		feet from	700		- 1. C		• •		
Depth to Top o	of Screen:	28.48		feet from	TOC	24 15/0		102	3.93 6		
Depth to Botto	m of Screen:	33.48		feet from	TOL			((~) =	5.75 G		
Filter Top Dept	th: A	OIA		feet from							
Filter Bottom	Depth: /	NIA		feet from							
Length of Casi	ing Screened:	5.0		feet		1 well volut	ne (gallons)	= intial height	of water column	n (ft) x 0.0408 × (c	asing diameter (in))2
Type of Forma	tion Screened:					int [ial height of	water column	(ft) = total dept	n (ft) - intial depth	to water (ft)
Development	Method										
Equipment:				Drilling Me	thods:						
Surge		Bail									
Airlift		Pump	X						•		
			,								· · · · ·
Observations	During Develop	ment									
		Depth to	Total	Fluid Re	moved	Temp.	pН	S.C.	Tubidity	Fluid Appea	rance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	(colo	r, odor, etc.)
4/24/19	11:38	9.30	33.40	ø	Ø	20.0 **	7.4	0.743	OVER	dark	brown
<u>4/84/19</u>	11:41	9,30	33.40	4	4	/6.0°C	7.3	0.850	528	clou	dy
4/24/19	11:45	9.30	33.40	4	8	17.5"	7.2	0-845	41	cioud	<u>m</u>
4/24/19	11:54	9.30	33.40	ц	12	18.0 °	7.3	0.833	318	Clou	diz
4124/19	11:58	9.30	33.40	4	16	17.6°C	7.3	0.838	98.9	Sugntly.	
4/24/19	12:03	9.30	33-40	4	20	18.900	7.4	0.848	464	Cloud	ly
4/24/19	12:07	9-30	33.40	Ч	24	16.7°	7.3	0.850	88.2	Slightly	Cloudy
4/24/19	12:12	9.30	33.40	4	28	14.800	7.4	0.848	over	ceour	-
4/24/19	12:16	9.30	33,40	- 4	32	16.0	7.3	0:845	156	Slightle	
4/24/19	12:19	9.30	33.40	4	36	110.200		0.938	114	Slight	
4/24/19	12:22	9.20	33.40	4	40	16.5	7.3	0.847	9.3.4	Hickory	Cloudy_
4/24/19	12:25	9.30	33.40	4	44	17.0"	7.4	0.640	Le7.9	Slightin	cloudy
				<u> </u>		l					<u> </u>

Well Development Form

Page $\underline{\lambda}$ of $\underline{\lambda}$

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from TOC unles otherwise noted in Remarks

Well Dev	elopment	Form	(Continuation	I)
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Page <u>A</u> of <u>A</u>

Project Nam	e: A reasman	" will Deve	60 ment	Project	Number:	115924			Piezometer Number: MM-13
		Development			1794 - 1995 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -				
		Depth to	Total	Fluid R	emoved	Temp.	pН	S.C.	Fluid Appearance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(µS/cm)	
4/24/19	17:30	9.30	33.40	4	48	17.0°°	7.4	0.829	45.3 NTM / Clear
4124/19	12:34	9.30	33.40	4	รี่ฉ	17.2°	7.3	0.838	41-1 NTM / Clear
4/24/19	12130	9.30	33-40	4	56	17.(00	7.3	0.839	25.9 NTU / CUPAD.
4/24/19	12:39	9.30	33.40	4	تصا	16.7"	7.4	0.83/	59.9 NTU / Uran
4/24/19	12:44	9.30	33.40	4	64	17.100	7.3	0.828	27.3 NTY / CLEAR
4/24/19	12:47	9,30	33.40	4	68	16.7°C	7.3	0.844	21.4 NTU / Cleare
					_				
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							-		· · · · · · · · · · · · · · · · · · ·
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Maxim TOC uples other		<u> </u>							

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091294 Form WC: OP6-2

			I	Well Dev	elopm	ent Form					Page <u>i</u> of <u>)</u>
Project Name:	: Nealeman	Nell Devel	poment	Project N	umber: \	15924	SW File N	lumber:		Well Name:	MW-14
Project Inform	the second state of the se				ê Herê î	Elevation o	f Piezome	eter		2.242.005	
Facility Name:	Nearman Pi	ower Plant	•			Ground Sur	face Eleva	tion (GS):	746.08	>	
Location: Kars		N 324361		E29365	63.71	Top of Casi	ng Elevati	on (TOC):	749.18		
Location in Dec		LatDD:		LongDD:		Measuring F	Point Eleva	ation (MP):	749.18		
Well Informatio	>n					Well Volum	ie Calcula	tión			
Date Drilled:	9-70	- 18									
Borehole Depti	h: <u>30</u>			feet from	65	33.21-	17.00 =	ho.al			
Casing Depth:	37	3,27		feet from	TOC.	الس)(م د		a <u>-</u> a.(ም በ_		
Depth to Top o		8.27-		feet from	TOC	[(*** A) (U. C	4001(9)		' 3 G1		
Depth to Bottor	m of Screen: 🥱	3.27		feet from	тьс						
Filter Top Dept	th: NA			feet from							
Filter Bottom D	Depth: NIA			feet from							
Length of Casi	ng Screened:	5		feet		1 well volur	ne (gallons)	= intial beight	of water column	1 (ft) x 0.0408 x (d	asing diameter (in)) ²
Type of Forma	tion Screened:	allus	al sand			int	tial height of	water column	(ft) = total depth	ı (ft) - intial depth	to water (ft)
Development	Method										
Equipment:	····			Drilling Me	ethods:						
Surge		Bail									
Airlift		Pump	\times								
									MANT CARLES AND		
Observations	During Develop	1				T					
		Depth to	Total	Fluid Re		Temp.	pН	S.C.	Tubidity		rance and Remarks
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	<u></u>	r, odor, etc.)
4/23/19	9:20	17.00	33.21	Ø	Ø	10.9"	7.1	0.778	DVer	bro	<u>wn</u>
4/23/19	9:25	17.00	33.21	3	3	10.5°	7.1	0.951	over	dank	greis
4/23/19	9:27	17.00	33.21	3	6	10.6°	74.3	0.942	733	(loud	
4/23/19	9:34	17.00	33-21	3	9	10.300	7:4	0.736	Over-		wh to vectoredy
4/23/19	<u>9:37</u>	17.00	33.21		12	10.2°	7.3	0.725	190	Cloud	
4/23/19	9:40	00.51	33.21	3	15	10.400	7.5	0.732	318	clou	
4/23/19	9:44	17.00	33. ə.	3	18	10.500	7.4	0.716	76.2	Slightly CLOC	
4/23/19	9:47	17.00	33. RI	3	21	10.600	7.3	0.726	43.4	Clear	
4/23/19	9:50	17.00	33.21	3	24	10.500	7.3	0.723	30.3	Clea	
4/23/19	9:54	17.00	33.21	3	27	[0.6°C	7.3	0.725	16.7	<u> </u>	ak
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nom sociarias conorwis	SALDATION PROPERTY.		· · · · ·			1	•	·		· · · · · · · · · · · · · · · · · · ·	

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Well Development Form									Page $\frac{1}{2}$ of $\underline{\lambda}$			
Project Name:	Nearman Wis	opment	Project N	15924	SW File N	lumber:		Well Name: WW-15				
Project Information						Elevation o	f Piezome	ter				
Facility Name: Nearman Pource Plant						Ground Sur	face Eleva	tion (GS):	740-2-	Ð		
Location: Kor		N 32302		E 29350	204.36	Top of Casi	ng Elevati	on (TOC):	752.8	18		
Location in Dec		LatDD:		LongDD:		Measuring F	Point Eleva	ation (MP):	752.1	83		
Well Information						Well Volume Calculation						
Date Drilled:	-9-20-1	Ð	· · · · · · · · · · · · · · · · · · ·	<u>,</u>								
Borehole Depth				feet from	65	33.62-14.32 = 19.3						
Casing Depth:	3.	2.70		feet from	TOC							
Depth to Top of		7.70		feet from	TOC	19210.	nuns)	/ - \ ⁴ -	3-15 6			
Depth to Botton	n of Screen:	32.70		feet from	TOL		~~~0)	[~] -	2-15 G			
Filter Top Dept	<u>.</u>	NA .		feet from								
Filter Bottom Depth: NIA feet from												
Length of Casin	ig Screened:	5.0		feet		1 well volume (gallons) = intial height of water column (ft) x 0.0408 x (casing diameter (in)) ²						
Type of Formati	ion Screened:	alluvial	sand			initial height of water column (ft) = total depth (ft) - initial depth to water (ft)						
Development N	Nethod				e te chi							
Equipment:	_			Drilling Me	ethods:			•				
Surge		Bail										
Airlift	_	Pump	X									
Observations I	During Developn	nent										
		Depth to	Total	Fluid Re	moved	Temp.	рH	S.C.	⊤ubidity	Fluid Appearance and Remarks		
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	(color, odor, etc.)		
4/24/19	9:38	14.32	32.62	Ø	ø	14.7%	7.8	0.718	over	dark brown		
4/24/19	9:40	14.32	<u> </u>	\$ 3.5	3.5	14.500	7.9	0.726	over	very cloudy		
4/24/19	9:43	14.32	33-62	3.5	7.0	14.2°	7.9	0.717	293	Cloudy		
4/24/19	9:51	14.32	33.62	3.5	10.5	14.000	7.8	0.712	Over	dark belowing to berey cloudy		
4/24/19	9:54	14.32	33.62	3.5	14.0	13.900	7.8	0.717	237	very cloudy		
4/24/19	10:00	14.32	33.62	3.5	17.5	14.2"	1 .8	0.717	over	darek brown		
4/24/19	10:04	14.32	<u>3</u> 3.62	3.5	24.0	13.9 **	7.9	0.709	320	very cloudy		
4/24/19	10:08	14.32	33.62	3.5	64-5 ²⁴	14.0°C	7.8	0.715	Hle	cloudy		
4/24/19	10:11	14-32	33.62	3.5	28.0	14.2 "	7.8	0.7/4	81.1	Cloudy		
4/24/19	10:18	14.32	33.lez	3.5	34.5	4.500	7.8	0.711	OVER	brown		
4/24/19	10:21	<u>[4.32</u>	33.62	3.5	35.0	14.100	7.8	0.713	41.6	Cloudy		
4/24/19	10:25	14.32	33.62	3.5	38.5	13-8°2	7.9	0.715	278	Climady		
TIGIN TOC LINES OTHERWISE	nctéo in Remarks	I		l	L	<u> </u>		<u> </u>		1		

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Well Development Form									Page <u>&</u> of <u></u>			
Project Name:	Nearman	Well Der	elopment	Project N	umber: N	15924	SW File N	lumber:		Well Name: MW-10		
Project Inform						Elevation o	f Piezom	ster				
Facility Name: Neareman Power Plant Loffenk location						Ground Surface Elevation (GS): フィムシームフィー						
Location: Kaylsas CITY, 185 N 323 08,22 E 2939131.62						⊤op of Casi	ng Elevati	on (TOC):	≈48.42	>		
Location in Decimal Degrees: LatDD: LongDD:						Measuring Point Elevation (MP): つてんちょう						
Well Information						Well Volum	ie Calcula	tion				
Date Drilled:	11-15-	- (8										
Borehole Depth: 30 feet from 65							32.56-9.60= 22.96					
Casing Depth:	32	.si		feet from	106							
Depth to Top or	f Screen: 🍕	2-5+27.	51	feet from	TOC	229616	mung) (a)2 = 3.74	1 I_			
Depth to Bottor	n of Screen: 🤰	7.51 32.9	5)	feet from	TOC	aa www.	0400) (a	1 - 3. T	401			
Filter Top Dept	h: 😪	-FINIA		feet from								
Filter Bottom D	epth: N	K	•	feet from								
Length of Casir	ng Screened:	5.0		feet		1 well volume (gallons) = intial height of water column (ft) x 0.0408 x (casing diameter (in)) ^a						
Type of Format	tion Screened:	Allword	sand			intial height of water column (ft) = total depth (ft) - intial depth to water (ft)						
Development	Method											
Equipment:		· · ·· ·· · · · · · · · · · · · · · ·		Drilling Me	ethods:							
Surge	•	Bail										
Airlift		Pump	X									
Observations	During Developn											
		Depth to	Total	Fluid Re	moved	Temp.	pН	S.C.	Tubidity	Fluid Appearance and Remarks		
Date	Time	Water* (ft)	Depth* (ft)	Gallons	Total	(degrees F)	(units)	(mS/cm)	(NTU)	(color, odor, etc.)		
<u>4/24/19</u>	13:15	9.60	32-56	<i>Q</i>	Ý	17.5"	7.0	1.134	F.58	Slightly cloudy		
4/24/19	13:19	9.60	32.56	<u>ч</u>	ч	17.0"	7.0	1.18	7.84	· clean		
4/24/19	13:23	9.60	32.56	4	8	17.1**	70	1.16	2.47	cleare		
4/24/19	13:28	9.60	32.56	4	12	16.6%	<u></u>	1.10	24.5	(e ene		
4124/19	13:32	9.60	32.56	4	16	16.900	7.0	1.17	-7-08 36.7	(lease		
4/24/19	13:39	9.60	32.56	4	20	110.900	<u>0.</u>	1.16		(leave		
4/24/19	13:44	9.60	32.56	4	24	16.800	7.0	1.17	8.94	Clean		
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Thom - OC unles rotherwis	e hoted in Remarks	<u> </u>				ŀ	<u> </u>	1				

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, ţ	Monday, Apr: 122, 2019 115929 Jikimania	Tresday, April 13,004 115974 Jiterannon 1
- 2	Task Well Development	Taski basell Development
	Wenter 705 5-15 mph 5~ , mestly clandy	Weatler 705, 5 mph orrecust
	Passonael: Olivia Honey + Jonathan Hermanson	Personnel: Okivia Hunry & Januar Hermison
	(630: battle equipment & mub to Field Environment	0700: Moto to site
	1045! (heck in Q Weirmun ganed shack	0700. Acrim on sile + electria w/ gand 100.98
	1100: Accine QV-3-HIC to develop TO: 133.415 MULTAGE	0730: Sel up G. 2.1 W2:1405 TD 1238
	1125: Beyin vell development	0750; Boy a well decelopment C 2-1
	1130; Meet mil B. Hoyce & S. Mastin	1983: Complete Development C. 6-1
	Bus: Beyin nell Development	0900 Decon equipment + more to set up @ MW-14
	1330: le mpletre will Deulepment @ P-3	TU: 33.21 NU: 17.00
- 4	1540: Deen Dento men equipment and more to	0920: Begin will development C. MW-312
N 82	P-1 to set up TD: 1940 1935	0455: implete well dovelopment @ MU-11
	1400: Bey's will Decelopment @ P-1	1000 Drive philpmont & x1 up @ P24W TO 120.30 WE: 24.75
	1495. Bren Sufficies dead, I main primp att can	1025 Begin well Development (2 Ago D2-LW
	salay	we Blown the on controller, papop stopped rosching
Ě	5:101 timplich nell Develupment @ P-1	Eschalton pollution of called ELE bloom too
	1550 Deven Operioperat spuipment and more to	11651 160time well Development @ Partin
	P-2 to set up TO: 132.90 ~ 17.33	1305 lompuse well develop most @laws
૾૱	1620 Beyrn will Development @ P-2	1230 . Devon equipment + more to TH-3 to situa
	1720: lomplete null Development @ P.2	<u>TO 134.33</u> <u>~18.00</u>
	1935; Devon Development equipment and more to	Bry's cell development
	74-4 to set up ID: 107.60 wii 17.21	1245 tase popped, replacing the
	1740: Bry a will Doulop.ment C. THI-M	1325 Contrare purging TH-4
Je	18301 lompie k will perelopment @ TH-4	1235 Fuse pop cull B. Hoge & FRE dor
	1855: Ducon your + signize tor to morriso	Silution will regive fine to continue using
	1910 Thick out wil barred, call B. thyse, alessite	CUNTROLLE. FREE Will Replace controller & Frees.
	for Umin	1355 Continue progry TH3 Retern de Run
1.20		

Or Harry J. Kumansin - 4-23-19 115 924 1305 ileroptets well development C IM-3 -1510 Decor apripment and set of Co MW-1) -10:30:53 Wil 1623 1552 : Bey n well development @ MW-11 ____ 1600 : lempiete vell decelopment @ MW-11 1605 ! Deven can't went & clean up by he day 1615: Check and my geord & off-site

P. Garage 6-14 naster 3, Apr 184, 249 115 424 ____ 7 here and Tershi well Development Matter. 305, 5 mph as available party doing Reconn': On via Have at Sandton Hermanson 0798 Barrie construct a check in call Marchine for ch open prime @ THA to proto hall _____ 0445: Obstraction @1222 weake to push pump form wither Bringe be material in will subject mp -@ 33 A not swege well screen. brief 1 willions will be drawn. Development with stop when primiting 155.1724 TO: 15.07 - W621330 alise by well prover mon & This 18610. Beyin Total Dephy going my 133.50 much being ୧୨ 19.69 buch boits m 1 23.19 some soil, rode but bin. 132.95 hard build φ-**λ** hard nation 33.24 1-1-19 survey at bottom 107.36 -YH-4 ____12.1-05 Inaid bushow 82.44 134 .90 huis be ton TH-3 9,5. 6.2 hand beginn - our curling 14.3 MININ 30.54 herd bottom 0903 Computer well Divelopment CINA versi prior equipsion + set of C mwrig 10:3:63 1000 ! lompute nel' Deulephone C Merischer action

0. Henry O. Hunner "4-24-19 11584 J. Terminia 4 24-19. 11624 3. Turnings in 1110: Devon appropriat & set up C mu.B. 1855: Lomplete development of muila TO: 33.4D. W. 9.30 1900 : Chenning Equipment, which out will grind 1140: Busin purging musers to colectlopment 1915 - Off-site 12451 Complete development @ MW-13 Use Deven cyniphent for at up @ MW-16 TD 32.56 26 19 960 Bis: Bigin will paulopment C MW-16 1345: 10mplete vell Deulopment @ min-10 BSS: Decan equipment & set up @ mw-8A W1-14.57 TO: 35.06 1415 : Boy's cell Decelopment @ mw-gA 1505: Complete well Development CMW-et BIS: Pecon equipment & set up & mar-10 TD : 29.64 LU: 930 1530 : Bigin nell' Development @ nur-co 1600: Genplete will Development C. MW-10 1605 - Docus decelopment equipment the up C Must TD: 31.65 WL: 10.96 1625 : Beylin well Decelopment @ MW-2A 1655 : 10 millete well Decelopment @ MNDZA 1700: Decon development equipment to set up @ MWH2 1730 Bigin decilopmentof MW-12 TP1313" NL: 8.34 had bottom, but . 3' Jugs them excelled Constracted depth 1810: parmp pulsing and shutting ste, lucitly for articles, drugententing, pumping normally 1830 : Construct purging ML+ PD Kite in sty hai

O. Harrey 8 Paril 25, 2019 _____ (1524 _____ J. He margon <u>4-15-19</u> 113A4 J. tommon _ Tratic well Development_ 1920 Bejic Justemment Comers Letter : 500 600, 5 mph no, dinse tay to partly cloudy -- D: 3317 Personnel: Jonethin Humanson & Olivis Human 1932 Revent brilling _ 2 2 793 - promp - -0930 Acchine and check on algours. 1530 Camplek will development @ mw. 3 \$335. Atlengt to get governor, le Brann inversitedle 18120: Q. MW-4 to measure to sal depr 0940: truna lite used be non goodor team pond TD 31.90 to truch, general direct dans in tunite 16:26 @ MW-7 to measure total depu 0723: Late muy: the gals needing + seles neering TD: 49.72 0825. At MW9 to stup TO: 60.05 w2: 15.18 Will betain to develop MW-EL & MU-7 0910: Brg & proglag MW-9 1635: Check out wit Nearman gauged 1000 : Call C. Hinfland, Dalg game P Batter bogs from 1635 Off-sive Start of program surge encyster will varme, Suga are more block & write the brobally to set he 1020% long live well development @ mug 10:35: Path up it doesn chargement 1100' more be set up @ MW-6 TO: 42.01 NE: 19.25 180: Begin pasqing MW-6 61 well development 1235 : laspiete nell divelopment & muito 1241: 12 curs ap - equipment when pulling grates prop out of meli, pump become stuck @ TO. APhr attempting to part it out and finding we rough Litterly will leave pump and hose in well while when for outton will proceed to MA-3 st prop m/ 2" prop t sige m/ proposited 1315 " Clean 2" group cuble & Arbing Kete in the Khim

	10 4-26-19 MANEY/SCHUTTS	April 29,2019 115924 J. Hermonyon
	0845 Merly c OFFIL LLOND SUPPLIES +	Tusk: Well Diversment
	TAVIGATI precha	Wards' Eos, 5-10 mphw, anercast
	0745 Lema ILC OFFICE	Passanel: Josephian Kermonson
	0830 AMAM on-sile / Sign on C GATE.	1020: pr-sile from Hew ganging @ mw-6
	0345 Set up & MW-4	<u>TD: 43.48' bgs </u>
	0650 colubrate pH reams mater, JUAB miling	Removed 3 sailers to see it sediment had
	WEMHER: 60° FI clean sthies, com, style	settled to bottom what pump remain , where remaind
A.	trure out of 5in-	whe show with no sign at ordinant on boiles -
2011 - 2012 - 2013 - 20	0910 minson - 70 C MC2-4 31.90 4-9.02	1040: DFB ste m return themeny
	$\frac{6WV}{905}$	1105: Sec up @ MW-1B TO: 39.30 wui 6.90
and the second of	0990 Fina Runpy 90 juli C Comession	1130 Bega proging Mrs. 18 for well Downlopment _
	End TD= 31.90 + Bothom is HARD	1138: Battay dead, will replace & continue
	1030 Sel JPC MW-7 MU2 15,93 70:49.68	idyo: Jeward botting dead atter 6 well volumes
	1330 hand Durloond TD: 49.87	proper, all primetes study tubilly is 512
	1400 Anam e mu-6	will prove peptine month buttery & continue
ter and the second s	1415 Row will comen jonen de Vieni 51 - 20	1315: At mw-6 to attil bailes, some
	on top of Runp	sectional setural to bottom of biller TO: 42.50'025
1	+ worken is ving downy, Marris to see electrul	13 20: 044.5the
ender Carlos III	Jine, Assume dos ariness 10, 19 responde to	1425: UN-STE to continue mell development
	sedmit & bothin of will willy in pring, Also	1501: Complete will development & MW1B
S. C. S. S. S. S. S. S.	- look & ongod TDS + constant 7.00 +	1508: Decon lynip
	nessunt to Top of prings	1313: Oft -site
S. 1997 (1997)	1500 Hole 1- pull op 4" pump	Anthan 11
	Fried TD = 43.48' From 42.91'	
	# Then my be som Fine Sicos C	fistim burnan 41 darig
· · · · · · · · · · · · · · · · · · ·	1-26-14	Pate in the Paint -
· · · · · · · · · · · · · · · · · · ·		

			Gro	undwater monitoring v	vells			
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	pН	Temp©	Ft. Water (after)	Ft.Ground (after)
2A	14:00	5.75	31.45	31.68			5.7	31.45
	14:05	Not Measured	Not Measured	Not Measured	7.01	23.4	Not Measured	Not Measured
30 gal purged	14:10	Not Measured	Not Measured	Not Measured	6.99	19.3	Not Measured	Not Measured
	14:14	Not Measured	Not Measured	Not Measured	6.98	19.1	Not Measured	Not Measured
	14:20	Not Measured	Not Measured	Not Measured	6.97	17.2	Not Measured	Not Measured
	14:23	Not Measured	Not Measured	Not Measured	7.01	17.2	Not Measured	Not Measured
	14:26	Not Measured	Not Measured	Not Measured	6.99	16.2	Not Measured	Not Measured
MW-3	10:18	5.05	33.75	33.96	7.11	Not Measured	5.2	34.25
	10:18	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
115 gal purged	10:19	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:20	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:22	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:23	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:24	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:25	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:27	Not Measured	Not Measured	Not Measured	7.11	Not Measured	Not Measured	Not Measured
	10:28	Not Measured	Not Measured	Not Measured	7.01	20	Not Measured	Not Measured
	10:29	Not Measured	Not Measured	Not Measured	6.98	18.8	Not Measured	Not Measured
	10:30	Not Measured	Not Measured	Not Measured	6.95	18.2	Not Measured	Not Measured
	10:32	Not Measured	Not Measured	Not Measured	6.91	17.1	Not Measured	Not Measured
	10:33	Not Measured	Not Measured	Not Measured	6.92	16.8	Not Measured	Not Measured
	10:34	Not Measured	Not Measured	Not Measured	6.91	16.4	Not Measured	Not Measured
	10:36	Not Measured	Not Measured	Not Measured	6.9	16.3	Not Measured	Not Measured
	10:37	Not Measured	Not Measured	Not Measured	6.89	15.9	Not Measured	Not Measured
	10:38	Not Measured	Not Measured	Not Measured	6.91	15.7	Not Measured	Not Measured
	10:39	Not Measured	Not Measured	Not Measured	6.87	15.7	Not Measured	Not Measured
	10:40	Not Measured	Not Measured	Not Measured	6.88	15.5	Not Measured	Not Measured
	10:41	Not Measured	Not Measured	Not Measured	6.87	15.3	Not Measured	Not Measured
	10:42	Not Measured	Not Measured	Not Measured	6.86	15.2	Not Measured	Not Measured
	10:44	Not Measured	Not Measured	Not Measured	6.86	15.2	Not Measured	Not Measured
	10:45	Not Measured	Not Measured	Not Measured	6.86	15.2	Not Measured	Not Measured

			Grou	undwater monitoring v	vells			
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	рН	Temp©	Ft. Water (after)	Ft.Ground (after)
MW-4		2.3	31.61	31.9			2.37	31.7
	10:21	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
120 gal purged	10:22	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:25	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:27	Not Measured	Not Measured	Not Measured	7.42	29.6	Not Measured	Not Measured
	10:30	Not Measured	Not Measured	Not Measured	7.43	24.8	Not Measured	Not Measured
	10:31	Not Measured	Not Measured	Not Measured	7.4	21	Not Measured	Not Measured
	10:32	Not Measured	Not Measured	Not Measured	7.41	19	Not Measured	Not Measured
	10:33	Not Measured	Not Measured	Not Measured	7.41	18	Not Measured	Not Measured
	10:34	Not Measured	Not Measured	Not Measured	7.38	16	Not Measured	Not Measured
	10:35	Not Measured	Not Measured	Not Measured	7.34	16	Not Measured	Not Measured
	10:36	Not Measured	Not Measured	Not Measured	7.31	16.1	Not Measured	Not Measured
	10:37	Not Measured	Not Measured	Not Measured	7.3	16	Not Measured	Not Measured
	10:38	Not Measured	Not Measured	Not Measured	7.3	16	Not Measured	Not Measured
	10:39	Not Measured	Not Measured	Not Measured	7.2	16	Not Measured	Not Measured
	10:40	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:41	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:42	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:43	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:44	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:45	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:46	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:47	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:48	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:49	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:50	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:51	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:52	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:53	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:54	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:55	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	10:56	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured

	Groundwater monitoring wells											
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	pН	Temp©	Ft. Water (after)	Ft.Ground (after)				
MW-8A		9.35	34.95	35.17			9.4	35.05				
	11:32	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured				
40 gal purged	12:04	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured				
	12:13	Not Measured	Not Measured	Not Measured	7.39	21.9	Not Measured	Not Measured				
	12:19	Not Measured	Not Measured	Not Measured	7.41	20.8	Not Measured	Not Measured				
	12:24	Not Measured	Not Measured	Not Measured	7.4	19.2	Not Measured	Not Measured				
	12:29	Not Measured	Not Measured	Not Measured	7.41	18.5	Not Measured	Not Measured				
	12:34	Not Measured	Not Measured	Not Measured	7.4	18.1	Not Measured	Not Measured				
	12:38	Not Measured	Not Measured	Not Measured	7.41	18.5	Not Measured	Not Measured				

			Gro	undwater monitoring v	vells			
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	рН	Temp©	Ft. Water (after)	Ft.Ground (after)
MW-9		8.01	63.3	61.4	Not Measured	Not Measured	Not Measured	Not Measured
	15:53	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
225 gal purged	15:54	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	15:55	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	15:56	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	15:57	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	15:58	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	15:59	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:00	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:01	Not Measured	Not Measured	Not Measured	7.25	22	Not Measured	Not Measured
	16:02	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:03	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:04	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:05	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:06	Not Measured	Not Measured	Not Measured	7.21	18.1	Not Measured	Not Measured
	16:07	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:08	Not Measured	Not Measured	Not Measured	7.2	16.9	Not Measured	Not Measured
	16:09	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:10	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:11	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:12	Not Measured	Not Measured	Not Measured	7.17	16.3	Not Measured	Not Measured
	16:13	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:14	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:15	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:16	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:17	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:18	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:19	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:20	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured

			Gro	undwater monitoring v	vells			
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	рН	Temp©	Ft. Water (after)	Ft.Ground (after)
MW-9	16:21	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:22	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:23	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:24	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:25	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:26	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:27	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:28	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:29	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:30	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:31	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:32	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:33	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:34	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:35	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:36	Not Measured	Not Measured	Not Measured	7.27	Not Measured	Not Measured	Not Measured
MW-10		3.325	29.4	29.65	Not Measured	Not Measured	4.4	29.4
	12:14	Not Measured	Not Measured	Not Measured	7.33	20.3	Not Measured	Not Measured
30 Gal purged	12:18	Not Measured	Not Measured	Not Measured	7.31	17.2	Not Measured	Not Measured
	12:22	Not Measured	Not Measured	Not Measured	7.26	16.9	Not Measured	Not Measured
	12:26	Not Measured	Not Measured	Not Measured	7.26	16	Not Measured	Not Measured
	12:30	Not Measured	Not Measured	Not Measured	7.26	16.2	Not Measured	Not Measured
	12:34	Not Measured	Not Measured	Not Measured	7.26	16	Not Measured	Not Measured
MW-11		8.9	30.27	30.6	Not Measured	Not Measured	8.91	30.35
	14:07	Not Measured	Not Measured	Not Measured	6.6	22.8	Not Measured	Not Measured
25 gal purged	14:10	Not Measured	Not Measured	Not Measured	6.55	18.7	Not Measured	Not Measured
	14:14	Not Measured	Not Measured	Not Measured	6.56	17.2	Not Measured	Not Measured
	14:20	Not Measured	Not Measured	Not Measured	6.57	16.7	Not Measured	Not Measured
	14:27	Not Measured	Not Measured	Not Measured	6.58	15.3	Not Measured	Not Measured

			Gro	undwater monitoring v	wells			
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	pН	Temp©	Ft. Water (after)	Ft.Ground (after)
MW-12		7.34	31.05	31.38	Not Measured	Not Measured	7.35	31.1
	13:53	Not Measured	Not Measured	Not Measured	6	19.6	Not Measured	Not Measured
25 gal purged	14:07	Not Measured	Not Measured	Not Measured	6	18.7	Not Measured	Not Measured
pH and Temp Meter	14:21	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
Ran out of battery	14:35	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	14:53	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
MW-13		4.05	33.2	33.48	Not Measured	Not Measured	4.09	33.22
30 Gal purged	15:40	Not Measured	Not Measured	Not Measured	7.02	19.8	Not Measured	Not Measured
	15:44	Not Measured	Not Measured	Not Measured	7.13	18	Not Measured	Not Measured
	15:48	Not Measured	Not Measured	Not Measured	7.16	17.1	Not Measured	Not Measured
	15:52	Not Measured	Not Measured	Not Measured	7.2	17.2	Not Measured	Not Measured
	15:56	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured	Not Measured
	16:02	Not Measured	Not Measured	Not Measured	7.1	18.9	Not Measured	Not Measured
MW-14		13.53	33.025	33.27	Not Measured	Not Measured	13.235	33.025
20 gal purged	14:19	Not Measured	Not Measured	Not Measured	6.84	17.5	Not Measured	Not Measured
	14:26	Not Measured	Not Measured	Not Measured	7.11	14.2	Not Measured	Not Measured
	14:33	Not Measured	Not Measured	Not Measured	7.2	14.3	Not Measured	Not Measured
	14:39	Not Measured	Not Measured	Not Measured	7.2	12.6	Not Measured	Not Measured
MW-15		5.65	32.45	Not Measured	Not Measured	Not Measured	5.65	32.5
30 Gal purged	11:56	Not Measured	Not Measured	Not Measured	7.05	15.1	Not Measured	Not Measured
	11:59	Not Measured	Not Measured	Not Measured	7.82	13.2	Not Measured	Not Measured
	12:01	Not Measured	Not Measured	Not Measured	7.79	13.3	Not Measured	Not Measured
	12:04	Not Measured	Not Measured	Not Measured	7.73	10.6	Not Measured	Not Measured
	12:06	Not Measured	Not Measured	Not Measured	7.71	9.9	Not Measured	Not Measured
	12:09	Not Measured	Not Measured	Not Measured	7.69	9.3	Not Measured	Not Measured

	Groundwater monitoring wells											
Monitoring Well ID	Time	Ft.Water (before)	Ft. Ground (before)	(ft.bTOC)	pН	Temp©	Ft. Water (after)	Ft.Ground (after)				
MW-16		4.65	32.4	32.51	Not Measured	Not Measured	4.7	32.4				
30 Gal purged	15:16	Not Measured	Not Measured	Not Measured	6.73	22.3	Not Measured	Not Measured				
	15:18	Not Measured	Not Measured	Not Measured	6.74	19.8	Not Measured	Not Measured				
	15:21	Not Measured	Not Measured	Not Measured	6.74	19.2	Not Measured	Not Measured				
	15:23	Not Measured	Not Measured	Not Measured	6.74	18.2	Not Measured	Not Measured				
	15:26	Not Measured	Not Measured	Not Measured	6.73	17.7	Not Measured	Not Measured				
	15:29	Not Measured	Not Measured	Not Measured	6.78	17.7	Not Measured	Not Measured				

APPENDIX D – GROUNDWATER SAMPLING FIELD DOCUMENTATION

			FIELD G	ROUND-WA	ATER SAMPL	ING REPO	DRT		
DATE:	7-1-19	SITE:	Nearn	nan - CCR	PID READING	i at WELL HE	AD (ppm):		No 6700 pro destante das 1890 media
			M	/EATHER:	9 <u>05, 5-10 m</u>	phu,	Dully	il onch	
WELL N					/	(/		د —	
·			1	D	EPTH TO WATE	ER (ft): <	82		
л	nw-21	\							
PURGIN	G			TAL DEPTH (f	t): <u>NA-pmp</u>	Well Diam	ETER (inche	s):	-
CASING	VOLUME)N:ft	of water X in casing	gallons/ = foot	total gallor	ns/casing volu	ıme	
Equipme	ent Used: D	edicated Blad	Her Pump	>Nondedicate	ed Bladder Pump) Bailer C)ther		-
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1600	Ţ	300	6.93	15.11	0.652	47.5	-20.4	2.05	5.82
1505	0.40	300	6:88	14.45	0.627	7.29	-28.7	1-46	532
1510	0.30	300	6.86	14.30	0.625	Bdg 4	-34.9	0.92	5.82
1515	660	300	6.94	14.25	0.627	Baly	-40.5	0.71	2.35
1520	1.60	300	6.83	14.23	0.627	4.25	- 44 0	0.50	5.32
1525	2,00	300	6,85	14.25	6,627	3.67	- 45.0	0.95	5,32
1530	2.40	300	6.85	14.26	0.67	3,81	-47.1	0.43	5,82
			Cc	ontinued on ba	ck (circle one) y	res / බී	· · · · · ·		
SAMPLIN	<u>NG</u>	Equipme	nt Used: 🏾 🏾 🌾	ame as above	Other				· · · · · · · · · · · · · · · · · · ·
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		.ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1535	2.60	6.85	14.26	0627	3.81	-47.1	0,43	5.92	<u> </u>
		VATER (ft TO		2	TIME FINAL DE	EPTH TAKEN	I:	5-153	5
SAMPLE	ID: <u>W</u> V	-2A161	[U]	SAMPLE	ID FOR QC:	Bup-1/	GNUI		
PARAME	ETERS REC	QUESTED FO	R ANALYS	SIS:	ix III & IV Para	meters			
					TAL: 240 g				
		YS1 556 N			10				
				EAKS: 4/ CO	DMMENTS: <u>A</u>	JA			
				12					
		<u>NAME</u>		S	IGNATURE			DATE	
PREPAR	RED:	onathan Hei	manson		Um dem	w	7-1	1-19	· ·
REVIEW	ED:			(
	<u> </u>								

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			FIELD G	ROUND-W/	ATER SAMPL	ING REPO	DRT		
DATE:	7-1-19	SITE:	Nearn	1an - CCR	PID READING	at WELL HE	:AD (ppm): _	<u></u>	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>
PROJEC	T NUMBER	R: 88777	W	/EATHER:	905, 5-10.	mph SLU	, paity	llondy	
WELL N						1 	_		
				D	EPTH TO WATE	ER (ft):	-15		
N	NW-3				t): Norm-prop		ETER (inches	~ ~	
PURGIN	G		10	IAL DEPTH (I	U: Nora-lance -			s). <u> </u>	
CASING	VOLUME (CALCULATIC)N: ft	of water X in casing	gallons/ = foot	total gallor	ns/casing volu	ume	
Equipme	nt Used:	edicated Blac	ider Pomp	Nondedicate	ed Bladder Pump	b Bailer C	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)
160	I	305	6.86	1559	0.717	21.4	-6.8	0.34	7.95
1615	0.40	300	6.32		0.701	15.3	-12-8	0.13	7.95
1620	0.60	300	(.7 <u>8</u>	15.49	6.696	10.22	-22.4	6.06	7.95
1625	1.20	300	6.77	14.42	0.146	8.70	~~~~~~.4 ~~~~.4		7.95
1630	1.50	308. Jeo	6.77	15.4 <u>2</u> 15.51	0.695	7.24	- 30.1	0.07	7.95 7.97
1635	7.40	300	6.74	15.53	0.697	4.87	-35.5	0.01	795
	2.010			-			······		
·					· · · · · · · · · · · · · · · · · · ·				
				intinued on ba	ck (circle one) y	res / 🔊			
<u>SAMPLIN</u>	<u>1G</u>	Equipme	nt Used: S	ame as above	e Other		,		
Sample	Tota		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	
Time (24 hr)	Purge gals		(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.
1645	2.40		15:53	0.697	4.87	-35.5	0.01	7.95	
FINAL DI		VATER (ft TO	(C): 7.9	95	TIME FINAL DE		1: 1645	22a, .	
		+3/6mm			ID FOR QC;				
				Appendi	ix III & IV Para	meters			
PARAME			ANAL IV			7 . J			
				IDW TC	TAL: 2.40	981			
		YSI 556 N							
CHECKĘ	D FLOW T	HROUGH CE	ELL FOR LI	EAKS:-🛒 CO	OMMENTS:	UA			
		NAME			IGNATURE			DATE	
	, J	onathan Hei	rmanson		m Hannes	K	7-	1-19	
					<u></u>				
REVIEW	ср	<u> </u>		<u></u>				<u> </u>	

		-	FIELD G	ROUND-WA	TER SAMPL	ING REPO	DRT		
DATE:	3-2-19	!SITE:	Nearn	nan - CCR	PID READING	at WELL HE	AD (ppm): _	an 1990 - The second state from the second state of the second state of the second state of the second state of	an in the second se
PROJEC	T NUMBER	R: <u>88777</u>	N	/EATHER:	715,0-5	neh~,	<u>clei</u> r	<u>۶</u> ش	
WELL N	UMBER			· · · •	EPTH TO WATE		16		
			7	Ņ	EPTH TO WATE	=R (π): <u>ι</u>			
M	1-1-1-1		то-	TAL DEPTH (ft): <u>Nm-pmp</u>	well diam	ETER (inche	s): <u>2</u>	
PURGIN	G			·	·				
CASING	VOLUME C	ALCULATIO	N:ft	of water X in casing	_galions/	total gallor	ns/casing volu	ime	·
Equipme	nt Used: 🏼 🛛 🕅	edicated Blāō	lder Pump	Nondedicate	d Bladder Pump) Bailer C	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)
CZYS		300	G.U6	12.15	0.666	236	7.9	3.05	14.10
0750	0.40	300	6.94	11.28	0.690	7.3	-18.7	2.24	14.10
0755	0.90	300	6.88 6.90	11.19	0.690	11.Q 7.52	-24.4 -28.7	<u>-83</u> 1.79	14.10
0809 0809	1.20	300	6.93	11.09	0.689	4.1G	-30.4	1.80	14.10
0.007	V~		0						
								·	
.					·				
			Cc	ntinued on bac	ck (circle one) y	es / 17			
SAMPLIN	NG	Equipme	nt Used: S	Same as above	e Other		r 141.		
Sample Time	Total Purge		Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	.ORP (mV)	D.O. (mg/L)	Depth to Water	Obs.
(24 hr)	(gals)		(0)	0.684	(N103)	-30.U	1.80	(ft TOC) 1は.い	
090					<u></u>		-		
		VATER (ft TO			TIME FINAL DE		1: 0810		
SAMPLE	ID: <u>MU</u>	~14/6w	<u>) \</u>						<u></u>
PARAME	ETERS REC	UESTED FC	R ANALYS	SIS: <u>Appendi</u>	x III & IV Para		.	••	
FERROL	JS IRON (m	g/L):		IDW TO	TAL:6	o gal			
METER	MODEL No.	YSI 556 N	APS						
CHECKE	ED FLOW T	HROUGH CE	ELL FOR LE	EAKS: 💋 CO		<u> MA</u>			
		NAME		a <u>si</u>	GNATURE IM Anna			DATE	
PREPAR	т	onathan Her	manson	// 1	LARA Maria	- 4		1 7 14	
1110170	RED:				84. M. W			- do 1	

	2-2-19	SITE:	Nearr	nan - CCR	PID READING	at WELL HE	AD (ppm):		
PROJEC	T NUMBE	R: <u>88777</u>	V	VEATHER:	8 03, 5-10 m	en ~ c	lens she	<u></u>	
VELL N	UMBER							•	
				, Ľ	EPTH TO WAT	ER (ft):) <u> </u>		
٧	<u>ww-4</u>	·	то	TAL DEPTH (f	t): <u>NMp:np</u>	WELL DIAM	ETER (inche	es): Z	
URG]N	IG			······································	/ <u>(</u>		X	-	, 2 11
ASING	VOLUME	CALCULATIC)N:fi	of water X in casing	gallons/ = foot	total gallor	ns/casing vol	ume	
quipme	ent Used: 🤇	Dedicated Blac	lder Pump	>Nondedicate	ed Bladder Pump	o Bailer C	Other		_
Time 24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC
ros	I.	300	7.49	16-68	0.575	10.54	(3.0	6.95	4.62
910	0.40	300	3.32		0.509	8.22	-23.1	3.41	4.62
M15	0.30	300	7,27		0.509	5.19	-23.8	3.36	4.62 4.62
920	1.9-0	Z 7 0	4.2 9	14.66	0.504	4.36	~~1.>	<u></u>	
		·	 	 Infinued on ba	ck (circle one) y	es / no			
		<u></u>				awe			
			nt Usedi 🕻 🕄	same as above	e Other				
AMPLI	NG	Equipme	~						
AMPLII Sample		al	Temp	Conductivity		ORP	D.O.	Depth to Water	Ohe
Sample Time		al ed pH s)		······································	(NTUs)	(mV)	(mg/L)	Depth to Water (ft TOC)	Obs.
Sample	Tota Purg	al ed pH	Temp	Conductivity			U.U.	Water	Obs.
Sample Time (24 hr) 445 INAL D	Tota Purg (gal ارجار	al ed pH s) 7.21 WATER (ff. TC	Temp (C) 14.66	Conductivity (mmhos/cm)	(NTUs)	(mV) - 34 . 5	(mg/L)	Water (ft TOC)	Obs.
Sample Time (24 hr) 945 INAL D AMPLE	Tota Purg (gal 1.20 EPTH TO 1	al pH s) 7.29 WATER (ff TC V- 4 / 6.00	Temp (C) 14.66 DC): <u>4.6</u>	Conductivity (mmhos/cm) 6.509	(NTUS) 4. ß TIME FINAL DE	(mV) - 34 · 5 EPTH TAKEN	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 945 INAL D AMPLE	Tota Purg (gal 1.20 EPTH TO 1	al pH s) 7.29 WATER (ff TC V- 4 / 6.00	Temp (C) 14.66 DC): <u>4.6</u>	Conductivity (mmhos/cm) 6.509	(NTUS) 4. ß TIME FINAL DE	(mV) - 34 · 5 EPTH TAKEN	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 945 NAL D AMPLE ARAMI	Tota Purg (gal 1.29 EPTH TO EID: MA	al ed pH s) 7.39 WATER (ff TC V-9[6000 QUESTED FC	Temp (C) 14.66 DC): 4.66	Conductivity (mmhos/cm) 6.509 SAMPLE SIS: Append	(NTUS) 4. 136 TIME FINAL DE ID FOR QC: ix III & IV Para	(mV) - 34 · S EPTH TAKEN Meters	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 945 INAL D AMPLE ARAMI ERROL	Tota Purg (gal 1.29 EPTH TO EID: *** ETERS RE JS IRON (r	al ed pH s) 7-29 WATER (ff TC V-9[6000 QUESTED FC ng/L):	Temp (C) 14.66 DC): <u>4.6;</u> DR ANALY:	Conductivity (mmhos/cm) 6.509 SAMPLE SIS: Append	(NTUS) 4. ß TIME FINAL DE	(mV) - 34 · S EPTH TAKEN Meters	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 445 INAL D AMPLE ARAMI ERROU	Tota Purg (gal 1.20 EPTH TO EID: VVV EID: VVV ETERS RE JS IRON (r MODEL NO	al ed pH s) 7-39 WATER (ff TC V- 9 /6 QUESTED FC ng/L): YSI 556 M	Temp (C) 14.66 DC): 4.63 DR ANALY: - MPS	Conductivity (mmhos/cm) 6.509 SAMPLE SIS: Append	(NTUS) U.BC TIME FINAL DE ID FOR QC: ix III & IV Para DTAL:	(mV) - 34 · S EPTH TAKEN meters	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 445 INAL D AMPLE ARAMI ERROU	Tota Purg (gal 1.20 EPTH TO EID: VVV EID: VVV ETERS RE JS IRON (r MODEL NO	al ed pH s) 7-39 WATER (ff TC V- 9 /6 QUESTED FC ng/L): YSI 556 M	Temp (C) 14.66 DC): 4.63 DR ANALY: - MPS	Conductivity (mmhos/cm) 6.509 SAMPLE SIS: Append	(NTUS) 4. 136 TIME FINAL DE ID FOR QC: ix III & IV Para	(mV) - 34 · S EPTH TAKEN meters	1:	Water (ft TOC) 4.62 920	Obs.
Sample Time (24 hr) 445 INAL D AMPLE ARAMI ERROU	Tota Purg (gal 1.20 EPTH TO EID: VVV EID: VVV ETERS RE JS IRON (r MODEL NO	al ed pH s) 7.29 WATER (ff TC V- 4 6 QUESTED FC ng/L): YSI 556 M FHROUGH CE	Temp (C) 14.66 DC): 4.63 DR ANALY: - MPS	Conductivity (mmhos/cm) G.SO9 SAMPLE SIS: Append IDW TC	(NTUS) 4.36 TIME FINAL DE ID FOR QC: ix III & IV Para DTAL: OMMENTS:	(mV) - 34 · S EPTH TAKEN meters	1:	Water (ft TOC) 420	Obs.
Sample Time (24 hr) 945 NAL D AMPLE ARAMI ERROL	Tota Purg (gal 1.20 EPTH TO ED: ETERS RE JS IRON (r MODEL NO	al ed pH s) 7-39 WATER (ff TC V- 9 /6 QUESTED FC ng/L): YSI 556 M	Temp (C) 14.66 DC): <u>4.6;</u> DR ANALY: 	Conductivity (mmhos/cm) C.SO9 SAMPLE SIS: Appendi IDW TC EAKS: X- Co	(NTUS) U.BC TIME FINAL DE ID FOR QC: ix III & IV Para DTAL:	(mV) - 34 · S EPTH TAKEN meters	1:	Water (ft TOC) 4.62 920	Obs.

			FIELD G	ROUND-W	ATER SAMPI	ING REPC	DRT		
DATE:	7-1-19	SITE	: Nearn	nan - CCR	PID READING	at WELL HE	AD (ppm):	<u></u>	- Pridus partos di amende aportos. -
				EATHER:	903, 0-5	MONSW.	partine	(w-dy	
WELL N							1 -		
	OMBER			, L	DEPTH TO WAT	ER (ft):	30		
n	NN-8A							\sim	·
L		<u> </u>	TO	TAL DEPTH (ft): <u>NM-pamp</u>	Well Diam	ETER (inche	s):	
PURGIN							· ·		
CASING	VOLUME (CALCULATIO	DN:ft	of water X in casing	gallons/ = foot	total gallon	is/casing vol	ume	
Equipme	ent Used: D	edicated Bla	dder Pump	0	ed Bladder Pum	o Bailer C)ther		
	Amount			,		Translation it.	000		Depth to
Time (24 hr)	Purged	Flow Rate (ml/min)	pH .	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Water (ft TOC)
1240	(gals) F	300	7.16	17.70	0.958	Notre-11-2	-32.3	2.27	9.80
·245	0.46	300	7.13	16.12	0.754	Not-roading	-39.8	0-15	9.80
250	0.90	300	7.10	15.84	0.753	.30.8	-65.3	0.07	9,80
1255	1.20	300	7.11	15.83	0.762	25.0	-78.3	0.06	9.80
1300	1,60	300	7.11	15.80	0.767	21.6	- 85.7	0.04	9.80
1305	2.00	300	7.12	15,85	0,771	18.3	-89.9	÷ .	9.80
1310	2.40	300	7.12	15.86	0.773	15.7	-91.9	6.06	91.30
1315	2.00	300	7.12	15,82	0.740	12.4	-930	603	9.30
1320	3.20	300	7.14	15.76	0.787	11.25	-933	0.02	ମି. ଓ ଠି
				ontinued on ba	ack (circle one) 🐧	es logo			
<u>SAMPLII</u>	NG	Equipme	nt Used: 🐇	Same as abov) Other				
Sample			Temp	Conductivity	/ Turbidity	ORP	D.O.	Depth to	
Time (24 hr)	Purge (gals		(C)	(mmhos/cm		(mV)	(mg/L)	Water (ft TOC)	Obs.
1405	··	~~~~	15.65	0.826	4.69	-94.4	0.00	9.80	When this
				0	· ·		(110)	~	Later Ski jhteg
					TIME FINAL D		·		
SAMPLE	e id:	W19A	_		ID FOR QC:		Gwams	INSD	
PARAME	ETERS REC	QUESTED FO	OR ANALYS	SIS: <u>Append</u>	lix III & IV Para	ameters			
FERROL	JS IRON (m	ng/L):		IDW TO	DTAL: 6,20	gal	_		
METER	MODEL No	.: YSI 556 M	MPS			U III			
CHECKE	ED FLOW T	HROUGH CI	ELL FOR LI	EAKS: 🕅 C	OMMENTS:	J/A			
	-			,		-			
		NAME		5	<u>SIGNATURE</u>			DATE	
PREPAR	RED: J	onathan He	rmanson	Ĵ.	Ann Hum	som	7-1-	-19	
REVIEW			<u>-</u>	/		*			
	с				.			t	

WELL NUMBER

MW BUT

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1325	3.40	360	7.14	15.78	0.795	10.2	-94.2	6.00	9.80
1330	3.30	300	714	15.74	0.799	9.58	-94.9	0;00	9,00
1335	4,20	700	7.14	15.31	0.808	9.17	-93.4	0.00	9:30
1340	1.60	300	7.14	15.30	0.813	8.21	-013,4	0.00	4.35
1745	5.00	300	7.00	15.30	6.818	7.01	-93.5	0.00	9.20
1350	6,40	300	7.14	15,90	0.822	6.31	~93.7	0.00	9.20
1355	5.90	300	7.00	15.83	0.925	5.13	-93.9	0.00	9.30
1400	6.20	300	7.14	15.65	0.826	4.69	-94.4	0.00	9.30
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COMMENTS

		-	FIELD G	ROUND-WA	TER SAMPL	ING REPO	ORT		
DATE: _	7.3-19	SITE:	Nearr	nan - CCR	PID READING	6 at WELL HE	EAD (ppm):		,
PROJEC		R: <u>88777</u>	V	VEATHER:	743, 5 mp	,hsw, e	londy		
WELL NU					·		_		
[7	D.	EPTH TO WAT	ER (ft):	.62		
M	w~ 10]). A160			. 7	
PURGING	G		10	TAL DEPTH (II): <u>Mapinp</u>	VVELL DIAN.	IETER (Inche	əs):	
CASING '	VOLUME ()N:fI	of water X in casing	galions/ = foot	total gallor	ns/casing vo	lume	
Equipmer	nt Used: D	edicated Blad	d <u>er Pump</u>	≕N ondedicate	d Bladder Pump	o Bailer (Other		_
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0925	(9ais) J	300	7.03	5.81	0.762	76.2	27.1	6.85	4.62
0930	0.40	301	3.04	14.38	0.596	21.3	29.3	5.23	4.84
0975	0.80	300	7.11	14.25	0.596	9.41	19.9	4.86	4.84
09.40	1.20	700	7.15	14.19	0.596	7.21	[9,]	4.80	4.84
6945	1.60	700	7.15	14.12	0.596	8.27	17.5	4.71	4.84
9950	2.00	300	7,15	1-1.00	0.596	6.40	14,7	4.57	4.84
0455	2.40	300	7.16	14,00	0.5%6	6.87	11.3	4.55	4.84
1000	2.80	300	7.20	(4.00	0-398	7.97	14.5	4.67	9_99
l			C	ntinued on bac	ck (circle one) y	ves (nd	<u> </u>	. <u> </u>	
SAMPLIN	<u>1G</u>	Equipme		Same as above				<u></u>	
Sample Time	Tota Purge		Temp	Conductivity		ORP	D.O.	Depth to Water	Obs.
(24 hr)	(gals)	(C)	(mmhos/cm)	, ,	(mV)	(mg/L)	(ft TOC)	
1025	2.30	7.20	(4.00	0.598	7.97	14.5	4.67-	4.84	
SAMPLE	ID: MW	VATER (ft TO - 18 16 - 18 - 18 - 18 - 18 - 18 - 18 -	1	SAMPLE I	TIME FINAL DE D FOR QC: x III & IV Para		N: 1005	· <u>····</u> ·······························	· · · · · · · · · · · · · · · · · · ·
PARAME								£.,	
		and by				-0			
FERROU	IS IRON (m MODEL No	ng/L): YSI 556 M							
FERROU METER N	MODEL No	YSI 556 M	APS	EAKS: 🏝 CC	DMMENTS;	NA			
FERROU METER N	MODEL No D FLOW T	YSI 556 M	<u>APS</u> ELL FOR L	ľ	DMMENTS: GNATURE	- •	<u> </u>	DATE 3-19	

		-	FIELD G	ROUND-WA	TER SAMPL	ING REPO	DRT	· .	
DATE:	7-2-19	SITE:	Nearn	1an - CCR	PID READING	at WELL HE	AD (ppm): _		
		R:88777	N	/EATHER: _	03, 5-10 mp1	w, clen	s shy		- u
WELL NU	JMBER			D	EP T H TO WATE	ER (ft): 니, 역	50		
٨٨	102-5		φ _e						- *>
		. <u>6</u>		Ç. FAL DEPTH (ft	Mparpart of	NELL DIAM	ETER (inche	s): <u> </u>	
PURGIN	a ta D F 1, a	.0 1946 1.0 C.14			98.3 5.4			a: 3€ 3≝ 25	
CASING	VOLUME	ALCULATIO	N;ft;	of water X 🤙	gallons/ =	total gallo	s/çasing volu	ime	
ాి.	iue <u>7</u> ₩-1	· · · · · ·	<u>et</u>	(1.0) 💡	🎗 🍦 🖓 🔥			st 🤹 🖓	
Equipme	nt Used: D	edicated Blad	ider Pump	Nondedicate	d Bladder Pump	Baller C)ther		
Time (24 hr)	Amount Purged	Flow Rate (ml/min)	pH .	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. / (mg/L)	vvater
	(gals)				. ,	47.5	-751		(ft TOC)
105	L D.26	200	7.12	18.23	0.633	57.3	- 80.1	1.71 0.85	4.50
110	0.93	200	7.05	17.39	0-658	48,2	-81.4	0.51	4.50
120	0.60	200	7.02	17.21	6.664	51.8	- 82.6	0.45	4.50
1123	1.06	200	6.98	7.21	0.668	31.0	-84.8	0.41	4.50
1130	1.33	200	6.96	17.27	0.672	29.2	-84.2	0.45	4.50
1135	1.60	200	6.94	17.18	0.677	267	- 84.2	6.36	4,50
1140	1.86	200	6.91	17.23	0.683	20.0	-83.2	0.28	4.50 4.50
1145	6.15	200	6.90 Co	المكاد الجالية ورائي ومحاد برا	0.688 ∞k (circle one) 4	16.7- Eos/no	00	*.35	ס∡יד
SAMPLIN	<u>IG</u>	Equipme	nt Used: 🗧	ame as above	> Other		<u></u>		J
Sample	Total		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to	<u></u>
Time (24 hr)	Purge (gals)	(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.
1220	3.46	6.79	(7.2)	0.698	11.12	-69.5	0.19	4.50	
FINAL DE		ATER (ft to	C):	0	TIME FINAL DE	PTH TAKEN	l:	5	
SAMPLE	1D: M	w-13/6~0	1	SAMPLE I	D FOR QC:	a second s			
PARAME	TERS REC	UESTED FO	R ANALYS	SIS: <u>Appendi</u>	x III & IV Para	meters		···	
					TAL: 3.96				
METER	MODEL No.	YSI 556 N	1PS			-			
CHECKE	D FLOW T	HROUGH CE	LL FOR LE	EAKS: 🔣 CO	DMMENTS:	71A			
				r					-
		NA <u>ME</u>		SI	<u>GNATURE</u>			DATE	
PREPAR	_{ΈD} , J	onathan Hei	manson	A 1	n Umon		دوي .	7-2.19	
					M				,
REVIEW	ни:				<u> </u>	·····			·····,

WELL NUMBER

MN.13

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Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1150	2.40	200	6.38	12.20	2.694	14.2	-30.4	6.18	· 4.50
1155	2.66	200	6.86	17.20	0.696	11.7	-97.7	0.27	4.50
1200	2.93	200	6.84	7.72	0.697	11.17	-74.2	0.32	4.50
1205	3.20	Zoo	6.81	17.20	0.698	11.01	- 72.0	0.25	4.50
1210	3.46	200	6.79	17.21	D.698	11.12	-69.5	0.19	4.50
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			<u> </u>	1	1				23 (P) (C)
		1999 - 1999 - 1999 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 - 1999 -	d					<u>) 5 3.5</u> .	30
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				<u>م</u>		(.			**************************************
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	42	2-4 (⁴)	1		56.95 % :	Part 15.	P 24	2.2	5. Ç
l				· · ·			h	·····	

<u>COMMENTS</u>

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			FIELD G	ROUND-WA	TER SAMPL	ING REPO	ORT		
DATE:	7-1-19	SITE:	Nearn	nan - CCR	PID READING	at WELL HE	AD (ppm); _		- 54 - 492, 175, 1972, 477
PROJEC	T NUMBEI	R: 88777	V	/EATHER:	<u>39-, ~~~;</u>	nd, cle	alsty		
WELL N				,	<i></i>		ر		
		<u> </u>	1	D	EPTH TO WATE	ER (ft): <u>]3</u>	.45		
Ē	mini	५						0	
PURGIN	<u>IG</u>		то.	TAL DEPTH (fi): <u>Nm-pp</u>	Well Diam	ETER (inche	s): <u> </u>	
CASING		CALCULATIC)N: ft	of water X in casing	gallons/	total gallor	is/casing vol	ume	
Equipme	ent Used: D	edicated Blad	dder Punip	Nondedicate	d Bladder Pump) Bailer C	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)
NG60	1	300	7.003	11.78	0.682	1064	-8.0	2.28	13:45
0955	6.46	300	7.02	1127	0.679	613	-11.2	2.17	13.45
1000	0.80	300	6.98	10.99	0.689	53.6	72.8	1.72	13.45
065	1.30	300	6.98	10.95	0.692	36.5	57.6	1.50	13.45
1010	1.60	300	6.98	10.88	0.642	32:5	-10.2	1,70	13.45
1015	2.00	300	6.99	10 76	0.642	25.8	-14.9	1.79	13.45
1020	2.40	300	6.95	10.77	0.692 0.693	4.26	-4,4	1.72	13.45
	04.1 %		Q			-1.00	<u> / </u>		
·		<u> </u>	Co	ntinued on ba	ck (circle one) y	es (nd)	l	1	1
<u>SAMPLI</u>	NG	Equipme	nt Used: S	ame as above	e Other			·	
Sample Time (24 hr)	Purge	ed pH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1030	,	<u> </u>	1077	0.693	4.26	-4.4	1.72	13.45	
FINAL D	ΕΡΤΗ ΤΟ Ν	VATER (ft TC	1C): <u>13.4</u>	5	Time final de	EPTH TAKEN	1: <u>10</u>	30	_
SAMPLE	E ID:	N-1416~	<u></u>	SAMPLE	ID FOR QC:				
PARAMI	ETERS REG	QUESTED FO	DR ANALYS	SIS: Appendi	x III & IV Para	meters	<u></u>		
FERROL	US IRON (n	ng/L.):		IDW TO	TAL: <u>2. 9</u> 0	2			
METER	MODEL No	<u>YSI 556 N</u>	MPS			0			
				FAKS: (xr) CC	OMMENTS:	MA			
\$1.207(L						· , ,:= . v	· · · · · · · · · · · · · · · · · · ·		
		5.1 A 8. Jan		~				- K	
	т	<u>NAME</u>		. 0	<u>GNATURE</u>			DATE	
PREPAF	RED: J	onathan Hei			Um Hamm	<u>~</u>		1-19	
REVIEW	/ED:	<u> </u>		<u>/</u>					,

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			FIELD G	ROUND-W/	ATER SAMPL	ING REPO	DRT	.:.	
DATE:	7-1-19		: Nearn	nan - CCR	PID READING	at WELL HE	:AD (ppm): _		<u>, , , , , , , , , , , , , , , , , , , </u>
PROJEC	TNUMBER	R: 88777	V	VEATHER:	405, No in	which ()	lens-sle	-}	
WELL N									
F				Ď	EPTH TO WATI	ER (ft): <u> </u>	e->		
<u>M</u> 1	N-15			TAL DEPTH (f	t): <u>Nm-p-p</u>		ETER (inche	st 2	
PURGIN	G				0. ionsparte			· · ·	-
CASING	VOLUME		ON:ft	of water X in casing	gallons/ = foot	total gallor	is/casing volu	lme	
Equipme	nt Used: 6	edicated Bl	adder Pump	> Nondedicate	ed Bladder Pump	Bailer C	ther	.	_
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1750	I	200	7.64	12.32	0.659	16.7	-66.3	1.47	9.65
1155	<u>6.40</u>	<u> </u>	758	10.98	0.680	13.8	-72.9	033	9.65
1900	0.20	300	7.55	10.72	0-678 m (76	10.14	-76.7	0.55	9.65
1205	1.60	300 300	7.54	10.75	0-676	7.31	-79.0	0,50	7.65
······									Ì
					-				
- <u>-</u>			Co	i ontinued on ba	ck (circle one) y	les no	<u> </u>		,
SAMPLIN	<u>IG</u>	Equipm	ent Used:	Same as above	Other				
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		.ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1215	1,6.0	7.5	5 10.85	0.676	9.11	-79.0	0.59	9.65	
FINAL DI	ЕРТН ТО И	VATER (ft T	0C): <u>9.6</u>	5	TIME FINAL DE	EPTH TAKEN	1215		
SAMPLE	ID: Mn	J-15/6~	0)	SAMPLE	ID FOR QC:				
PARAME	TERS REC	QUESTED F	OR ANALYS	SIS: Appendi	ix III & IV Para	meters			
FERROU	IS IRON (m	Ig/L):	,	IDW TO	TAL: 1.60	yay_			
METER N	MODEL No	YSI 556	MPS			9			
				EAKS: 🛃 C	OMMENTS:	JA	<u></u>		
				1 *					
		NAME		<u>S</u>	IGNATURE			DATE	•
PREPAR	ED:J	onathan H	ermanson		The Dawn	\sim	7-	1-12	
REVIEW	ED;	4 <i>1</i>							

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			FI	ELD G	ROUND-WA	ATER SAMPL	ING REPO	ORT	· .	
DATE: 🛥	5-1-19		ТЕ:	Nearn	ian - CCR	PID READING	at WELL HE	:AD (ppm); _	тур, андар <u>урад а</u> йбалуунд түр. — — 	
	-		7	W	EATHER:	? 5	chengs	<u>,</u>		
WELL NU										
F		'	——ı		D	EPTH TO WAT	ER (ft):	70		
M	J-16					7 04 -			2	
URGIN	·			ТОТ	fal depth (f	t): <u>32.45</u>	WELL DIAM	ETER (inche	s):	 .
	_	CALCULA	TION:	ft	of water X in casing	gallons/ = foot	total gallor	ns/casing volu	ume	
quipme	nt Used: Q	edicated	Bladde	r Pump	-	ed Bladder Pump	o Bailer (Other		_
Time (24 hr)	Amount Purged (gals)	Flow Ra (ml/mir		рH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC
79-20		200	(53	16.04	1.4/8	6.04	-65.0	1.59	470
2825		300		s.59		1.203	411	-78.6	3.10	4.70
~~;o	0.80	300	6	SU	15.32	1.288	3.18	-84.9	8.94	4,70
835	1.20	300		57	15.17	1.275	3.43	-93.1	8.03	4.70
१५०	1.60	300	6	(< 7	1517	1.073	3.39	-97.4	1.20	<u> </u>
BUS	2.00	320	_6	,58	15,13	1,272	3.18	-99,2	1	4.70
850	Cuo	300	6	, .5B	15.05	1,270	2.91	-99,7	1	4.70
855	2.80	300	6	,58	15.08	1.26 5	2.72	-100.2	0.32	4.70
				Co	ntinued on ba	ck (circle one) y	/es / 🕰	<u> </u>	<u> </u>	
AMPLIN	<u>1G</u>	Equip	oment I	Jsed:	ame as above	ð Other				
Sample Time (24 hr)	Tota Purge (gals	ed p	H	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
7900	2.30		58	15.08	1.265	2.72	-100.2	0.32	4.70	
	EPTH TO V			4,9	00	TIME FINAL DI	EPTH TAKEN	1: <u> </u>	<u>0</u>	
AMPLE	1D: <u>M</u> ~	-16 6-	v01			ID FOR QC:				
PARAME	TERS REC	QUESTEE	FOR	ANALYS	SIS:	ix III & IV Para	imeters			
						TAL: 2.80				
NETER I	MODEL No	YSI 58	56 MP	S			0			
					EAKS: 🎢 CO	OMMENTS: N	IA			
	-	<u>NAM</u>			$1+\frac{s}{s}$	IGNATURE			DATE	
REPAR	:ED:	onathan	Herm	anson	Inter	u Vusino	<u></u>		1-19	
REVIEW	ED:				<i>v</i>			<u>.</u>		

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July 1,2019 _ 88737 _ J. Hormono 3-1-19 88777 J. Hermeal 1050: Set up & MW-15, cannot lounde well wy, Sus ! ((A GW MONITORING Proconnell Jonathan 16 connorson look & previses countries, Still connet coost it. Weather: 305-905, 0-5 mph 300, partly cloredy_ longent promon where to use there was 11 40' Acress well here OBUS: Getice 1150: Begin purging MW-15 0710' accine on's ite & cleck in w/ good 07151 Bayin site recor to Lehomine fewerbilly to 1215: Collect mw-15/6word to: Apr. # +22 1235: Set up @ mm- 8A lo/wis/ collect sumple bon mer-10, 1240 : Begin surging MEN-BA Will monite water Ren & Dryg wenty still floored 405 Colled mar. 80 6 Wor 1ms 1ms of Fix Paper D + TV to real top of casing @ Mu-10, it where is SI: H high @ endor day bomanow 7.2.19 1450 Set up @ now-20 waders mill be used to collect simple 2 we 1500. Beg in priging MW-21 1525; Collect Dup=1/6morth Munar 16mort 0718: CMW-16 to instal dellated D'aill' pump Appendity of + ID painvalues & to set he 0755: TD: 32.45 10'secon, Dedinate bludder grimp 1555: Sch up @ mw-3 1610 Begin purying MW-3 - p Eet @ 28.15' 12+02 6300: callidide equipment 1645: Collect June 3/6mos) 1655: Clam y officer on site + asyntach pl1: 4.00/4 7.00/7 10.00/10 tub: 0.84/0 9.92/10 to morrow 1700: Offersite 102: 1. 400 lingog 02P. 237.5 Intern Herry Do. 100.090 0820: Begin purging - MW-18 : (allect M.w. Up/ 6wei) Rei UR App. TI & TU 0000 At MA- 14 to set we €£ 90 0950 : Birth Burghon min-141 1030: Colled MIN-14 [GNO] for CLA Ape-TI-+ ID

July 2,2019 38777 J.Kummoon 88777 J.H. man ... 7-2-19 at muilo, BPA will develop well this munity The K: CLR GN Monitoring hentur: 700-905, 0-10 mph 4, claisky 50 nd lan collect sample to morrow, 7-3,79, had " will be nown, sately contracted be determine. I Ressonal! Jonathan kummer 0645: Get ice all salet requirements met 0710: 00-574 & check in al gound 1035: A6 MW-13 to Ed up -0720: At MV-19 to sur up & callisinna 109: Bagli projing MAN-13 pump, resampling scenne missatomation think 1220: Willect For 13/6000 tor App. III + IV pasanology Monitoring nell hand been developed, well developed man on to Kotis project to supply munit by WBPh atter sampling on 7-1-19. - 11. 4.00/4 7.0017 4.4A/10 6n: 1.400/1.400 Twb: 0.8410 a.a41,0 02P: 2325 00: 100-070 0745. Jegin proging MW-14 0810 Collect Tone-14/6mon Er All. II + IV 0825: At MW-10 to collect [FISOD water 1] for App. TIL + TO prenentes of white poder wound monitory ------l OBSO! AL MUN.Y to sit up 0905: Bayn prighy MM-4 0920 Collect par gol Flooductuz For App II 1 TD presenters for mouth north of Mon -4. 1945; Collect MW-4(6mor) + (10000-2(6mor) bol Aquality II + TO prinades When entry: 0925: Le. Brown on-ride, discuss doulgrand

 $\sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{j=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{i=1}^{n} \sum_{i$

104100 July 3, 2014 88773 J. tammen Tak: GLR Goomewall monitoring pushes: 703-803, 5-10 mph swy partly clary Personel Jonathin Kirning 0800: Get ice 0825: Acome on - site 0830: At mum 10 to set yo & callidrand quipme ph: 4.00/4 2.00/7 100/10 - (wn: 1.404 /1,409 _____ Tuib: 201, 10.3%,0 ORP: 237.5 00: 100.070 0855 " Tyles, BPM, conside to help al she of drongers 0925 · Begin paying MW-10 1005 · Colled MM-rol GNOZ & Appresso TH & TR 1030 : (lean up, clean and well gourd, att -site to trap sumples ott totu ligo

203	. 1	199 7 (2019)	1.180	2012502 (SOL

FIELD GROUND-WATER SAMPLING REPORT

DATE: <u>II-26-19</u> SITE: <u>KCBPU-Nearman</u> PID READING at WELL HEAD (ppm); PROJECT NUMBER: <u>88777</u> WEATHER: <u>40s</u> <u>smph</u> <u>15e</u> , <u>everceast</u> WELL NUMBER DEPTH TO WATER (ft): <u>12.56</u> <u>MW-2A</u> <u>PURGING</u> CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot
WELL NUMBER DEPTH TO WATER (ft): 12.56 $Mw-2A$ TOTAL DEPTH (ft): 31.72 WELL DIAMETER (inches): 2 PURGING TOTAL DEPTH (ft): 1.72 WELL DIAMETER (inches): 2 CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot
DEPTH TO WATER (ff): $[2.5 G]$ MW-2A TOTAL DEPTH (ft): 31.72 WELL DIAMETER (inches): 2 PURGING TOTAL DEPTH (ft): 31.72 WELL DIAMETER (inches): 2 CASING VOLUME CALCULATION: ft of water Xgallons/ =total gallons/casing volume in casing foot
TOTAL DEPTH (ft): >1.7 PURGING Q CASING VOLUME CALCULATION: ft of water Xgallons/ =total gallons/casing volume in casing
PURGING CASING VOLUME CALCULATION: ft of water Xgallons/ =total gallons/casing volume in casing foot
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot
Equipment Used: Sedicated Bladder Pump Nondedicated Bladder Pump Bailer Other
Time (24 hr)Amount Purged (gals)Flow Rate (ml/min)pHTemp (C)Conductivity (mmhos/cm)Turbidity (NTUs)ORP (mV)D.O. (mV)Depth to Water (ft TOC)
1300 7 300 7.00 13.66 0.741 18.1 20.0 308 12.56
1805 0.40 300 7.03 13.69 0.743 9.40 15.9 1.79 12.56
1310 0.30 300 7.01 13.65 0.743 5.21 13.2 1.32 1256
1315 1.20 300 7.00 13.63 0.741 3.89 6.2 1.00 12.56
1320 1.60 300 7.00 13.63 0.741 3.01 1.7 0.62 12.56
1325 2.00 300 7.00 13.60 0.739 2.24 -1.4 0.56 12.52
1330 240 300 7.01 13.60 0.739 1.96 -4.2 0.52 12.56
Continued on back (circle one) yes / 6
SAMPLING Equipment Used: Same as above Other
SampleTotal PurgedTemp pHConductivity (C)Turbidity (mmhos/cm)ORP (mUs)D.O. (mV)Depth to Water (mg/L)Depth to Water (ft TOC)
1336 2.40 7.01 13.60 0.739 1.96 -4.2 0.52 12.56 -
FINAL DEPTH TO WATER (ft TOC): 12.56 TIME FINAL DEPTH TAKEN: 1335 SAMPLE ID: MW-2A/6W02 SAMPLE ID FOR QC: THE Dap-V6W02
PARAMETERS REQUESTED FOR ANALYSIS: Appendix III & select Appendix IV
FERROUS IRON (mg/L): IDW TOTAL:
METER MODEL No.: YSI MPS 556
CHECKED FLOW THROUGH CELL FOR LEAKS: COMMENTS: NA
NAME <u>SIGNATURE</u> DATE
PREPARED: Jonathan Hermanson Although Manager 11-26-19
REVIEWED:

i di ka

FIELD	GROUND-WATER SAMPLING RE	PORT
FIELD	GROUND-WATER SAMPLING RE	PORT

7771.2% 1.1

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			RCDDI	Noomaa	<u></u>	yan eka kara ara		, i Mercus Arrestation y	a tag parang an t
			•		PID READING			•	
PROJEC	T NUMBER	R: <u>88777</u>	W	/Eather:	125, Smph,	E, overen	s+	. <u>.</u>	
WELL N				, Ď	EPTH TO WAT	ER (ff):) 4	.82		
M	lw-3				7451			_	
PURGIN	G		TO	TAL DEPTH (f	t): <u>39,57</u>	WELL DIAM	ETER (inche	s):	-
:	— .	CALCULATIC	N:ft	of water X in casing	gallons/ = foot	total gallon	is/casing vol	ume	
Equipme	nt Used: 🛛 🖗	edicated Blac	lder Pupp	•	ed Bladder Pump	Bailer . C)ther		-
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
1400	Ţ	300	6.87	14.12	0.909	R 28	26.4	5-83	14.83
1405	0.40	300	6.78	14.34	006	5.28	25.8	2.51	¥.85
Mio	0.80	300	6.75	14,50	1.024	3.00	27.2	1.35	14.85
1915	1.20	300	6.75	14.53	1.026	2.71	27.8	0.95	14.95
1420	1.60	300	6.75		1.026	2.44	28.1	0.66	14.85
1425	2.00	300	6.74	14.55	1.028	2.30	23.Z	0.53	19.85
1430	2.40	300	6.74	14.65	1.028	2.14	28.1	6.46	14.85
······		<u>.</u>			•		· • ·· • · •		
			Cc	ntinued on ba	ck (circle one) y				
SAMPLI	<u>NG</u>	Equipme	nt Used: S	ame as apove	e Other			~ 	
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)	-	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1435	2.40	6.74	14.55	1.028	214	28.1	0.46	14.85	-
		VATER (ft TO <u>アース (らいの</u>			TIME FINAL DE		: <u>143</u> .	5	
				SIS: Appendi	x III & select A	ppendix IV			
		-			TAL: 2.40				
		YSI MPS		1011 10		-Q			·
				AKS 1121 CO	OMMENTS:)(A			
		HINDOGHUE				· · · · · ·		<u> </u>	
				_				·	
	Tana	<u>NAME</u> than Horma	2602	<u>S</u>	IGNATURE			<u>DATE</u>	
PREPAR	RED: Jona	than Herma	nson 		m Heim	19 75-		26-19	·,
REVIEW	'ED:		·	· ,,,,,,,	I	·			

									keren (n. 1995) N
			FIELD G	ROUND-WA	TER SAMPL	ING REPC	RT		
DATE:	11:26-19	SITE	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):		
					(05, 5 mph	NE, 0	weast		
WELL N									
[Þ	EPTH TO WAT	ER (ft): <u>1/ •</u>	<u>40</u>		
MI	N-4				t): 31.98	WELL DIAM	ETER (inche	a). 2	
<u>PURGIN</u>	G				·/·			· ·) ·	
CASING	VOLUME (CALCULATIC	DN: ft	of water X in casing	gallons/ ⊨ foot	total galion	s/casing vol	ume	
Equipme	nt Used: D	edicated Bla	dder Pump	•	d Bladder Pump	o Bailer O	ther		
Time	Amount	Flow Rate		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water
(24 hr)	Purged (gals)	(ml/min)	pH	(C)	(mmhos/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)
1450	L	300	6.78	14,50	1.011	1.62	37.3	3.13	11.40
1455	0.40	300	6.77	14.70	1.034	1.66	39:4	1.51	11.40
<u>1560</u> 1505	0.80	300	6.87	14.79	0.826	1.46	37.4 36.8	1.75	11.40
1505	1.60	300	6.89 6.89	14.81	<u>0,803</u> 0,801	1.22	36.8	1.82	11.40
1515	2.00	300	6.90	14.90	0.496	0.51	36.7	1.65	11.40
<u> </u>									
				ntiqued on her	ck (circle one) y				
·									
<u>SAMPLII</u>	<u>NG</u>	Equipme	nt Used: 💡	amé as above	e Other		·		
Sample			Temp	Conductivity	Turbidity	.ORP	D.O.	Depth to	
Time (24 hr)	Purge (gals		(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.
150	2.00		14.90	0.796	0.51	36.7	1.65	11.40	
FINAL D		VATER (ft TC	С): н.ч	0	TIME FINAL DE	PTH TAKEN	152	0	
		V-4/600	· · ·				· <u> </u>		
							· · · · · · · · · · · · · · · · · · ·	,	· · · · · · · · · · · · · · · · · · ·
					x III & select A		· · · · ·		
FERROL	JS IRON (m	ıg/L):		IDW TO	TAL: 20	<u>901</u>			
METER	MODEL No	.: YSI MPS	556		``	~			
CHECKE	ËD FLOW T	HROUGH CI	ELL FOR L	EAKS: 🕅 CO	OMMENTS: /	J(A			
		NAME		SI	GNATURE			DATE	
PREPAR	RED: Jona	than Herma	nson	.a á	Im Num	•	4.	26-19	
									·
REVIEW	ыр. <u> </u>		· · · ·						

							DRT		
DATE: <u>I</u>	10-26-19	SITE:	KCBPU	- Nearman	PID READING	G at WELL HE	AD (ppm):		
PROJEC	T NUMBE	R: <u>88777</u>	v	VEATHER: _	405, 15 mph	E, Over	as <u>+ / / / / / / / / / / / / / / / / / / </u>		
WELL N									
1				Ĺ	DEPTH TO WAT	ER (ft):	.07		
m	W-87	<u>. </u>			75 27			.7	
PURGIN	G		ТО	TAL DEPTH (ft): <u>35,27</u>	WELL DIAM	ETER (inche	s):	
		CALCULATIC)N:f	t of water X in casing	gallons/ = foot	total gallor	ns/casing vol	ume	
Equipme	nt Used: D	edicated Blac	ider Pump	Nondedicat	ed Bladder Pum	o Bailer (Other	· · · · · · · · · · · · · · · · · · ·	_
Time	Amount	Flow Rate		Temp	Conductivity	Turbidity	ORP	D.O.	Depth to
(24 hr)	Purged (gals)	(ml/min)	рН	(C)	(mmhos/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)
1030	(gaio) I	300	6.96	14.81	1.105	28.2	-39.6	5.32	16.07
1035	0.40	300	7.04	14.94	0.5.1	19.3	-90.5	2.13	(6.33
040	0.90	300		14.95	1.208	14.6	-99.6	1.36	16.13
645	1.20	300		15,00	1,199	13.5	-104.5	1.05	16.13
050	1.60	300	7.67	14.97	1.191	12.81	-107.2	0.91	16.13
1055	7.00	300	7,07	14.94	1.184	11.58	-101.6	6.72	16.13
(100	2.40	300	Fa. F	14.93	1,(82	10.70	- 112.0	0.62	16.13
1105	2.80	300		14.96	1.177	11.03	9-111-9	0.58	16.13
1110	3.20	300	7.07	14.94	(, 174	9.57	-112	0.52	16.13
		—	C	ontinued on ba	ack (circle one)	/e͡€) / no			
SAMPLIN	<u>NG</u>	Equipme	nt Used:	Same as abov	e _Other			<u></u>	
Sample	Tota					<u> </u>		Depth to	يەرە <u>س</u>
Time	Purg€	ed pH	Temp (C)	Conductivity (mmhos/cm		ORP (mV)	D.O. (mg/L)	Water	Obs.
<u>(24 hr)</u>	(gals	;) 7.07	14.96					(ft TOC)	
1125	4,00	7.07	14.90	1.167	10.44	-111, 9	0.45	16.13	<u> </u>
FINAL D	ЕРТН ТО V	VATER (ft_TO	C): <u>16</u> ,		TIME FINAL DI				<u></u>
SAMPLE	ID: Mh	1-89/6w	202	SAMPLE	ID FOR QC:	MIN-RA	ms & n	NW-87 La	102 map
				Append	ix III & select A	ppendix IV			
PARAME	LIERS REC	QUESTED FC	R ANALY	219: 11-214	(1			· · · · · · · · ·	
				IDW TO	DTAL: 4.00				
METER I	MODEL No	YSI MPS	556						
				Eaks: 🕅 🖸	OMMENTS:	SIA			
					,	- I			
				-					
	Tam-	<u>NAME</u> than Herma	ncon	<u>2</u> t e	<u>IGNATURE</u>			<u>DATE</u>	
PREPAR	ED: Jona	ithan Herma	nson		n Human		<u> </u>	26-19	· .
				v					

WELL NUMBER

MW-8A

Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O, (mg/L)	Depth to Water (ft TOC)
1115	3.60	300	7.08	14.96	1.169	8.06	-109.8	0.48	16.13
420	4.00	300	7.07	14.96	1.167	10.84	-111.9	0.45	76.03
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COMMENTS

		-	FIELD G	ROUND-WA	TER SAMPL	ING REPO	DRT		
DATE: _a	11-26-19	SITE:	KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):		
PROJECT NUMBER: 88777 WEATHER: UOS, Smph E, ownerst									
WELL N					``	· .			
[DEPTH TO WATER (ft): 16.56								
W	MW-10 7010								
PURGIN	TOTAL DEPTH (ft): 29.63 WELL DIAMETER (inches): 2								_
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume									
				in casing	foot				
Equipme	nt Used: _D	edicated Blac	lder Pump	Nondedicate	d Bladder Pump	Bailer C	other		-
Time	Amount Purged	Flow Rate	pН	Temp	Conductivity	Turbidity	ORP	D.O.	Depth to Water
(24 hr)	(gals)	(ml/min)		(C)	(mmhos/cm)	(NTUs)	(mV)	(mg/L)	(ft TOC)
1200	Ţ	300	6.75	14.88	0.9.70	15.2	5.6	7.52	10.56
1205	0.40	300	6.73	15.47	1.257	5.39	9.0	2.61	10.59
1210	0.80	300	6.73	15.49	1.274	2.33	16.4	1.61	16.59
NIS	1.20	300	6.73	15.48	1.276	1.52	12.4	1.11	10.59
1220	1.60	300	6.73	15.42	1.275	1.39	13.0	0.95	10.59
1225	2.00	300	6.74	15.42	1.274	1.17	13,4	0,78	10.59
1230	2.40	300	6.74	15.41	1.274	1.05	13.6	0.71	70-59 1050
1235	2.80	300	<u>(</u> .7.4	15.43	273	3.11	1.01	0.59	10.59
<u></u>		<u> </u>	LCo	ntinued on bac	ck (circle one) y	es /(ñð)			±
<u>SAMPLIN</u>	NG	Equipme	nt Used: S	ame as above	Other		(P, (a		<u></u>
Sample	Tota		Temp	Conductivity	Turbidity	.ORP	D,O.	Depth to	
Time (24 hr)	Purge (gals		(C)	(mmhos/cm)		(mV)	(mg/L)	Water (ft TOC)	Obs.
1240	2.8		1593	1.273	3.11	140	0.59	10.59	-
FINAL DEPTH TO WATER (ft TOC): Io.s.a TIME FINAL DEPTH TAKEN: Io.40 SAMPLE ID: MW~10 SAMPLE ID FOR QC: Io.2000									
PARAMETERS REQUESTED FOR ANALYSIS: Appendix III & select Appendix IV									
PARANIE	LIERS REU		-	NO. <u>11</u>	2 90				
FERROL	JS IRON (m	ig/L):		IDW TO	TAL: 2.80	gai	_		
METER I	MODEL No	.:YSI MPS :							
CHECKE	D FLOW T	HROUGH CE	ELL FOR LE	eaks: 🏹 CC	DMMENTS: 🔥	IA			
		NAME	·	SI	<u>GNATURE</u>			DATE	
	Jona	than Herma	nson		~ Hannom		(1-26		
PREPAR	ED:	· •=///	· · · • • • • •		- Longaguer				
REVIEW	REVIEWED:								·

		_	FIELD G	ROUND-W	ATER SAMPL	ING REPO	DRT		
DATE: _	1-26-19		KCBPU	- Nearman	PID READING	at WELL HE	AD (ppm):		
PROJECT NUMBER: WEATHER: Hos, U mph NE, pusty (lows)									
WELL N					EPTH TO WAT	,	<u> </u>		
MW-13 TOTAL DEPTH (ft): 33.97 WELL DIAMETER (inches): 2									
PURGING									
				in casing					
Equipme	ent Used: D	edicated Bla	ader-Pump	Nondedicate	ed 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)
0725	I	150	6.38	14.10	0.846	12.48	45.3	4.75	10.78
0730	0.20	150	6.59	14.30	0.900	11.32	-8.0	3.78	(0.78
0735	040	150	6.86	14.42	6.911	9.39	-66.3	2.53	(0.78
6740	0.60	150	6.45	14.35	0.914	5.65	-39.9_	2,32	10.78
0745	0.80	150	6.97	1935	5.916	61.84	-95.0	2.13	19.78
0750	1,00	150	6.98	14.37	0.917	4.07	-97.1	1.98	10.78
0755	1.20	150	6.99	14.31	0.9.9	3.41	- 93.9	1.73	10.78
0800	1-40	(50	7.00	14.21	<u>0913</u>	2.56	- 99.9	1.53	(2.78
0805	1.60	180	1.00 Co			2 -15 ⊯e§/no	-94.8	1.35	10,78
Continued on back (circle one) vertical / no SAMPLING Equipment Used: Same as above								<u> </u>	
Sample Time (24 hr)	e Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
0820	2.00	7.01	14.26	0-916	1.34	-99.2	1.20	10.78	`
SAMPLE PARAMI	EID: <u>Mw</u> ETERS REC	VATER (ft TC <u>-13) 6000 e</u> QUESTED FC	DR ANALYS	SAMPLE SIS: <u>Appendi</u>	TIME FINAL DE ID FOR QC: ix III & select A	ppendix IV	· · · · · · · · · · · · · · · · · · ·		
FERROL	JS IRON (m	ng/L):		IDW TC	DTAL: 7.0	gnl			
		.: YSI MPS							
CHECKE	ệd flow t	HROUGH CI	ELL FOR LI	EAKS: 🕅 C	OMMENTS: <u>. U</u>	Ά			
		NAME		, <u>s</u>	IGNATURE			DATE	:
PREPAF	RED: Jona	than Herma	unson		moltom		11-7	26-19	-
-									
		-							

WELL NUMBER

2:1/. Truit.

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Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0810	1.80	(\$0	7.00	14.28	0.917	1.51	-100.1	1.23	10.78
OBIS	2.00	150	2.01	14.26	0.916	1.34	- 99.2	1.70	10.7%
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<u>COMMENTS</u>

FIELD GROUND-WATER SAMPLING REPORT								. · · ·			
DATE:	11-20-19	SITE	KCBPU	- Nearman	PID READING	at WELL HE	EAD (ppm):				
PROJEC		R: <u>88777</u>	v	VEATHER: 4	105, 5 mph N	e oursi	·				
WELL N	UMBER					· · · ·					
<u></u>				DEPTH TO WATER (ft): $17.45$							
LM	W-19_				1. 23.72		IETED (inch	a): 7			
PURGING       TOTAL DEPTH (ft):       33.27       WELL DIAMETER (inches):       Z									_		
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot											
Equipme	nt Used.	edicated Bla	Ider Pump	Nondedicate	ed Bladder Pump	o Bailer (	Other		·		
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	pН	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)		
OBUS		J20	6.61	16.11	0. 331	4.54	11.9	8.69	17.45		
0340	,\$00	300	6.95	17.77	0-842	3.65	7.1	258	17.45		
0965	0.80	300	6.97	17.82	0.844	2.42	8.4	3.74	17.45		
9100	1.20	700	6.93	17.88	0.945	7.03	11.9	(e.5.37.1	16 17.45		
0405	1.60	300	6.94	17.84	0.844	1.68	12.9	1.44	17.45		
0910	2.00	300	6-94	17.86	0.843	1.46	11.6	1.38	17.45		
	<del>_</del>				<del></del>		<b>,</b>		· ·		
	]	1	Co	ontinued on ba	ck (circle one) y	/es / 60	<b>د</b>	4			
<u>ŚAMPLIł</u>	NG	Equipme	nt Used:	Same as above	Other				; <u>, , , , , , , , , , , , , , , , , , ,</u>		
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.		
Gens	2.00		17.96	0.843	1.46	11.6	1.33	17.45	Biatolos i a hasis		
FINAL DEPTH TO WATER (# TOC): 17.4/5 TIME FINAL DEPTH TAKEN: 09/5								homes into the inter-			
SAMPLE ID:       MW-14/600>C       SAMPLE ID FOR QC:											
PARAME	ETERS REC	QUESTED FO	OR ANALYS	SIS: <u>Appendi</u>	x III & select A	ppendix IV			<u></u>		
FERROL	JS IRON (m	ng/L):	 	IDW TO	TAL: 2.0	<u>9a1</u>			· .		
METER I	MODEL No	YSI MPS	556								
CHECKĘ	ED FLOW T	HROUGH CI	ELL FOR LI	EAKS: 🕅 CO	DMMENTS:	<u> </u> A					
		NAME		<u>Si</u>	GNATURE			DATE			
PREPAR	ED: Jona	ithan Herma	nson		m Homon		()-2	6-101			
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·	<u></u>	······································									

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			FIELD G	ROUND-W/	ATER SAMPL	ING REPO	DRT	·	
DATE:	11-26-19	SITE:	KCBPU	- Nearman	PID READING	) at WELL HE	EAD (ppm):		
					102, 10 mgh	NE, OUN	cast .	· .	
DEPTH TO WATER (ft): 15-55									
TOTAL DEPTH (ft): 31.75 WELL DIAMETER (inches): 2									
PURGIN	G		TÒ	TAL DEPTH (f	t): <u>517</u>	well diam	ETER (inche	es):	_
CASING	VOLUME (		)N: ft	of water X in casing	gallons/ = foot	total gallor	ns/casing vol	lume	
Equipme	nt Used: "Đ	edicated Blac	Ider Punp	Nondedicate	ed Bladder Pum	o Bailer (	Other		_
Time (24 hr)	Amount Purged (gals)	Flow Rate (ml/min)	рH	Temp (C)	Conductivity (mmhos/cm)	Turbidity (NTUs)	ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)
0935	I	Joo	7.72	17.16	0.741	5.94	-29.6	6.78	15.55
<b>91</b> 40	5.40	300	7.34	19.59	0-697	esco /	-41.3	1.53	15.55
orus	0.30	300	7.35	19.72	0.696	2-36	-43.5	1.15	15.55
CANO	1.20	300	7.35	19.73	0.696	12.4	-47.7	0.91	15.55
0955	1.60	300	7.34	19.81	0.697	7.98	-50.7-	0.74	15.55
<u> </u>	200	300	7.34	19.84	0.697	1,83	22.8	0.72	15.55
1005	240	300	7.34	19.85	0.697	1.37	-58.7	0.62	15.55
			C	ntinued on ba	ck (circle one)	les / nes			
							مورد سرورد مسمع	*·····	
<u>SAMPLIN</u>	<u>1G</u>	Equipme	nt Used: 🧯	same as above	e Other				
Sample Time (24 hr)	Tota Purge (gals	ed pH	Temp (C)	Conductivity (mmhos/cm)		ORP (mV)	D.O. (mg/L)	Depth to Water (ft TOC)	Obs.
1010	2.40	7.34	19.85	0.697	1.37	-58.7	0.62	15.55	43900000
FINAL DI	FINAL DEPTH TO WATER (ft TOC):       15.55       TIME FINAL DEPTH TAKEN:       10.10								
		<u>-15/6202</u>			ID FOR QC:				
		· · · · · · · · · · · · · · · · · · ·			x III & select A				
FERROL	IS IRON (m	ig/L):	-	IDW TC	TAL: 2.40	<u>qal</u>			
METER	MODEL No	YSI MPS	556					·	
CHECKĘ	D FLOW T	HROUGH CE	ELL FOR LI	EAKS: 🕅 CO	OMMENTS:	U(A			
	Ŧ	<u>NAME</u>	•	4 A	IGNATURE			DATE	
PREPAR	ED: Jona	than Herma	nson	Anthin	1 Human	· · · · · · · · · · · · · · · · · · ·	11-26	·/a	
REVIEW	ED:			/			<u> </u>		

-17.F

DATE: $425-19$ SITE: KCBPU - Nearman PID READING at WELL HEAD (ppm): PROJECT NUMBER: 88777 WEATHER: $5^{\circ}5 \le m_{2}h w$ , $pext is classymptotic starting for the second starting starting for the second starting f$							
PROJECT NUMBER:       88777       WEATHER: $5^{\circ}$ S mp h m, party class,         WELL NUMBER       DEPTH TO WATER (ft): $12 \cdot 22$ MUMA-16       TOTAL DEPTH (ft): $32.64$ WELL DIAMETER (inches): $2$ PURGING       TOTAL DEPTH (ft): $32.64$ WELL DIAMETER (inches): $2$ PURGING       TOTAL DEPTH (ft): $32.64$ WELL DIAMETER (inches): $2$ PURGING       Total DEPTH (ft): $32.64$ WELL DIAMETER (inches): $2$ PURGING       If of water X gallons/ = total gallons/casing volume in casing foot       total gallons/casing volume (md/min) $0$ Equipment Used:       Pedteated Bladder Pump       Nondedicated Bladder Pump       Baller       Other $0$ Time (24 hr)       Purged (ml/min)       pH       Temp (C)       Conductivity (mV) (mV) (mg/L)       Water (ft TOC)         IISS       I $3^{\circ}$ o       S.3 $14.63$ $1.20i$ $7.93$ $63.3$ $2.59$ $12.22$ $200$ $e^{eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee$							
DEPTH TO WATER (ft): $12 \cdot 22$ DEPTH TO WATER (ft): $12 \cdot 22$ MAIN-16         DEPTH TO WATER (ft): $12 \cdot 22$ PURGING         CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot         Equipment Used: Dedicated Bladder Pump       Nondedicated Bladder Pump       Bailer Other							
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TOTAL DEPTH (ft): $32.64$ WELL DIAMETER (inches):PURGINGCASING VOLUME CALCULATION:ft of water Xgalions/ =total gallons/casing volume in casing footEquipment Used: Dedicated Bladder PumpNondedicated Bladder PumpBaller Other							
PURGINGCASING VOLUME CALCULATION:ft of water Xgalions/ =total gallons/casing volume in casing footEquipment Used: Pedicated Bladder Pump Nondedicated Bladder Pump Bailer OtherTime (24 hr)Amount Purged (gals)Flow Rate (ml/min)pHTemp (C)Conductivity (mmhos/cm)Turbidity (NTUS)ORP (mV)D.O. (mg/L)Depth to Water (ft TOC)1/55T3 ° 05.3 314.631.2017.9363.82.5912.221/200.402 ° 014.411.1951.9%74.91.1217.221/200.805001.5-32414.391.9%74.00.8912.221/201.203 ° 06.914.331.1851.4574.60.95412.221/201.203 ° 06.914.331.1851.4574.60.95412.221/202.006.814.331.1312.4485.80.9612.221/202.006.814.331.1312.4485.80.9612.221/202.006.814.331.1290.5189.60.9612.221/202.006.814.331.1290.5189.60.9612.221/202.006.814.331.1290.5189.60.9612.221/202.006.814.331.1290.5189.60.9612.22<							
CASING VOLUME CALCULATION:ft of water Xgallons/ =total gallons/casing volume in casing foot Equipment Used: Dedicated Bladder Pump Nondedicated Bladder Pump Bailer Other Time Amount Purged Flow Rate pH Temp Conductivity Turbidity ORP D.O. Water (ml/min) PH (C) (mmhos/cm) (NTUs) (mV) (mV) (mg/L) (it TOC) (it TO							
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1215       1.40       300       6.8       14.33       1.181       2.74       85.8       0.42       2.22         120       2.00       300       6.8       14.32       1.179       0.51       89.6       0.96       12.22         120       2.00       6.8       14.32       1.179       0.51       89.6       0.96       12.22         120       Continued on back (circle one) yes / 10       10       10       10       10							
120         2.00         6.8         14.31         1.179         0.51         89.6         0.96         12.27           Continued on back (circle one) yes / 10							
Continued on back (circle one) yes / no							
SAMPLING Equipment Used: Same as above Other							
Sample Time (24 hr)Total Purged (gals)pHTemp (C)Conductivity (mmhos/cm)Turbidity (NTUs)ORP (mV)D.O. (mV)Depth to 							
1225 200 6.3 14.32 1,179 0.51 396 0.96 12.22 -							
FINAL DEPTH TO WATER (ft TOC): 12.22 TIME FINAL DEPTH TAKEN: 1220							
SAMPLEID: MW-16 GWOZ SAMPLEID FOR QC:							
PARAMETERS REQUESTED FOR ANALYSIS: Appendix III & select Appendix IV							
FERROUS IRON (mg/L): IDW TOTAL; 200 gal							
METER MODEL No.:YSI MPS 556							
CHECKED FLOW THROUGH CELL FOR LEAKS: V COMMENTS: NIA							
NAME <u>SIGNATURE</u> DATE							
()							
REVIEWED:							

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July 3, 2014 88777 J. Hammen	ADAMANT ES 2019 88777 J. Excanory
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puerter: 703-805, 5-10 mph sw, partly clary	lessinel Jonathan Hermann
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105 10338777 J. Kimmon 17-20-14 Bar, Baying mk 2/t 1:35 Collect Male ZA-16002) + 10ap-1/6002] Les Aquerite II & The parameters ____ 1355 Solup @ m43_ 1400 1 Bog Promy Mur 3 1435: Idledt Min-3/6402 for Aprill & start TE 1445 : Set up @ MN-41____ 1450; Beyn purging Wer - 4 1630; (olled My-Huwoz) For Rap. on & selar of 1530 Colorn w/ be pret cooles ____ 1545: 248-520 to be ap could off Child

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405 304 13204 Jihranson - 11125149 mil L Notes i onk 10 ____ 19.94 - Mars - 2 510 Mens lost needed . 10:61 8117-16 1514 12.63 non lock north 1522 Dry -ZA 19,25 1825 MV - 72 _____ 11.52 MH-4 1528 11.09 New Lork needed 1533 WAR -12. MANN- 6 638 14.96 70:43.37 1620 20.08_-______ (AUM : ] -_____ _ 1610 10:74 MA-13 103 m - 16 12.10 -----16:16 10-34 malach, simonson mar Cz 1625 1130 Dehra Lycoff'sta =1 27 2

APPENDIX E – ANALYTICAL REPORTS AND DATA VALIDATION

### Memorandum



Date:August 26, 2019To:Brian HoyeFrom:Kortney BlaufussRe:Quality Assurance/Quality Control (QA/QC) Review of Analytical Data<br/>Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas<br/>Nearman Creek Power Station Bottom Ash Pond – July 2019<br/>Project No. 88777

Groundwater samples were collected to establish background conditions at the Nearman Creek Power Station Bottom Ash Pond at the Kansas City Board of Public Utilities (BPU) site in Kansas City, Kansas. The samples were collected July 1 through 3, 2019 and submitted to Pace Analytical National Center for Testing and Innovation of Mount Juliet, Tennessee (PACE) for analysis by one or more of the following methods:

Parameters	Analytical Method
Total Metals ¹	SW-846 6010B/6020
Total Mercury	SW-846 7470A
Total Dissolved Solids (TDS)	SM 2540 C-2011
Anions (chloride, fluoride, sulfate)	SW-846 9056A
pH	SW-846 9040C
Radium 226 and 228 ² (Combined)	SM 7500 Ra B M (radium-226)
	EPA 904.0/9320 (radium-228)

Notes:

¹Metals 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. ²Project 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. <u>Chain-of-Custody (COC)</u> The relinquished and received signatures, times, and dates on the COCs were present. The following were also noted:
  - Sample Delivery Group (SDG) L1115520 and L1115755: Samples DUP-2, Floodwater 1 and Floodwater 2 were placed on hold and not analyzed for this sampling event.
  - The lab noted upon arrival that sample containers for MW-8A were labeled as the Matrix Spike/Matrix Spike Duplicate (MS/MSD). Upon receiving update sample collection information, the MS/MSD sample containers were re-labeled as MW-2A as indicated by the COC. MS/MSD analyses were performed on the correct sample containers (MW-2A).

#### Memorandum (continued)



August 26, 2018 Page 2

- 2. <u>Requested Analyses Completed</u> All analyses were completed as requested for the appropriate background parameters for the July groundwater sampling event.
- 3. <u>Holding Times</u> All samples were analyzed within the recommended method holding times except for the following:
  - The laboratory pH value for one or more samples in SDGs L1115520 and L1116030 were not measured within the recommended 24-hour holding time. Because pH was also measured in the field at the time of sample collection and no significant differences were noted, these laboratory pH results were qualified as estimated (J) rather than rejected.
- 4. <u>Sample Preservation</u> All samples were received by the laboratory within the recommended 4 degrees Celsius ( $^{\circ}$ C)  $\pm$  2  $^{\circ}$ C sample preservation temperature range.
- 5. <u>Laboratory Method Blanks</u> 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:
  - Calcium was detected in the method blank for batch WG1313685 at a low-level concentration below the reporting limit. The associated sample was greater than five times the method blank, so no qualifiers were required.
  - Sulfate was detected in the method blank for batch WG1310272. The associated sample was greater than five times the method blank, so no qualifiers were required.
  - Radium-226 and radium-228 were detected in the method blanks. Because the majority of the associated samples had combined radium values less than five times the combined blank value, the data was evaluated as follows:

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. Thus, rather than qualifying all samples nondetect (U) based on the radium-226/228 method blank detections, and because these data will be used for statistical analyses, the samples were qualified as follows:

SDG L1115755: All associated samples, except MW-3, had combined radium values less than five times the combined blank value. It's unknown if these combined radium results are due to possible cross-contamination or accurate concentrations. Because combined radium has historically been detected in these wells, they were qualified as estimated (J) based on professional judgment.

#### Memorandum (continued)



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- SDG L1116033: The associated sample had a combined radium value greater than five times the combined blank value. Cross contamination was not a concern and no qualifiers were necessary.
- 6. <u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u> 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. <u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u> 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. The site specific MS/MSD was performed on sample MW-2A. All site-specific MS/MSD analyses were within their respective QC limits, except for the following:
  - Low MS/MSD RECs for calcium were noted. However, the spike amount was less than four times the parent sample concentration. No conclusion could be drawn from this MS/MSD analysis, and no qualification was necessary.
  - Sulfate MS/MSD results were flagged with an "E" by the laboratory to indicate that the concentration exceeded the calibration range of the instrument. No conclusions could be made regarding the accuracy of these spikes, and no data were qualified.
- 8. <u>Laboratory Duplicate Results</u> 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. <u>Field Duplicate Results</u> 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:

#### Memorandum (continued)



August 26, 2018 Page 4

- 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 activity (MDA), 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 July 2019 sampling event. Table 2 presents the sideby-side comparison of the field duplicate detections. 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-2A // Dup-1: All field duplicate results were adequately replicated.
- 10. <u>Detection and Quantitation Limits</u> Dilutions were noted for sulfate in the following samples, to account for high concentrations of target analytes and/or matrix interferences: MW-8A, MW-13, MW-15, MW-16 and MW-10. No qualifiers were added based on dilutions.
- 11. <u>Conclusion</u> The data were reviewed for achievement of any method-specified QA/QC criteria. Table 1 presents a summary of data qualifiers that were qualified during the course of this review. The data are valid for use, as qualified, in reporting the results of this investigation.

#### Attachments

Table 1: Data QualifiersTable 2: Field Duplicate Results (Detections Only)

# Table 1Data QualifiersKansas City Board of Public Utilities (BPU) - Kansas City, KansasNearman Creek Power Station Bottom Ash Pond – July 2019

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
MW-2A	L1115520-01			
MW-3	L1115520-02			
MW-4	L1115520-03			Immediate pH analysis is recommended. All pH
MW-8A	L1115520-04			measurements for these samples were performed more
MW-13	L1115520-05	рН	1	than 24 hours after sample collection. Because field pH
MW-14	L1115520-06	рп	J	measurements were also recorded and no significant
MW-15	L1115520-07			differences were noted, the results were qualified as estimated (J) rather than rejected (R).
MW-16	L1115520-08			
DUP-1 (MW-2A)	L1115520-09			
MW-10	L1116030-01			
MW-2A	L1115755-01			
MW-4	L1115755-03			Mathed Blank Datestian
MW-8A	L1115755-04			Method Blank Detection
MW-13	L1115755-05	Combined Radium	1	Because combined radium has historically been detected in these wells, they were qualified as estimated (J) based
MW-14	L1115755-06		J	on professional judgment.
MW-15	L1115755-07			See Text
MW-16	L1115755-08			
DUP-1 (MW-2A)	L1115755-09			

J - Qualified as estimated

R - Data was rejected

#### Table 2

#### Field Duplicate Results (Detections Only) Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – July 2019

Parameter	Unit	MW-2A L1115520-01	Dup-1 L1115520-09	Meets QC Criteria
Total Dissolved Solids	mg/l	462	462	Yes
рН	mg/l	8.23 J	7.17 J	Yes
Chloride	mg/l	8.82	8.96	Yes
Fluoride	mg/l	0.230	0.229	Yes
Sulfate	mg/l	86.3	87.2	Yes
Barium, Total	mg/l	0.110	0.107	Yes
Calcium, Total	mg/l	127	127	Yes
Lithium, Total	mg/l	0.0204	0.0202	Yes

Parameter	Unit	MW-2A L1115755-01	Dup-1 L1115755-09	Meets QC Criteria
Radium-226		0.178	0.127	
(Uncertainty)	pCi/l	(+/- 0.213)	(+/- 0.251)	Yes
Radium-228	nCi/l	0.140	0.269	Yes
(Uncertainty)	pCi/l	(+/- 0.464)	(+/- 0.448)	res
Radium-226 + 228 (Calc)	pCi/l	0.318 J	0.396 J	Yes

J - qualified as estimated

mg/l = milligrams per liter

pCi/l = picoCuries/liter

QC = quality control



## ANALYTICAL REPORT

#### Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1115520 07/03/2019 KCBPU Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Tacy Kennedy

Stacy Kennedy Project Manager

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

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 1 of 31

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

#### TABLE OF CONTENTS

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

Cp: Cover Page	
Tc: Table of Contents	
Ss: Sample Summary	
Cn: Case Narrative	
Sr: Sample Results	
MW-2A/GW01 L1115520-01	
MW-3/GW01 L1115520-02	
MW-4/GW01 L1115520-03	
MW-8A/GW01 L1115520-04	
MW-13/GW01 L1115520-05	
MW-14GW01 L1115520-06	
MW-15/GW01 L1115520-07	
MW-16/GW01 L1115520-08	
DUP-1/GW01 L1115520-09	
Qc: Quality Control Summary	
Gravimetric Analysis by Method 2540 C-2011	
Wet Chemistry by Method 9040C	
Wet Chemistry by Method 9056A	
Mercury by Method 7470A	
Metals (ICP) by Method 6010B	
Metals (ICPMS) by Method 6020	1
GI: Glossary of Terms	
Al: Accreditations & Locations	
Sc: Sample Chain of Custody	

SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 2 of 31

#### SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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			Collected by	Collected date/time	Received da	te/time
MW-2A/GW01 L1115520-01 GW			Jonathan Hermanson	07/01/19 15:25	07/03/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1306715	1	07/06/19 11:52	07/06/19 11:52	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 17:45	07/09/19 17:45	ST	Mt. Juliet, TN
Mercury by Method 7470A	WG1313705	1	07/18/19 14:00	07/18/19 21:51	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1313685	1	07/18/19 14:56	07/19/19 12:08	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1313694	1	07/18/19 14:34	07/18/19 18:31	LD	Mt. Juliet, TN

MW-3/GW01 L1115520-02 GW			Collected by Jonathan Hermanson	Collected date/time 07/01/19 16:45	Received da 07/03/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1306715	1	07/06/19 11:52	07/06/19 11:52	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 18:45	07/09/19 18:45	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:03	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:16	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:12	JPD	Mt. Juliet, TN

MW-4/GW01 L1115520-03 GW			Collected by Jonathan Hermanson	Collected date/time 07/02/19 09:45	Received dat 07/03/19 08:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1307665	1	07/09/19 12:12	07/09/19 12:49	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307144	1	07/08/19 10:11	07/08/19 10:11	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 19:44	07/09/19 19:44	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:05	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:19	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:16	JPD	Mt. Juliet, TN

			Collected by	Collected date/time	Received date/time	
MW-8A/GW01 L1115520-04 GW Method Gravimetric Analysis by Method 2540 C-2011 Wet Chemistry by Method 9040C			Jonathan Hermanson	07/01/19 14:05	07/03/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1306715	1	07/06/19 11:52	07/06/19 11:52	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 20:03	07/09/19 20:03	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	5	07/10/19 08:20	07/10/19 08:20	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:08	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:21	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:30	JPD	Mt. Juliet, TN

MW-13/GW01 L1115520-05 GW			Collected by Jonathan Hermanson	Collected date/time 07/02/19 12:20	Received da 07/03/19 08:	
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1307665	1	07/09/19 12:12	07/09/19 12:49	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1306715	1	07/06/19 11:52	07/06/19 11:52	JIC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 20:23	07/09/19 20:23	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	5	07/10/19 08:40	07/10/19 08:40	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:10	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:24	TRB	Mt. Juliet, TN
ACCOUNT:	PROJECT:		SDG:	DAT	E/TIME:	PA

Kansas City Board of Public UtilitiesKCBPU NearmanL1115520

#### SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

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MW-13/GW01 L1115520-05 GW			Collected by Jonathan Hermanson	Collected date/time 07/02/19 12:20	Received date/time 07/03/19 08:00	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:35	JPD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-14GW01 L1115520-06 GW			Jonathan Hermanson	07/02/19 08:10	07/03/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1307665	1	07/09/19 12:12	07/09/19 12:49	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307144	1	07/08/19 10:11	07/08/19 10:11	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 20:43	07/09/19 20:43	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:12	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:26	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:39	JPD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	
MW-15/GW01 L1115520-07 GW			Jonathan Hermanson	07/01/19 12:15	07/03/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307144	1	07/08/19 10:11	07/08/19 10:11	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 21:01	07/09/19 21:01	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	5	07/10/19 09:00	07/10/19 09:00	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:15	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:34	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:44	JPD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-16/GW01 L1115520-08 GW			Jonathan Hermanson	07/01/19 09:00	07/03/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307144	1	07/08/19 10:11	07/08/19 10:11	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 21:21	07/09/19 21:21	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	5	07/10/19 09:20	07/10/19 09:20	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:21	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:37	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:48	JPD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
DUP-1/GW01 L1115520-09 GW			Jonathan Hermanson	07/01/19 00:00	07/03/19 08:	00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1306964	1	07/08/19 07:28	07/08/19 09:40	TH	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307144	1	07/08/19 10:11	07/08/19 10:11	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1308403	1	07/09/19 21:40	07/09/19 21:40	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1306165	1	07/03/19 20:00	07/05/19 12:24	ABL	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1306330	1	07/05/19 10:42	07/08/19 21:39	TRB	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1306331	1	07/05/19 19:47	07/08/19 02:53	JPD	Mt. Juliet, TN

PROJECT: KCBPU Nearman SDG: L1115520 DATE/TIME: 07/22/19 17:19

7:19

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#### CASE NARRATIVE

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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.

enned

Stacy Kennedy Project Manager

#### **Project Narrative**

Per attached nonconformance form, MS/MSD containers were initially labeled as MW-2A (as indicated by the chain of custody). Upon receiving updated sample collection information, MS/MSD sample containers were relabeled correctly as MW-8A. MS/MSD analyses were performed on correct corresponding sample containers of MW-2A. SK 7/19/19

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 5 of 31

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

#### SAMPLE RESULTS - 01 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

							10
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	462		10.0	1	07/08/2019 09:40	WG1306964	́Тс
Wet Chemistry by	/ Method 90400	2					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	SU			date / time			⁴ Cn
рЦ	8.23	TΩ	1	07/06/2010 11.52	WC1206715		

#### Wet Chemistry by Method 9040C

						-
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		4
рН	8.23	<u>T8</u>	1	07/06/2019 11:52	WG1306715	Ľ

#### Sample Narrative:

L1115520-01 WG1306715: 8.23 at 21.9C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	7
Analyte	mg/l		mg/l		date / time		
Chloride	8.82		1.00	1	07/09/2019 17:45	WG1308403	8
Fluoride	0.230		0.100	1	07/09/2019 17:45	WG1308403	Å
Sulfate	86.3		5.00	1	07/09/2019 17:45	WG1308403	
							9

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/18/2019 21:51	WG1313705

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	_
Barium	0.110		0.00500	1	07/19/2019 12:08	WG1313685
Beryllium	ND		0.00200	1	07/19/2019 12:08	WG1313685
Boron	ND		0.200	1	07/19/2019 12:08	WG1313685
Cadmium	ND		0.00200	1	07/19/2019 12:08	WG1313685
Calcium	127	V	1.00	1	07/19/2019 12:08	WG1313685
Chromium	ND		0.0100	1	07/19/2019 12:08	WG1313685
Cobalt	ND		0.0100	1	07/19/2019 12:08	WG1313685
Lithium	0.0204		0.0150	1	07/19/2019 12:08	WG1313685
Molybdenum	ND		0.00500	1	07/19/2019 12:08	WG1313685

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/18/2019 18:31	WG1313694
Arsenic	ND		0.00200	1	07/18/2019 18:31	WG1313694
Lead	ND		0.00200	1	07/18/2019 18:31	WG1313694
Selenium	ND		0.00200	1	07/18/2019 18:31	WG1313694
Thallium	ND		0.00200	1	07/18/2019 18:31	WG1313694

#### SAMPLE RESULTS - 02 L1115520



Qc

#### Gravimetric Analysis by Method 2540 C-2011

eravine and / analy		-0.0020					Co
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	506		10.0	1	07/08/2019 09:40	WG1306964	² Tc
Wet Chemistry by	Method 90400	2					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	SU			date / time			⁴ Cn
pU	7 22	то	1	07/06/2010 11-51	0 WC120671E		

#### Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	SU			date / time		4
рН	7.23	<u>T8</u>	1	07/06/2019 11:52	WG1306715	

#### Sample Narrative:

L1115520-02 WG1306715: 7.23 at 21.9C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ Gl
Analyte	mg/l		mg/l		date / time		
Chloride	7.37		1.00	1	07/09/2019 18:45	WG1308403	8
Fluoride	0.218		0.100	1	07/09/2019 18:45	WG1308403	ĬAĬ
Sulfate	66.9		5.00	1	07/09/2019 18:45	WG1308403	
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:03	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.162		0.00500	1	07/08/2019 21:16	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:16	WG1306330
Boron	ND		0.200	1	07/08/2019 21:16	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:16	WG1306330
Calcium	136		1.00	1	07/08/2019 21:16	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:16	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:16	WG1306330
Lithium	0.0239		0.0150	1	07/08/2019 21:16	<u>WG1306330</u>
Molybdenum	ND		0.00500	1	07/08/2019 21:16	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:12	WG1306331
Arsenic	0.00216		0.00200	1	07/08/2019 02:12	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:12	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:12	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:12	WG1306331

#### SAMPLE RESULTS - 03 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

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	Result	Qualifier	RDL	Dilution	Analysis	Batch		CP
Analyte	mg/l		mg/l		date / time			2
Dissolved Solids	358		10.0	1	07/09/2019 12:49	WG1307665		Tc

#### Wet Chemistry by Method 9040C

Wet Chemistry by Metho	od 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	SU			date / time		⁴ Cn
рН	7.56	<u>T8</u>	1	07/08/2019 10:11	WG1307144	СП

#### Sample Narrative:

L1115520-03 WG1307144: 7.56 at 13.3C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		G
Chloride	8.22		1.00	1	07/09/2019 19:44	WG1308403	8
Fluoride	0.314		0.100	1	07/09/2019 19:44	WG1308403	Ă١
Sulfate	64.1		5.00	1	07/09/2019 19:44	<u>WG1308403</u>	
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:05	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.112		0.00500	1	07/08/2019 21:19	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:19	WG1306330
Boron	ND		0.200	1	07/08/2019 21:19	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:19	WG1306330
Calcium	89.9		1.00	1	07/08/2019 21:19	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:19	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:19	WG1306330
Lithium	0.0177		0.0150	1	07/08/2019 21:19	<u>WG1306330</u>
Molybdenum	ND		0.00500	1	07/08/2019 21:19	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:16	WG1306331
Arsenic	ND		0.00200	1	07/08/2019 02:16	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:16	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:16	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:16	WG1306331

#### SAMPLE RESULTS - 04 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilutior	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	636		10.0	1	07/08/2019 09:40	WG1306964
Wet Chemistry by	Method 9040C					
	Posult	Qualifier	Dilution	Analysis	Batch	

#### Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		4 Cn
рН	7.25	<u>T8</u>	1	07/06/2019 11:52	WG1306715	CII

#### Sample Narrative:

L1115520-04 WG1306715: 7.25 at 22.2C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ CI
Analyte	mg/l		mg/l		date / time		GI
Chloride	21.0		1.00	1	07/09/2019 20:03	WG1308403	8
Fluoride	0.251		0.100	1	07/09/2019 20:03	WG1308403	٦A
Sulfate	223		25.0	5	07/10/2019 08:20	WG1308403	
N.A							⁹ Sc
Mercury by Metho	Da /4/0A						

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:08	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.201		0.00500	1	07/08/2019 21:21	WG1306330
eryllium	ND		0.00200	1	07/08/2019 21:21	<u>WG1306330</u>
oron	1.06		0.200	1	07/08/2019 21:21	<u>WG1306330</u>
admium	ND		0.00200	1	07/08/2019 21:21	<u>WG1306330</u>
lcium	105		1.00	1	07/08/2019 21:21	<u>WG1306330</u>
romium	ND		0.0100	1	07/08/2019 21:21	<u>WG1306330</u>
obalt	ND		0.0100	1	07/08/2019 21:21	<u>WG1306330</u>
thium	0.0277		0.0150	1	07/08/2019 21:21	<u>WG1306330</u>
olybdenum	0.00524		0.00500	1	07/08/2019 21:21	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:30	WG1306331
Arsenic	0.0128		0.00200	1	07/08/2019 02:30	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:30	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:30	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:30	WG1306331

#### SAMPLE RESULTS - 05 L1115520



Qc

#### Gravimetric Analysis by Method 2540 C-2011

								Cn
	Result	Qualifier	RDL	Dilution	Analysis	Batch		CP
Analyte	mg/l		mg/l		date / time			2
Dissolved Solids	520		10.0	1	07/09/2019 12:49	WG1307665		Tc

#### Wet Chemistry by Method 9040C

Wet Chemistry by Metho	od 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	SU			date / time		4 Cn
pH	7.08	<u>T8</u>	1	07/06/2019 11:52	WG1306715	CII

#### Sample Narrative:

L1115520-05 WG1306715: 7.08 at 22.1C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	7 CI
Analyte	mg/l		mg/l		date / time		G
Chloride	22.1		1.00	1	07/09/2019 20:23	WG1308403	8
Fluoride	0.317		0.100	1	07/09/2019 20:23	WG1308403	ĬAĬ
Sulfate	154		25.0	5	07/10/2019 08:40	WG1308403	
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:10	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.235		0.00500	1	07/08/2019 21:24	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:24	WG1306330
Boron	ND		0.200	1	07/08/2019 21:24	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:24	WG1306330
Calcium	90.9		1.00	1	07/08/2019 21:24	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:24	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:24	WG1306330
Lithium	0.0314		0.0150	1	07/08/2019 21:24	<u>WG1306330</u>
Molybdenum	ND		0.00500	1	07/08/2019 21:24	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:35	<u>WG1306331</u>
Arsenic	0.00957		0.00200	1	07/08/2019 02:35	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:35	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:35	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:35	WG1306331

#### SAMPLE RESULTS - 06 L1115520



Qc

#### Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch		Ср
Analyte	mg/l		mg/l		date / time			2
Dissolved Solids	490		10.0	1	07/09/2019 12:49	WG1307665		Tc
Wet Chemistry by	Method 90400	2						³ Ss
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	SU			date / time				⁴ Cn
nН	7 21	TΩ	1	07/08/2010 10:11	1 WC1307144			

#### Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	SU			date / time		⁴
рН	7.21	<u>T8</u>	1	07/08/2019 10:11	WG1307144	

#### Sample Narrative:

L1115520-06 WG1307144: 7.21 at 16.3C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		G
Chloride	10.5		1.00	1	07/09/2019 20:43	WG1308403	8
Fluoride	0.231		0.100	1	07/09/2019 20:43	<u>WG1308403</u>	Ă
Sulfate	82.0		5.00	1	07/09/2019 20:43	WG1308403	
							°Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:12	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0740		0.00500	1	07/08/2019 21:26	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:26	WG1306330
Boron	ND		0.200	1	07/08/2019 21:26	<u>WG1306330</u>
Cadmium	ND		0.00200	1	07/08/2019 21:26	<u>WG1306330</u>
Calcium	114		1.00	1	07/08/2019 21:26	<u>WG1306330</u>
Chromium	ND		0.0100	1	07/08/2019 21:26	<u>WG1306330</u>
Cobalt	ND		0.0100	1	07/08/2019 21:26	WG1306330
Lithium	ND		0.0150	1	07/08/2019 21:26	<u>WG1306330</u>
Molybdenum	ND		0.00500	1	07/08/2019 21:26	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:39	<u>WG1306331</u>
Arsenic	ND		0.00200	1	07/08/2019 02:39	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:39	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:39	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:39	WG1306331

#### SAMPLE RESULTS - 07 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		
Dissolved Solids	496		10.0	1	07/08/2019 09:40	<u>WG1306964</u>	
Wet Chemistry by	/ Method 9040C						
	Pocult	Qualifior	Dilution Anal	lucic	Patch		

#### Wet Chemistry by Method 9040C

	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	su			date / time		4 Cn	٦
рН	7.71	<u>T8</u>	1	07/08/2019 10:11	WG1307144		

#### Sample Narrative:

L1115520-07 WG1307144: 7.71 at 16.2C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ Cl
Analyte	mg/l		mg/l		date / time		GI
Chloride	17.4		1.00	1	07/09/2019 21:01	WG1308403	8
Fluoride	0.282		0.100	1	07/09/2019 21:01	WG1308403	Ă
Sulfate	164		25.0	5	07/10/2019 09:00	WG1308403	

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:15	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0970		0.00500	1	07/08/2019 21:34	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:34	WG1306330
Boron	ND		0.200	1	07/08/2019 21:34	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:34	WG1306330
Calcium	88.0		1.00	1	07/08/2019 21:34	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:34	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:34	WG1306330
Lithium	0.0295		0.0150	1	07/08/2019 21:34	<u>WG1306330</u>
Molybdenum	ND		0.00500	1	07/08/2019 21:34	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:44	WG1306331
Arsenic	0.00324		0.00200	1	07/08/2019 02:44	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:44	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:44	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:44	WG1306331

#### SAMPLE RESULTS - 08 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

								Col
	Result	Qualifier	RDL	Dilution	Analysis	Batch		CP
Analyte	mg/l		mg/l		date / time			2
Dissolved Solids	942		20.0	1	07/08/2019 09:40	WG1306964		Tc

#### Wet Chemistry by Method 9040C

Wet Chemistry by Metho	od 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		⁴ Cn
pH	6.76	<u>T8</u>	1	07/08/2019 10:11	WG1307144	CII

#### Sample Narrative:

L1115520-08 WG1307144: 6.76 at 15.4C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ Gl
Analyte	mg/l		mg/l		date / time		G
Chloride	2.54		1.00	1	07/09/2019 21:21	WG1308403	8
Fluoride	0.155		0.100	1	07/09/2019 21:21	WG1308403	ĬAĬ
Sulfate	172		25.0	5	07/10/2019 09:20	WG1308403	
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:21	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	_
Barium	0.259		0.00500	1	07/08/2019 21:37	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:37	WG1306330
Boron	0.217		0.200	1	07/08/2019 21:37	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:37	WG1306330
Calcium	246		1.00	1	07/08/2019 21:37	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:37	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:37	WG1306330
Lithium	0.0635		0.0150	1	07/08/2019 21:37	WG1306330
Molybdenum	ND		0.00500	1	07/08/2019 21:37	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:48	<u>WG1306331</u>
Arsenic	0.0341		0.00200	1	07/08/2019 02:48	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:48	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:48	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:48	WG1306331

#### SAMPLE RESULTS - 09 L1115520



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#### Gravimetric Analysis by Method 2540 C-2011

eravine and / mary							1 Cn
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Cp
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	462		10.0	1	07/08/2019 09:40	WG1306964	Tc

#### Wet Chemistry by Method 9040C

Wet Chemistry by Meth	od 9040C					а С 1997 г. – С br>С 1997 г. – С 1	³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	L	
Analyte	su			date / time		4	⁴ Cn
рН	7.17	<u>T8</u>	1	07/08/2019 10:11	WG1307144		CII

#### Sample Narrative:

L1115520-09 WG1307144: 7.17 at 17C

#### Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		G
Chloride	8.96		1.00	1	07/09/2019 21:40	WG1308403	8
Fluoride	0.229		0.100	1	07/09/2019 21:40	WG1308403	Ă
Sulfate	87.2		5.00	1	07/09/2019 21:40	WG1308403	1
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/05/2019 12:24	WG1306165

#### Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.107		0.00500	1	07/08/2019 21:39	WG1306330
Beryllium	ND		0.00200	1	07/08/2019 21:39	WG1306330
Boron	ND		0.200	1	07/08/2019 21:39	WG1306330
Cadmium	ND		0.00200	1	07/08/2019 21:39	WG1306330
Calcium	127		1.00	1	07/08/2019 21:39	WG1306330
Chromium	ND		0.0100	1	07/08/2019 21:39	WG1306330
Cobalt	ND		0.0100	1	07/08/2019 21:39	WG1306330
Lithium	0.0202		0.0150	1	07/08/2019 21:39	WG1306330
Molybdenum	ND		0.00500	1	07/08/2019 21:39	WG1306330

#### Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 02:53	<u>WG1306331</u>
Arsenic	ND		0.00200	1	07/08/2019 02:53	WG1306331
Lead	ND		0.00200	1	07/08/2019 02:53	WG1306331
Selenium	ND		0.00200	1	07/08/2019 02:53	WG1306331
Thallium	ND		0.00200	1	07/08/2019 02:53	WG1306331

Gravimetric Analysis by Method 2540 C-2011

## QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3429526-1 07/08/19 09:40					
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Dissolved Solids	U		2.82	10.0	

#### L1115520-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1115520-08 07/08	3/19 09:40 • (DUP)	) R3429526-3	3 07/08/19	09:40		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	942	944	1	0.212		5

#### Laboratory Control Sample (LCS)

(LCS) R3429526-2 0	(LCS) R3429526-2 07/08/19 09:40								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	mg/l	mg/l	%	%					
Dissolved Solids	8800	8840	100	85.0-115					

DATE/TIME: 07/22/19 17:19 PAGE: 15 of 31

Gravimetric Analysis by Method 2540 C-2011

## QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3429714-1 07/09/19 12:49					
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Dissolved Solids	U		2.82	10.0	

#### L1115281-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1115281-01 07/09/19	9 12:49 • (DUP) R	3429714-3 0	7/09/19 12:	49		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	728	731	1	0.366		5

#### Laboratory Control Sample (LCS)

(LCS) R3429714-2 07	(LCS) R3429714-2 07/09/19 12:49							
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier			
Analyte	mg/l	mg/l	%	%				
Dissolved Solids	8800	8970	102	85.0-115				

SDG: L1115520 DATE/TIME: 07/22/19 17:19

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Wet Chemistry by Method 9040C

#### QUALITY CONTROL SUMMARY L1115520-01,02,04,05

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#### L1115171-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1115171-03 07/06/19 11:52 • (DUP) R3428109-2 07/06/19 11:52										
	Original Result				DUP Qualifier	DUP RPD Limits				
Analyte	SU	su		%		%				
рН	8.29	8.30	1	0.121		1				
Sample Narrative: OS: 8.29 at 22.2C										

DUP: 8.3 at 22.3C

#### L1115520-05 Original Sample (OS) • Duplicate (DUP)

#### (OS) L1115520-05 07/06/19 11:52 • (DUP) R3428109-3 07/06/19 11:52 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 7.08 7.06 1 0.283 1 Sample Narrative:

OS: 7.08 at 22.1C

DUP: 7.06 at 22.2C

#### Laboratory Control Sample (LCS)

(LCS) R3428109-1 07/06/19 11:52										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	su	SU	%	%						
pН	10.0	9.95	99.5	99.0-101						

#### Sample Narrative:

LCS: 9.95 at 22.8C

SDG: L1115520

DATE/TIME: 07/22/19 17:19

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY

#### L1115844-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1115844-01 07/08/19 10:11 • (DUP) R3428336-3 07/08/19 10:11									
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	P RPD nits			
Analyte	su	su		%					
рН	8.82	8.83	1	0.113					
Sample Narrative:									
OS: 8.82 at 19.6C									
DUP: 8.83 at 19.6C									

#### Laboratory Control Sample (LCS)

#### (LCS) R3428336-1 07/08/19 10:11

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

#### Sample Narrative:

LCS: 9.99 at 22C

² Tc
³ Ss
⁴ Cn
⁵ Sr
 ⁶ Qc
⁷ Gl
⁸ Al

Sc

SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 18 of 31 Wet Chemistry by Method 9056A

## QUALITY CONTROL SUMMARY

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Method Blank (MB)

(MB) R3429185-1	/IB) R3429185-1 07/09/19 13:24							
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	mg/l		mg/l	mg/l				
Chloride	U		0.0519	1.00				
Fluoride	U		0.00990	0.100				
Sulfate	U		0.0774	5.00				

#### L1115338-08 Original Sample (OS) • Duplicate (DUP)

	( ,					
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	ND	0.775	1	0.000		15
Fluoride	ND	0.0963	1	0.000		15
Sulfate	ND	1.37	1	0.000		15

#### L1115712-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1115712-01 07/09/19 22:20 • (DUP) R3429185-6 07/09/19 22:39											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits					
Analyte	mg/l	mg/l		%		%					
Chloride	1.21	1.24	1	2.52		15					
Fluoride	0.299	0.299	1	0.167		15					
Sulfate	ND	1.97	1	0.000		15					

#### Laboratory Control Sample (LCS)

(LCS) R3429185-2 07/09/	LCS) R3429185-2 07/09/19 13:43									
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	mg/l	mg/l	%	%						
Chloride	40.0	38.9	97.2	80.0-120						
Fluoride	8.00	8.11	101	80.0-120						
Sulfate	40.0	39.5	98.7	80.0-120						

ACCOUNT:									
Kansas City Board of Public Utilities									

PROJECT: KCBPU Nearman SDG: L1115520 DATE/TIME: 07/22/19 17:19

PAGE: 19 of 31 Wet Chemistry by Method 9056A

## QUALITY CONTROL SUMMARY

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#### L1115520-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115520-01 07/09/19 17:45 • (MS) R3429185-4 07/09/19 18:05 • (MSD) R3429185-5 07/09/19 18:25												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	50.0	8.82	59.6	59.5	102	101	1	80.0-120			0.191	15
Fluoride	5.00	0.230	5.24	5.24	100	100	1	80.0-120			0.0401	15
Sulfate	50.0	86.3	135	135	98.0	97.8	1	80.0-120	E	E	0.0886	15

#### L1115712-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1115712-01 07/09/19	9 22:20 • (MS) R3	3429185-7 07/	09/19 23:39				
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
Analyte	mg/l	mg/l	mg/l	%		%	
Chloride	50.0	1.21	51.4	100	1	80.0-120	
Fluoride	5.00	0.299	5.30	100	1	80.0-120	
Sulfate	50.0	ND	51.8	99.7	1	80.0-120	

DATE/TIME: 07/22/19 17:19 PAGE: 20 of 31

Mercury by Method 7470A

## QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3427870-1 (	07/05/19 11:31			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Mercury	U		0.0000490	0.000200

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3427870-2 07/05/19 11:33 • (LCSD) R3427870-3 07/05/19 11:36											
		Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
	Mercury	0.00300	0.00313	0.00312	104	104	80.0-120			0.231	20

#### L1115434-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115434-02 07/05/19	9 11:38 • (MS) R3	3427870-4 07/	05/19 11:40 • (N	ISD) R3427870	-5 07/05/19 11:	43						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	ma/l	mg/l	mg/l	ma/l	%	0/		0/			0/_	0/
	iiig/i	mg/i	ilig/i	ilig/i	70	/0		/0			/0	70

SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 21 of 31

Mercury by Method 7470A

## QUALITY CONTROL SUMMARY

#### Method Blank (MB)

(MB) R3432121-1 07	7/18/19 21:43			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Mercury	U		0.0000490	0.000200

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3432121-2 07/18/1	19 21:46 • (LCSD)	) R3432121-3	07/18/19 21:48							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%

#### L1115520-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115520-01 07/18/19	21:51 • (MS) R3	432121-4 07/18	s/19 22:00 • (M	SD) R3432121-	5 07/18/19 22:0	02						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Mercury	0.00300	ND	0.00304	0.00309	101	103	1	75.0-125			1.79	20

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Metals (ICP) by Method 6010B

## QUALITY CONTROL SUMMARY

#### Method Blank (MB)

(MB) R3428677-1	07/08/19 20:34

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	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.00170	0.00500
Beryllium	U		0.000700	0.00200
Boron	U		0.0126	0.200
Cadmium	U		0.000700	0.00200
Calcium	U		0.0463	1.00
Chromium	U		0.00140	0.0100
Cobalt	U		0.00230	0.0100
Lithium	U		0.00530	0.0150
Molybdenum	U		0.00160	0.00500

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3428677-2 07/08/	/19 20:36 • (LCS	SD) R3428677-	3 07/08/19 20:	:38						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Barium	1.00	0.994	0.998	99.4	99.8	80.0-120			0.436	20
Beryllium	1.00	0.971	0.973	97.1	97.3	80.0-120			0.253	20
Boron	1.00	0.950	0.947	95.0	94.7	80.0-120			0.355	20
Cadmium	1.00	0.977	0.981	97.7	98.1	80.0-120			0.392	20
Calcium	10.0	9.58	9.70	95.8	97.0	80.0-120			1.27	20
Chromium	1.00	0.955	0.962	95.5	96.2	80.0-120			0.748	20
Cobalt	1.00	0.981	0.985	98.1	98.5	80.0-120			0.363	20
Lithium	1.00	0.960	0.962	96.0	96.2	80.0-120			0.196	20
Molybdenum	1.00	0.988	1.00	98.8	100	80.0-120			1.15	20

#### L1115620-12 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits	
analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%	
Barium	1.00	0.860	1.85	1.84	99.4	98.0	1	75.0-125			0.743	20	
Beryllium	1.00	ND	1.00	0.988	100	98.8	1	75.0-125			1.39	20	
Boron	1.00	ND	1.07	1.08	98.7	100	1	75.0-125			1.33	20	
Cadmium	1.00	ND	1.00	0.994	100	99.4	1	75.0-125			1.08	20	
Calcium	10.0	92.9	102	101	86.3	80.6	1	75.0-125			0.567	20	
Chromium	1.00	ND	0.973	0.959	97.3	95.9	1	75.0-125			1.47	20	
Cobalt	1.00	ND	0.990	0.980	98.4	97.5	1	75.0-125			0.936	20	
ithium	1.00	ND	0.984	0.977	97.8	97.1	1	75.0-125			0.718	20	
lolybdenum	1.00	ND	1.02	1.01	102	101	1	75.0-125			1.16	20	

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1115520

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07/22/19 17:19

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Metals (ICP) by Method 6010B

## QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3432407-1	07/19/19 12:00	

	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Barium	U		0.00170	0.00500	
Beryllium	U		0.000700	0.00200	
Boron	U		0.0126	0.200	
Cadmium	U		0.000700	0.00200	
Calcium	0.0468	J	0.0463	1.00	
Chromium	U		0.00140	0.0100	
Cobalt	U		0.00230	0.0100	
Lithium	U		0.00530	0.0150	
Molybdenum	U		0.00160	0.00500	

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3432407-2 07/1	9/19 12:03 • (LCSE	D) R3432407-3	8 07/19/19 12:0	5						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Barium	1.00	1.03	1.04	103	104	80.0-120			0.663	20
Beryllium	1.00	0.997	0.998	99.7	99.8	80.0-120			0.138	20
Boron	1.00	1.01	1.01	101	101	80.0-120			0.399	20
Cadmium	1.00	0.995	1.00	99.5	100	80.0-120			0.845	20
Calcium	10.0	10.0	10.1	100	101	80.0-120			0.721	20
Chromium	1.00	0.992	1.00	99.2	100	80.0-120			0.793	20
Cobalt	1.00	1.02	1.03	102	103	80.0-120			0.842	20
Lithium	1.00	1.01	1.01	101	101	80.0-120			0.0413	20
Molybdenum	1.00	0.983	0.987	98.3	98.7	80.0-120			0.380	20

#### L1115520-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

mg/l 0.110 ND ND ND	mg/l 1.14 1.01 1.13 1.02	mg/l 1.15 1.01 1.14 1.03	% 103 101 104	% 104 101 105	1 1 1	% 75.0-125 75.0-125 75.0-125			% 0.536 0.168 0.870	% 20 20 20	
ND ND ND	1.01 1.13	1.01 1.14	101 104	101 105	1 1 1	75.0-125			0.168	20	
ND ND	1.13	1.14	104	105	1 1						
ND					1	75.0-125			0.970	20	
	1.02	1.03	100						0.670	20	
		1.00	102	103	1	75.0-125			0.613	20	
127	135	134	71.7	70.1	1	75.0-125	V	V	0.122	20	
ND	0.996	1.01	99.6	101	1	75.0-125	_	_	1.28	20	
ND	1.04	1.05	104	104	1	75.0-125			0.498	20	
0.0204	1.06	1.05	104	103	1	75.0-125			0.325	20	
ND	0.997	1.00	99.7	100	1	75.0-125			0.795	20	
	ND 0.0204	ND 1.04 0.0204 1.06	ND         1.04         1.05           0.0204         1.06         1.05           ND         0.997         1.00	ND         1.04         1.05         104           0.0204         1.06         1.05         104	ND         1.04         1.05         104         104           0.0204         1.06         1.05         104         103           ND         0.997         1.00         99.7         100	ND         1.04         1.05         104         104         1           0.0204         1.06         1.05         104         103         1           ND         0.997         1.00         99.7         100         1	ND         1.04         1.05         104         104         1         75.0-125           0.0204         1.06         1.05         104         103         1         75.0-125           ND         0.997         1.00         99.7         100         1         75.0-125	ND         1.04         1.05         104         104         1         75.0-125           0.0204         1.06         1.05         104         103         1         75.0-125           ND         0.997         1.00         99.7         100         1         75.0-125	ND         1.04         1.05         104         104         1         75.0-125           0.0204         1.06         1.05         104         103         1         75.0-125           ND         0.997         1.00         99.7         100         1         75.0-125	ND         1.04         1.05         104         104         1         75.0-125         0.498           0.0204         1.06         1.05         104         103         1         75.0-125         0.325           ND         0.997         1.00         99.7         100         1         75.0-125         0.795	ND         1.04         1.05         104         104         1         75.0-125         0.498         20           0.0204         1.06         1.05         104         103         1         75.0-125         0.325         20           ND         0.997         1.00         99.7         100         1         75.0-125         0.795         20

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1115520

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PAGE: 24 of 31 Metals (ICPMS) by Method 6020

#### QUALITY CONTROL SUMMARY L1115520-02,03,04,05,06,07,08,09

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#### Method Blank (MB)

(MB) R3428291-1 07/08/19 00:40

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	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Antimony	U		0.000754	0.00200
Arsenic	U		0.000250	0.00200
Lead	U		0.000240	0.00200
Selenium	U		0.000380	0.00200
Thallium	U		0.000190	0.00200

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3428291-2 07/08/	19 00:45 • (LCS	SD) R3428291-	3 07/08/19 00	:49						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony	0.0500	0.0550	0.0552	110	110	80.0-120			0.398	20
Arsenic	0.0500	0.0493	0.0502	98.6	100	80.0-120			1.78	20
Lead	0.0500	0.0476	0.0471	95.2	94.2	80.0-120			1.11	20
Selenium	0.0500	0.0514	0.0504	103	101	80.0-120			1.90	20
Thallium	0.0500	0.0467	0.0466	93.5	93.2	80.0-120			0.268	20

#### L1115292-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115292-01 07/08/1	9 00:54 • (MS) F	23428291-5 07	//08/19 01:03 •	(MSD) R34282	91-6 07/08/19	01:08						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	U	0.0553	0.0549	111	110	1	75.0-125			0.822	20
Arsenic	0.0500	0.00466	0.0513	0.0514	93.3	93.5	1	75.0-125			0.151	20
Lead	0.0500	0.000265	0.0476	0.0478	94.7	95.1	1	75.0-125			0.375	20
Selenium	0.0500	0.00390	0.0547	0.0523	102	96.9	1	75.0-125			4.42	20
Thallium	0.0500	U	0.0469	0.0474	93.9	94.9	1	75.0-125			1.09	20

PROJECT: KCBPU Nearman SDG: L1115520 DATE/TIME: 07/22/19 17:19 PAGE: 25 of 31

Metals (ICPMS) by Method 6020

## QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3432106-1 07/18/19 18:17

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	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Antimony	U		0.000754	0.00200
Arsenic	U		0.000250	0.00200
Lead	U		0.000240	0.00200
Selenium	U		0.000380	0.00200
Thallium	U		0.000190	0.00200

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3432106-2 07/18/	19 18:22 • (LCSE	D) R3432106-3	8 07/18/19 18:26	5						
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Antimony	0.0500	0.0510	0.0513	102	103	80.0-120			0.488	20
Arsenic	0.0500	0.0515	0.0521	103	104	80.0-120			1.17	20
Lead	0.0500	0.0494	0.0519	98.8	104	80.0-120			4.97	20
Selenium	0.0500	0.0522	0.0507	104	101	80.0-120			2.98	20
Thallium	0.0500	0.0483	0.0510	96.6	102	80.0-120			5.44	20

#### L1115520-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115520-01 07/18/19	9 18:31 • (MS) R3	432106-5 07/1	8/19 18:40 • (N	1SD) R3432106	-6 07/18/19 18:	44						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	ND	0.0519	0.0512	104	102	1	75.0-125			1.36	20
Arsenic	0.0500	ND	0.0522	0.0529	102	103	1	75.0-125			1.31	20
Lead	0.0500	ND	0.0503	0.0522	100	104	1	75.0-125			3.77	20
Selenium	0.0500	ND	0.0511	0.0505	102	101	1	75.0-125			1.26	20
Thallium	0.0500	ND	0.0495	0.0506	98.6	101	1	75.0-125			2.16	20

DATE/TIME: 07/22/19 17:19

#### GLOSSARY OF TERMS

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#### Guide to Reading and Understanding Your Laboratory Report

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

#### Abbreviations and Definitions

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.
Т8	Sample(s) received past/too close to holding time expiration.
$\vee$	The sample concentration is too high to evaluate accurate spike recoveries.

# **ACCREDITATIONS & LOCATIONS**

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.

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Alaska	17-026	Nevada
Arizona	AZ0612	New Hampshire
Arkansas	88-0469	New Jersey–NEL
California	2932	New Mexico ¹
Colorado	TN00003	New York
Connecticut	PH-0197	North Carolina
Florida	E87487	North Carolina ¹
Georgia	NELAP	North Carolina ³
Georgia ¹	923	North Dakota
Idaho	TN00003	Ohio-VAP
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylvania
Kansas	E-10277	Rhode Island
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Kentucky ²	16	South Dakota
Louisiana	AI30792	Tennessee ¹⁴
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Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washington
Mississippi	TN00003	West Virginia
Missouri	340	Wisconsin
Montana	CERT0086	Wyoming

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ^{1 4}	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
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#### 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		

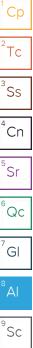
¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

#### **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.







PAGE:

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Kanaga City Daard			Billing Inf	ormation:			L.E.	3.57		Analysis /	Container	/ Preserv	ative		Chair	of Custod	Page of
Kansas City Board of 300 N 65th Street Kansas City, KS 66102	r Public Ui	tilities	300 N 6 Kansas	5th St City, KS 66102		Pres Chk		1.53	/							0	lenter for Testing & Innov
Report to: Ingrid Setzler			Email To: isetzler@	bpu.com;kbrown@	Donn com.ppove	Dhurn					e la				12065	Lebanon Rd	06426
Project Description: GW-Creek Bottom	Ash Pond			City/State Collected:			1								Phone Phone	t Juliet, TN 37 615-758-58 800-767-58 15-758-5859	58
hone: 913-573-9806 ax: 913-573-9838	Client Project			Lab Project # KCKAN02-M	W NEARMAN2	2	mIHDPE-NoPres		res						L#	1110	5520
Collected by (print): Jonathan Hummers	Site/Facility I	-BP	4	P.O. #			HDPE	ONH-3	E-NoPres							# F2	152
Collected by (signature):	Rush? (I	ab MUST Be ay Five I	Notified) Day	Quote #			125	Metals 250mIHDPE-HNO3	250mlHDP						Temp	plate:T10	9043
mmediately Packed on Ice N Y <u>X</u>	Next Da Two Day Three Da		(Rad Only) iy (Rad Only)	Date Resu	Ilts Needed	No. of	Sulfate	ls 250r	pH 250						JAY MARKADON		a Cashman
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	CI, FI,	Meta	TDS, F	-	-		4				dEX Ground
MW-2A /6WOI	Goab	GW	-	7-1-19	1525	3	X	X	X		-				i i i i i i i i i i i i i i i i i i i	emarks	Sample # (lab only
NW-3/6WOI	Goods	GW	-	7643-1-19		3	x	x	x								-01
NW-4/6W01	Georg	GW	-	7-2-19	0945	3	x	x	x				1		1 1 1 1 1 1	and the second s	-02
NW-8A 16-001	Lows	GW	-	7-1-19	1405	3	x	x	x								-03
10/6001	6100	GW		and the second		3	×	×	×			-	-				-04
NW-13 / [WOI	bears	GW	-	72-19	1220	3	x	x	x				-			2012-03	- Off
NW-14 /6001	Gab	GW	-	7-7-19	0840	3	x	X	x	- end							-05
MW-15/6WOt	bents	GW	-	7-1-19		3	x	X	x								-06
WW-16 6001	Brand	GW	-	7-1-19		3	X	X	x						_		-07
DUP-1 60001	bas	GW	-	7-1-19		3	X	X	x				-				-08
Matrix: S - Soil AIR - Air F - Filter W - Groundwater B - Bioassay W - WasteWater W - Drinking Water T - Other	Samples return	ed via:	- C.		RAD SC	REEI	N: <0.	5 mR	/hr	pH		emp		COC Seal COC Sign Bottles Correct Sufficie	ample Rec l Present/ ned/Accura arrive in bottles u ent volume <u>If Ar</u>	<pre>/Intact: ite: itact: ised: sent: oplicable</pre>	NP Y N NP N N N N N N N N N N N N N N N N N
Relinquished by : (Signature)	20	Date: 7-2-10 Date:	1	630 5	eived by: (Signatur	The	w	N		rip Blank F	Received:	Yes / No HCL / M TBR		VOA Zero Preserva	Headspac tion Corr	e:	V N
telinquished by : (Signature)	ex	7-2- Date:	19	1830	eived by: (Signatur			4.3+	38F T.	emp:	SF°C B	ottles Rece 42	ived:	If preserva	ation require	ed by Login	n: Date/Time
					eived for lab by: (S	ignatu				ate: 1/3/19	(10) HOURS	ime: 0800		Hold:	(Carlor)		NCF ON

Kancas City Board of	Dublin I		Billing Int	formation:	1. 19.2.1	T				Analysis / C	Container / Prese	ervative		Chain of Custo	to Days of
Kansas City Board of 300 N 65th Street Kansas City, KS 66102		tilities	300 N 6 Kansas	65th St City, KS 66102	1	Pres Chk	C							$\bigcap$	Page of
Report to: Ingrid Setzler			Email To: isetzler@t	: ^D bpu.com;kbrown@	@bpu.com;bhoy	e@burr								12065 Lebanon R	
Project Description: GW-Creek Bottom A	Ash Pond			City/State Collected:	4 4 7 7 7 7		1			194				Mount Juliet, TN Phone: 615-758-5 Phone: 800-767-5 Fax: 615-758-585	37122 5858 5859
Phone: <b>913-573-9806</b> Fax: <b>913-573-9838</b>	Client Project			Lab Project # KCKAN02-M	W NEARMAN	12	125mlHDPE-NoPres	3	res						5520
Collected by (print): Jonethan Humanse	Site/Facility ID	iD#	Qu	P.O. #			IHDPE	ONH-	E-NoPres					Table #	
Collected by (signature):	Rush? (L	(Lab MUST Be f Day Five D	Notified) Day	Quote #		<u>Sing</u>	100000000000000000000000000000000000000	250mlHDPE-HNO3	SomiHDPI					Acctnum: KC	09043
Immediately Packed on Ice N Y X	Next Day	ay 5 Day	v (Rad Only)	Date Resu	ults Needed	No. of	Sulfate		pH 250n					Prelogin: P70 TSR: 650 - Line	
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	-	Metals	TDS, pl						edEX Ground
DUP-2/6201	Gas	GW	-	7-2-19		3	X	X	×			_		Remarks	Sample # (lab only)
MS-MW-2A/GWOMS	Goub	GW	-	7-1-19	1405	3	X	X	X					HOLD	
MS-D - MW -2A/Gwoims	boab	GW	-	7-1-19	1405	3	X	X	X						-04
MORIVER		GW			1-1-0	3	-	-	×						-04
Floodwater	bras	Gn	-	7-2-19	0825	3	-	X	~			-			(Jart)
	The second se	SW	-	7-2-19	0920	3	XX	XX	× ×					HOLD	
														HOLD	
				pile	Am							-			
						-		7-2	-19					-	
SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Samplas satura	ned via: dEx Courie				SCR	EEN:		mR/hr	pH	Temp Other		COC Signed Bottles an Correct bo	mple Receipt Ch Present/Intact: cd/Accurate: urrive intact: ottles used: t volume sent:	neck/ist NP Y N Y N Y N Y N Y N
Relinquished by : (Signature)		Date: 7-2-19 Date:		me: Rece	cking # ceived by: (Signatur ceived by: (Signatur	A	ul	il		rip Blank Re	TBR	7 Меон	VOA Zero I Preservati	If Applicabl Headspace: ion Correct/Che	scked: $\sum_{n=1}^{N} \sum_{n=1}^{N}$
Relinquished by : (Signature)		2-2-1º	19 18	830		4			АЗОГ- Те .3=4.6	emp: La	F°C Bottles Re		If preservation	ion required by Logi	in: Date/Time
		Jacc.			eived for lab by: (S	(Signatur				ate: 7/3/19	Time: 0800	2	Hold:		Condition:

Alexandra S. Murtaugh



Non Conformance	Login #:L1115520	1
(check annlicable items)	Client:KCKAN02	
	Date:07/03/19	
	Evaluated by:AM	

Chain of custody is incomplete     Insufficient packing material insufe       Please specify Metals requested.     Insufficient packing material inside       Please specify TCLP requested.     Improper handling by carrier (FedEx / UPS / C       Received additional samples not listed on coc.     Sample was       Sample ids on containers do not match ids on     Container lid not intact	t listed on coc. match ids on	t listed on coc. match ids on	t listed on coc. match ids on	match ids on	t listed on coc. match ids on
P requested.     Improper handling by carrier (FedEx / UPS / Courie       al samples not listed on coc.     Sample was       tainers do not match ids on     Container lid not intact	ot listed on coc. ot match ids on				
		is.	sing	sing	sing

# Login Comments: MS/MSD samples are labeled as MW-8A 07/01/19 @1405, but on COC MS/MSD samples are MW-2A with date and time of MW-8A

Cliant informed hu:	Call	X	Email	Voice Mail	Date: 7/3/19	Time: 20:05
Client Informed by	Lan	1	LI I I I I I I I I I I I I I I I I I I			
TSR Initials: SK	Client Con	itact: ]	onathan Ho	rmanson		
Login Instructions:						

The MS/MSD samples are MW-2A, collected 7/1/19 @ 1405, as noted on the CoC. Please follow the CoC for labeling.



# ANALYTICAL REPORT

# Kansas City Board of Public Utilities

Sample Delivery Group:	L1115755
Samples Received:	07/03/2019
Project Number:	62801 BPU Nearman
Description:	groundwater
Site:	NEARMAN-BP9
Report To:	Ingrid Setzler
	300 N 65th Street
	Kansas City, KS 66102

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

# Entire Report Reviewed By:

Stacy Kennedy

Stacy Kennedy 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: 62801 BPU Nearman SDG: L1115755 DATE/TIME: 07/29/19 10:08

PAGE: 1 of 21

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Sr: Sample Results	6	Ss
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MW-3/GW01 L1115755-02	7	Cn
MW-4/GW01 L1115755-03	8	⁵Sr
MW-8A/GW01 L1115755-04	9	
MW-13/GW01 L1115755-05	10	⁶ Qc
MW-14/GW01 L1115755-06	11	7
MW-15/GW01 L1115755-07	12	GI
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SDG: L1115755

DATE/TIME: 07/29/19 10:08

S	SAMPLES	SUMN	IARY		ONE I	AB. NATIONW
MW-2A/GW01 L1115755-01 Non-Potable Water			Collected by Jonathan Hermanson	Collected date/time 07/01/19 15:25	Received da 07/03/19 08	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/21/19 17:11	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-3/GW01 L1115755-02 Non-Potable Water			Jonathan Hermanson	07/01/19 16:45	07/03/19 08	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/21/19 17:11	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-4/GW01 L1115755-03 Non-Potable Water			Jonathan Hermanson	07/02/19 09:45	07/03/19 08	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/21/19 17:11	RGT	Mt. Juliet, TN
MW-8A/GW01 L1115755-04 Non-Potable Water			Collected by Jonathan Hermanson	Collected date/time 07/01/19 14:05	Received da 07/03/19 08	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/21/19 17:11	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-13/GW01 L1115755-05 Non-Potable Water			Jonathan Hermanson	07/02/19 12:20	07/03/19 08	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/23/19 11:00	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/20/19 11:38	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-14/GW01 L1115755-06 Non-Potable Water			Jonathan Hermanson	07/02/19 08:10	07/03/19 08	:00
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/19/19 12:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/20/19 11:38	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/20/19 11:38	RGT	Mt. Juliet, TN

PROJECT: 62801 BPU Nearman SDG: L1115755 DATE/TIME: 07/29/19 10:08 *

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# SAMPLE SUMMARY

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			Collected by	Collected date/time	Received da	te/time
MW-15/GW01 L1115755-07 Non-Potable Water		Jonathan Hermanson07/01/19 12:1507/03/19 08:00DilutionPreparation date/timeAnalysis date/timeAnalysisLocation107/15/19 09:2207/19/19 12:35JMRMt. Juliet, TN5107/18/19 15:1307/20/19 11:38JMRMt. Juliet, TN5107/18/19 15:1307/20/19 11:38RGTMt. Juliet, TNCollected by Jonathan HermansonCollected date/time 07/01/19 09:0007/03/19 08:00DilutionPreparation date/time date/timeAnalysisAnalystLocation107/15/19 09:2207/19/19 12:35JMRMt. Juliet, TN5107/15/19 09:2207/19/19 12:35JMRMt. Juliet, TN				
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/19/19 12:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/20/19 11:38	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/20/19 11:38	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-16/GW01 L1115755-08 Non-Potable Water				07/01/19 09:00	07/03/19 08:	00
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1311371	1	07/15/19 09:22	07/19/19 12:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1313506	1	07/18/19 15:13	07/20/19 11:38	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1313506	1	07/18/19 15:13	07/20/19 11:38	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
DUP-1/GW01 L1115755-09 Non-Potable Water			Jonathan Hermanson	07/01/19 00:00	07/03/19 08:	00

Method Batch Dilution Preparation Analysis Analyst Location date/time date/time Radiochemistry by Method 904 WG1311371 07/15/19 09:22 07/19/19 12:35 Mt. Juliet, TN 1 JMR Radiochemistry by Method Calculation WG1313506 1 07/18/19 15:13 07/20/19 11:38 JMR Mt. Juliet, TN Radiochemistry by Method SM7500Ra B M WG1313506 1 07/18/19 15:13 07/20/19 11:38 RGT Mt. Juliet, TN

SDG: L1115755

# CASE NARRATIVE

*

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.

enned

Stacy Kennedy Project Manager

#### **Project Narrative**

Per attached nonconformance form, MS/MSD containers were initially labeled as MW-2A (as indicated by the chain of custody). Upon receiving updated sample collection information, MS/MSD sample containers were relabeled correctly as MW-8A. MS/MSD analyses were performed on corrected corresponding sample containers of MW-8A. SK 7/19/19

ACCOUNT: Kansas City Board of Public Utilities SDG: L1115755 DATE/TIME: 07/29/19 10:08 ¹ Cp ² Tc ³ Ss ⁴ Cn ⁵ Sr ⁶ Qc ⁷ GI ⁸ Al

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# MW-2A/GW01

# Collected date/time: 07/01/19 15:25

#### SAMPLE RESULTS - 01 L1115755



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# Radiochemistry by Method 904

,	,						L'C
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.140		0.464	0.948	07/23/2019 11:00	WG1311371	Tc
(T) Barium	85.4			62.0-143	07/23/2019 11:00	WG1311371	
(T) Yttrium	87.3			79.0-136	07/23/2019 11:00	WG1311371	³ Ss

# Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.318		0.677	1.24	07/23/2019 11:00	WG1313506	ଁSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.178		0.213	0.293	07/21/2019 17:11	WG1313506
(T) Barium-133	86.3			30.0-143	07/21/2019 17:11	<u>WG1313506</u>

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# Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	1.89		0.563	0.964	07/23/2019 11:00	WG1311371	ŤΤ
(T) Barium	99.5			62.0-143	07/23/2019 11:00	WG1311371	
(T) Yttrium	90.6			79.0-136	07/23/2019 11:00	WG1311371	³ C

## Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	2.07		0.786	1.28	07/23/2019 11:00	WG1313506	ँSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.182		0.223	0.312	07/21/2019 17:11	WG1313506	
(T) Barium-133	82.9			30.0-143	07/21/2019 17:11	WG1313506	

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# Radiochemistry by Method 904

	2 ·						1 Cm
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	1.52		0.404	0.778	07/23/2019 11:00	WG1311371	ŤС
(T) Barium	86.4			62.0-143	07/23/2019 11:00	WG1311371	
(T) Yttrium	90.7			79.0-136	07/23/2019 11:00	WG1311371	³ Sc

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	1.66		0.574	1.01	07/23/2019 11:00	WG1313506	_ Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.142		0.170	0.234	07/21/2019 17:11	WG1313506	
(T) Barium-133	98.1			30.0-143	07/21/2019 17:11	WG1313506	

# MW-8A/GW01

# Collected date/time: 07/01/19 14:05

#### SAMPLE RESULTS - 04 L1115755

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# Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch		
Analyte	pCi/l		+ / -	pCi/l	date / time		-	2
RADIUM-228	0.0157		0.437	0.752	07/23/2019 11:00	WG1311371		ŤΤc
(T) Barium	95.2			62.0-143	07/23/2019 11:00	WG1311371		
(T) Yttrium	93.8			79.0-136	07/23/2019 11:00	WG1311371		³ C c

## Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.107		0.564	0.938	07/23/2019 11:00	WG1313506	ँSr

	Result	Qualifier Uncertaint	ty MDA	Analysis Date	Batch	
Analyte	pCi/l	+ / -	pCi/l	date / time		
RADIUM-226	0.0916	0.127	0.186	07/21/2019 17:11	WG1313506	
(T) Barium-133	90.1		30.0-143	07/21/2019 17:11	WG1313506	

# MW-13/GW01

# Collected date/time: 07/02/19 12:20

#### SAMPLE RESULTS - 05 L1115755



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# Radiochemistry by Method 904

	-						1 Cn
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	1.08		0.423	0.705	07/23/2019 11:00	WG1311371	Tc
(T) Barium	97.8			62.0-143	07/23/2019 11:00	WG1311371	
(T) Yttrium	102			79.0-136	07/23/2019 11:00	WG1311371	³ C c

## Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	1.18		0.567	0.93	07/23/2019 11:00	WG1313506	ँSr

	Result	Qualifier Un	certainty MDA	Analysis Date	Batch	
Analyte	pCi/l	+ /	- pCi/l	date / time		
RADIUM-226	0.0931	0.1	44 0.225	07/20/2019 11:38	WG1313506	
(T) Barium-133	90.7		30.0-1	43 07/20/2019 11:38	WG1313506	

# MW-14/GW01

# Collected date/time: 07/02/19 08:10

# SAMPLE RESULTS - 06



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# Radiochemistry by Method 904

							1 Cm
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.579		0.395	0.669	07/19/2019 12:35	WG1311371	Tc
(T) Barium	91.5			62.0-143	07/19/2019 12:35	WG1311371	
(T) Yttrium	99.2			79.0-136	07/19/2019 12:35	WG1311371	³ Sc

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	C	'n
Analyte	pCi/l		+/-	pCi/l	date / time		5	
Combined Radium	0.690		0.549	0.894	07/20/2019 11:38	WG1313506	ٽS	r

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.112		0.154	0.225	07/20/2019 11:38	WG1313506	
(T) Barium-133	92.0			30.0-143	07/20/2019 11:38	WG1313506	

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## Radiochemistry by Method 904

	2 ·						I Co I
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Ср
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.173		0.371	0.642	07/19/2019 12:35	WG1311371	́Тс
(T) Barium	88.6			62.0-143	07/19/2019 12:35	WG1311371	
(T) Yttrium	100			79.0-136	07/19/2019 12:35	WG1311371	³ Sc

## Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		<u>ج</u>
Combined Radium	0.219		0.602	1.03	07/20/2019 11:38	WG1313506	[°] Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.0466		0.231	0.383	07/20/2019 11:38	WG1313506	
(T) Barium-133	80.5			30.0-143	07/20/2019 11:38	WG1313506	

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# Radiochemistry by Method 904

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	1.37		0.392	0.639	07/19/2019 12:35	WG1311371	ŤΤ
(T) Barium	87.9			62.0-143	07/19/2019 12:35	WG1311371	
(T) Yttrium	95.5			79.0-136	07/19/2019 12:35	WG1311371	³ C

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	1.69		0.628	0.864	07/20/2019 11:38	WG1313506	Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.326		0.236	0.225	07/20/2019 11:38	WG1313506	
(T) Barium-133	88.7			30.0-143	07/20/2019 11:38	WG1313506	

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# Radiochemistry by Method 904

	·						1 Cm
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+ / -	pCi/l	date / time		2
RADIUM-228	0.269		0.448	0.668	07/19/2019 12:35	WG1311371	Tc
(T) Barium	97.4			62.0-143	07/19/2019 12:35	WG1311371	
(T) Yttrium	93.1			79.0-136	07/19/2019 12:35	WG1311371	³ Sc

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.396		0.699	1.04	07/20/2019 11:38	WG1313506	Šr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.127		0.251	0.374	07/20/2019 11:38	WG1313506	
(T) Barium-133	87.8			30.0-143	07/20/2019 11:38	WG1313506	

Radiochemistry by Method 904

## QUALITY CONTROL SUMMARY L1115755-01,02,03,04,05,06,07,08,09

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#### Method Blank (MB)

Method Blank (	IVIB)				
(MB) R3434556-1 07	/23/19 11:00				
	MB Result	MB Qualifier	MB MDA		
Analyte	pCi/l		pCi/l		
Radium-228	0.296		0.504		
(T) Barium	88.5				
(T) Yttrium	88.6				

# L1115755-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1115755-02 07/23/	19 11:00 • (DUP) F	R3434556-5	07/23/19 11	1:00				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-228	1.89	1.25	1	40.3	0.771		20	3
(T) Barium	99.5	93.8						
(T) Yttrium	90.6	91.4						

# Laboratory Control Sample (LCS)

(LCS) R3434556-2 07/2	23/19 11:00				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-228	5.00	4.97	99.5	80.0-120	
(T) Barium			89.7		
(T) Yttrium			86.4		

# L1115755-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115755-04 07/23/19	9 11:00 • (MS) R3	3434556-3 07/	/23/19 11:00 • (l	MSD) R343455	6-4 07/23/191	1:00							
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.0157	10.8	11.0	108	110	1	70.0-130			1.65		20
(T) Barium		95.2			101	103							
(T) Yttrium		93.8			84.9	91.2							

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	62801 BPU Nearman	L1115755	07/29/19 10:08	15 of 21

Radiochemistry by Method SM7500Ra B M

#### QUALITY CONTROL SUMMARY L1115755-01,02,03,04,05,06,07,08,09

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## Method Blank (MB)

Method Didlik (	IVID)			
(MB) R3432866-1 07	7/21/19 17:11			
	MB Result	MB Qualifier	MB MDA	
Analyte	pCi/l		pCi/l	
Radium-226	0.0483		0.0716	
(T) Barium-133	80.0			

# L1119502-01 Original Sample (OS) • Duplicate (DUP)

#### (OS) L1119502-01 07/20/19 11:38 • (DUP) R3432866-5 07/21/19 17:11

	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-226	1.02	1.15	1	11.6	0.209		20	3
(T) Barium-133	96.4	90.7						

# Laboratory Control Sample (LCS)

(LCS) R3432866-2 07	//21/19 17:11				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.67	113	80.0-120	
(T) Barium-133			90.8		

# L1115755-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115755-04 07/21/19 17:11 • (MS) R3432866-3 07/21/19 17:11 • (MSD) R3432866-4 07/21/19 17:11													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.0916	19.5	21.3	96.7	105	1	75.0-125			8.67		20
(T) Barium-133		90.1			91.4	86.0							

DATE/TIME: 07/29/19 10:08

# GLOSSARY OF TERMS

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# 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.

SDG: L1115755

# **ACCREDITATIONS & LOCATIONS**

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
Alaska	17-026	Nevada
Arizona	AZ0612	New Ham
Arkansas	88-0469	New Jers
California	2932	New Mex
Colorado	TN00003	New York
Connecticut	PH-0197	North Car
Florida	E87487	North Car
Georgia	NELAP	North Car
Georgia ¹	923	North Dal
Idaho	TN00003	Ohio–VAF
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylva
Kansas	E-10277	Rhode Isl
Kentucky 16	90010	South Car
Kentucky ²	16	South Dal
Louisiana	AI30792	Tennesse
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washingt
Mississippi	TN00003	West Virg
Missouri	340	Wisconsir
Montana	CERT0086	Wyoming

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ^{1 4}	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
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**

Kansas City Board of Public Utilities

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.



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07/29/19 10:08

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eport to: grid Setzle			ale de	Email To: isetzler@bpu.com;kbrown@bpu.com;bhoye@burn									12065 Lebanon Rd Mount Juliet, TN 371: Phone: 615-758-5858 Phone: 800-767-5859			
roject					City/State Collected:				15				Fax: 615-758-5859	122 122		
none: <b>913-5</b>	73-9806	Client Project # 62801 BPU I			KCKAN02-MV	W NEARMAN		GH-11					F246	and the second		
uneted by (n	rint): Nev Heschensen	Site/Facility ID # Dearman-BPU		Site/Facility ID #		,pu	P.O. #	.0. #		RA228					Acctnum: KCK	
billected by (s	d by (signature): Rush? (Lab MUST		b MUST Be	Notified) Day	Quote #	ults Needed		RA226,					Prelogin: <b>P708</b> TSR: <b>650 - Linda</b>	150		
nmediately packed on Ice	ыд <u>N_Y_</u>	Two Day	10 D	ay (Rad Only)	1	1	No. of Cntrs	Rad,					PB: Shipped Via: <b>Fe</b>	1		
	Sample ID	Comp/Grab	Matrix *	Depth	Date	Time		Tota	5.2				Remarks	Sample # (lab onl		
MW-2A	busi	Geals	NPW	-	7-1-19	1525	3	X						-01		
	SWOI	Geas	NPW	1	7-1-19	1645	3	X						03		
	6000	lacus	NPW	-	7-2-19	0945	3	X	124					04		
MW-8A	60001	Geob	NPW	-	7-1-19	1405	3	X						- 7		
MW-10			NPW				3						A CONTRACTOR OF	05		
MW-13	6401	Georg	NPW	1 The second	7-2-19	1230	3	X	1					00		
MW-14	10001	beab	NPW	1.75	7-2-19	0810	3	X						07		
MW-15	(GNOI	beab	NPW	-	7-1-19	the second second second second second second	3							08		
MW-16	16201	Gab	NPW	-	7-1-14		3	X X					and the second	Og		
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay		George Remarks:		NPW - 7-1-19					PH Temp Flow Other				Sample Receipt Checklist COC Seal Present/Intact: NP COC Signed/Accurate: Bottles arrive intact: Correct bottles used:			
		Samples retu	es returned via: S FedEx Courier >SVA Tracking #					<u></u>	1.	Trip Blank B	Received: Yes/😡	VOA Z	Sufficient volume sent: If Applicable VOA Zero Headspace: Preservation Correct/Checked:			
Relinquished	by : (Signature)	2144	Date:	19	Time: Received by: (Signa			A	m		HCL / Me TBR °C Bottles Receive		ervation required by Lo	ogin: Date/Time		
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Kansas City Board of F	Public Uti	lities	Attn: Elle 300 N 65	en Bouse		Pres Chk	12								Printernal Center	for Testing & Innovation
100 N 🗩 5th Street Kansas City, KS 66102			Kansas City, KS 66102				03									
Report to: Ingrid Setzler	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Email To: isetzler@b	pu.com;kbrown@l	@burn	EONH PPP							1	2065 Lebanon Rd Mount Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859		
Project Description: groundwater			Alaria	City/State Collected:	in fil		DPE-A0							1.24	Fax: 615-758-5859	99.2 (2)
Phone: 913-573-9806	Client Project			Lab Project # KCKAN02-MV	V NEARMAN	1	11-H							-	Table #	
Fax: Collected by (print): Donathan Harmans	Site/Facility ID	#	RPA	P.O. #			,RA228							1000	Acctnum: KCKA	
Collected by (signature):	Rush? (L	ab MUST Be	Notified)	Quote #			A226,F								Template: <b>T150051</b> Prelogin: <b>P708150</b>	
Immediately NIA Packed on Ice N Y	Next Day Two Day Three D	y5 Da	y (Rad Only) ay (Rad Only)	Date Resu	ilts Needed	No. of	Rad, RA226,								TSR: 650 - Linda PB: Shipped Via: Feo	
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	Tota								Remarks	Sample # (lab only)
DUP-2 6001	bears	NPW	-	7-2-19	-	3	X	192								10
mw-24/buoins	bears	NPN	-	7-1-19	1405	3	X				-					01
MIN-DAIGWOIMSO	Genb	NPW	-	7-1-19	1405	3	X	-						1		01
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Fleodnaler 2	6000	New	1	7-2-101	6000	3	×					in the second				16
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		Contraction of		A A SAME	14.5		V	2-1	2		1.1.1					
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Remarks:							CREEN: <0.5 mR/hr						Sample Receipt Checklist C Seal Present/Intact: NP C Signed/Accurate: ttles arrive intact: rrect bottles used:		
DW - Drinking Water OT - Other	Samples retu	irned via: edExC	ourier SV		racking #		A	ž		Blank Re	ceived:	Yes/Na)	VOA Ze	ero He	volume sent: <u>If Applicabl</u> adspace: on Correct/Che	Y N
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Pace Analytical ® National Center for Testing & Innovation

CC/CTTTT:# UIDOT		
ice (check	applicable items)	
Sample Integrity	Chain of Custody Clarification	
Parameter(s) past holding time	Login Clarification Needed	If Broken Container:
Temperature not in	Chain of custody is incomplete	Insufficient packing material around container
Improper container	Please specify Metals requested.	cooler
type	Please specify TCLP requested.	Improper handling by carrier (FedEx / UPS / Courier
pH not in range.	Received additional samples not listed on coc.	Sample was frozen
Insufficient sample volume. Sample is biphasic.	Sample ids on containers do not match ids on	Container lid not intact
······································	1	If no Chain of Custody:
Vials received with meanspace	1	Received by:
Broken container	Chain of Custody is missing	Date/Time:
Broken container:		Temp./Cont. Rec./pH:
Sufficient sample remains		Carrier:
		Tracking#

# Login Comments: The only MW-8A samples we received have MW-8A/GW received the MW-2A/GW01 MS/MSD and the parent containers as well

Time: 20:16	]	Initials: SK Client Contact: Jonathan Hermanson
and the second	Client inforn	TSR Initials:

Please disregard the "MS" label on the MW-8A bottles. Only MW-2A should have MS bottles. Please follow the CoC for correct labeling.



# ANALYTICAL REPORT

# Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1116030 07/06/2019 KCBPU Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Tacy Kennedy

Stacy Kennedy Project Manager

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

ACCOUNT: Kansas City Board of Public Utilities PROJECT: KCBPU Nearman SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 1 of 16

²Tc ³Ss ⁴Cn ⁵Sr ⁶Qc ⁷Gl ⁸Al ⁹Sc

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SDG: L1116030

# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

MW-10/GW01 L1116030-01 GW			Collected by Jonathan Hermanson	Collected date/time 07/03/19 10:05	Received da 07/06/19 08:	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1308068	1	07/09/19 12:05	07/09/19 13:34	AEC	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1307663	1	07/08/19 11:48	07/08/19 11:48	ANP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1310272	1	07/12/19 16:44	07/12/19 16:44	LDC	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1310272	5	07/13/19 08:47	07/13/19 08:47	LDC	Mt. Juliet, TN
Mercury by Method 7470A	WG1307472	1	07/08/19 11:39	07/08/19 21:54	TCT	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1308004	1	07/09/19 09:38	07/10/19 00:37	CCE	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1307618	1	07/07/19 22:44	07/08/19 14:18	JPD	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1307618	1	07/07/19 22:44	07/08/19 15:16	JPD	Mt. Juliet, TN

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SDG: L1116030

# CASE NARRATIVE

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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.

enned

Stacy Kennedy Project Manager

Τс Ss Cn Sr Qc GI AI Sc

SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 4 of 16

#### SAMPLE RESULTS - 01 L1116030



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# Gravimetric Analysis by Method 2540 C-2011

	, ,							10
		Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte		mg/l		mg/l		date / time		 2
Dissolved Solids		441		10.0	1	07/09/2019 13:34	WG1308068	T

# Wet Chemistry by Method 9040C

	Result	Qualifier	RDL	Dilution	Analysis	Batch	——————————————————————————————————————
Analyte	mg/l	quanto	mg/l	Dilation	date / time		2
Dissolved Solids	441		10.0	1	07/09/2019 13:34	WG1308068	² Tc
Wet Chemistry by	Method 90400	C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	SU			date / time			4 Cr
pН	7.47	<u>T8</u>	1	07/08/2019 11:48	3 WG1307663		

#### Sample Narrative:

L1116030-01 WG1307663: 7.47 at 16.7C

## Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ Gl
Analyte	mg/l		mg/l		date / time		G
Chloride	11.3		1.00	1	07/12/2019 16:44	WG1310272	8
Fluoride	0.260		0.100	1	07/12/2019 16:44	WG1310272	ĬAĬ
Sulfate	104		25.0	5	07/13/2019 08:47	WG1310272	
							⁹ Sc

#### Mercury by Method 7470A

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Mercury	ND		0.000200	1	07/08/2019 21:54	WG1307472

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0725		0.00500	1	07/10/2019 00:37	WG1308004
Beryllium	ND		0.00200	1	07/10/2019 00:37	WG1308004
Boron	ND		0.200	1	07/10/2019 00:37	WG1308004
Cadmium	ND		0.00200	1	07/10/2019 00:37	<u>WG1308004</u>
Calcium	101		1.00	1	07/10/2019 00:37	WG1308004
Chromium	ND		0.0100	1	07/10/2019 00:37	<u>WG1308004</u>
Cobalt	ND		0.0100	1	07/10/2019 00:37	WG1308004
Lithium	0.0165		0.0150	1	07/10/2019 00:37	WG1308004
Molybdenum	ND		0.00500	1	07/10/2019 00:37	WG1308004

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Antimony	ND		0.00200	1	07/08/2019 15:16	WG1307618
Arsenic	0.00228		0.00200	1	07/08/2019 14:18	WG1307618
Lead	ND		0.00200	1	07/08/2019 14:18	WG1307618
Selenium	0.00922		0.00200	1	07/08/2019 14:18	WG1307618
Thallium	ND		0.00200	1	07/08/2019 14:18	WG1307618

SDG: L1116030

# WG1308068

Gravimetric Analysis by Method 2540 C-2011

# QUALITY CONTROL SUMMARY

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## Method Blank (MB)

(MB) R3429495-1 07/09/19 13:34					
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Dissolved Solids	U		2.82	10.0	

## L1114054-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1114054-10 07/09/1	19 13:34 • (DUP) F	23429495-3	07/09/19 13	3:34		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	988	993	1	0.505		5

# Laboratory Control Sample (LCS)

(LCS) R3429495-2 C	07/09/19 13:34				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8910	101	85.0-115	

SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 6 of 16

# WG1307663

Wet Chemistry by Method 9040C

# QUALITY CONTROL SUMMARY L1116030-01

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# L1115954-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1115954-01 07/08	3/19 11:48 • (DUP) F	, 3428422-2 (	07/08/19 1′	l:48		
	Original Result	DUP Result	Dilution	DUP RPD DU	UP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	8.24	8.25	1	0.121		1
Sample Narrative:						
OS: 8.24 at 16.1C						

DUP: 8.25 at 15.5C

# L1116134-02 Original Sample (OS) • Duplicate (DUP)

#### (OS) L1116134-02 07/08/19 11:48 • (DUP) R3428422-3 07/08/19 11:48 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 9.39 9.37 1 0.213 1 Sample Narrative: OS: 9.39 at 13C DUP: 9.37 at 14.9C

# Laboratory Control Sample (LCS)

(LCS) R3428422-1 07/08	/19 11:48				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
рН	10.0	9.99	99.9	99.0-101	

#### Sample Narrative:

LCS: 9.99 at 22.4C

DATE/TIME: 07/15/19 16:50

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#### Wet Chemistry by Method 9056A

# QUALITY CONTROL SUMMARY L1116030-01

ONE LAB. NATIONWIDE.

Method Blank (MB)

(MB) R3430294-1	07/12/19 09:34	
	MB Result	MB Qualifier

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Chloride	U		0.0519	1.00
Fluoride	U		0.00990	0.100
Sulfate	0.178	J	0.0774	5.00

# L1116030-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1116030-01 07/12/19	DS) L1116030-01 07/12/19 16:44 • (DUP) R3430294-3 07/12/19 16:59										
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits					
Analyte	mg/l	mg/l		%		%					
Chloride	11.3	11.4	1	0.980		15					
Fluoride	0.260	0.259	1	0.386		15					

# L1117644-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1117644-07 07/12/19 20:57 • (DUP) R3430294-6 07/12/19 21:12

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	2.10	2.12	1	0.830		15
Fluoride	0.138	0.138	1	0.145		15
Sulfate	49.2	49.0	1	0.350		15

# L1116030-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1116030-01 07/13/19	OS) L1116030-01 07/13/19 08:47 • (DUP) R3430294-8 07/13/19 09:02								
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits			
Analyte	mg/l	mg/l		%		%			
Sulfate	104	105	5	0.479		15			

# Laboratory Control Sample (LCS)

(LCS) R3430294-2 07/1	_CS) R3430294-2 07/12/19 09:49								
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier				
Analyte	mg/l	mg/l	%	%					
Chloride	40.0	39.2	98.0	80.0-120					
Fluoride	8.00	8.19	102	80.0-120					
Sulfate	40.0	41.2	103	80.0-120					

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Wet Chemistry by Method 9056A

# QUALITY CONTROL SUMMARY

# L1116030-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116030-01 07/12/19 16:44 • (MS) R3430294-4 07/12/19 17:14 • (MSD) R3430294-5 07/12/19 17:29												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	50.0	11.3	61.6	61.6	101	100	1	80.0-120			0.0690	15
Fluoride	5.00	0.260	5.29	5.30	101	101	1	80.0-120			0.0548	15

# L1117644-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1117644-07 07/12/19	OS) L1117644-07 07/12/19 20:57 • (MS) R3430294-7 07/12/19 21:27										
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier				
Analyte	mg/l	mg/l	mg/l	%		%					
Chloride	50.0	2.10	52.6	101	1	80.0-120					
Fluoride	5.00	0.138	5.16	101	1	80.0-120					

SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 9 of 16 Sc

# WG1307472

Mercury by Method 7470A

# QUALITY CONTROL SUMMARY

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# Method Blank (MB)

(MB) R3428657-1 07/0	08/19 21:27				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Mercury	U		0.0000490	0.000200	

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3428657-2 07/08/19 21:29 • (LCSD) R3428657-3 07/08/19 21:36										
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Mercury	0.00300	0.00296	0.00290	98.8	96.6	80.0-120			2.28	20

# L1115982-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115982-02 07/08/19 21:38 • (MS) R3428657-4 07/08/19 21:40 • (MSD) R3428657-5 07/08/19 21:43												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%

# WG1308004

Metals (ICP) by Method 6010B

# QUALITY CONTROL SUMMARY L1116030-01

# Method Blank (MB)

(MB) R3429131-1	07/10/19 03:00

. ,				
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.00170	0.00500
Beryllium	U		0.000700	0.00200
Boron	U		0.0126	0.200
Cadmium	U		0.000700	0.00200
Calcium	U		0.0463	1.00
Chromium	U		0.00140	0.0100
Cobalt	U		0.00230	0.0100
Lithium	U		0.00530	0.0150
Molybdenum	U		0.00160	0.00500

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3429131-2 07/10/19 03:03 • (LCSD) R3429131-3 07/10/19 03:06										
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Barium	1.00	1.02	1.01	102	101	80.0-120			0.834	20
Beryllium	1.00	0.969	0.964	96.9	96.4	80.0-120			0.520	20
Boron	1.00	0.991	0.975	99.1	97.5	80.0-120			1.59	20
Cadmium	1.00	0.978	0.969	97.8	96.9	80.0-120			0.855	20
Calcium	10.0	9.51	9.32	95.1	93.2	80.0-120			1.95	20
Chromium	1.00	0.937	0.926	93.7	92.6	80.0-120			1.20	20
Cobalt	1.00	0.988	0.979	98.8	97.9	80.0-120			0.874	20
Lithium	1.00	0.949	0.937	94.9	93.7	80.0-120			1.28	20
Molybdenum	1.00	0.982	0.983	98.2	98.3	80.0-120			0.0590	20

# L1115918-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Barium	1.00	0.637	1.60	1.60	96.6	96.7	1	75.0-125			0.0601	20
Beryllium	1.00	ND	0.972	0.975	97.2	97.5	1	75.0-125			0.365	20
Boron	1.00	ND	1.06	1.07	99.1	100	1	75.0-125			1.16	20
Cadmium	1.00	ND	1.01	1.01	101	101	1	75.0-125			0.257	20
Calcium	10.0	612	605	607	0.000	0.000	1	75.0-125	$\underline{\vee}$	$\underline{\vee}$	0.238	20
Chromium	1.00	0.0139	0.923	0.935	90.9	92.2	1	75.0-125			1.37	20
Cobalt	1.00	0.0160	1.03	1.03	101	102	1	75.0-125			0.593	20
₋ithium	1.00	ND	0.975	0.981	96.2	96.8	1	75.0-125			0.559	20
Nolybdenum	1.00	ND	0.979	0.976	97.8	97.4	1	75.0-125			0.352	20

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#### WG1307618

Metals (ICPMS) by Method 6020

# QUALITY CONTROL SUMMARY

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#### Method Blank (MB)

(MB) R3428560-1 07/08	/19 13:51				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Antimony	U		0.000754	0.00200	

#### Method Blank (MB)

(MB) R3428572-1	07/08/19	11:04	

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Arsenic	U		0.000250	0.00200
Lead	U		0.000240	0.00200
Selenium	U		0.000380	0.00200
Thallium	U		0.000190	0.00200

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3428560-2 0	7/08/19 13:56 • (LCS	SD) R3428560	)-3 07/08/19 14	:01							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	9
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%	
Antimony	0.0500	0.0484	0.0492	96.9	98.4	80.0-120			1.51	20	

#### Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Arsenic	0.0500	0.0501	0.0504	100	101	80.0-120			0.665	20
Lead	0.0500	0.0515	0.0494	103	98.8	80.0-120			4.24	20
Selenium	0.0500	0.0504	0.0510	101	102	80.0-120			1.09	20
Thallium	0.0500	0.0501	0.0500	100	100	80.0-120			0.244	20

#### L1115109-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115109-05 07/08/1	DS) L1115109-05 07/08/19 14:05 • (MS) R3428560-5 07/08/19 14:14 • (MSD) R3428560-6 07/08/19 14:19											
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Antimony	0.0500	U	0.0519	0.0503	104	101	1	75.0-125			3.32	20

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Metals (ICPMS) by Method 6020

# QUALITY CONTROL SUMMARY

## L1115109-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1115109-05 07/08/1	9 11:20 • (MS) R3	3428572-5 07	/08/19 11:31 • (I	MSD) R342857	2-6 07/08/191	11:36						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Arsenic	0.0500	0.000331	0.0515	0.0504	102	100	1	75.0-125			2.23	20
Lead	0.0500	0.000266	0.0498	0.0499	99.1	99.2	1	75.0-125			0.176	20
Selenium	0.0500	U	0.0504	0.0496	101	99.2	1	75.0-125			1.63	20
Thallium	0.0500	U	0.0503	0.0497	101	99.4	1	75.0-125			1.12	20

SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 13 of 16

# GLOSSARY OF TERMS

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#### Guide to Reading and Understanding Your Laboratory Report

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

#### Abbreviations and Definitions

ADDIEVIALIONS and	
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

adamer	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

PROJECT: KCBPU Nearman SDG: L1116030 DATE/TIME: 07/15/19 16:50 PAGE: 14 of 16

# **ACCREDITATIONS & LOCATIONS**

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
Alaska	17-026	Nevada
Arizona	AZ0612	New Hampshire
Arkansas	88-0469	New Jersey–NEI
California	2932	New Mexico ¹
Colorado	TN00003	New York
Connecticut	PH-0197	North Carolina
Florida	E87487	North Carolina ¹
Georgia	NELAP	North Carolina ³
Georgia ¹	923	North Dakota
Idaho	TN00003	Ohio-VAP
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylvania
Kansas	E-10277	Rhode Island
Kentucky 16	90010	South Carolina
Kentucky ²	16	South Dakota
Louisiana	AI30792	Tennessee ¹⁴
Louisiana 1	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washington
Mississippi	TN00003	West Virginia
Missouri	340	Wisconsin
Montana	CERT0086	Wyoming
		, , ,

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ¹⁴	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
	Δ2Ι Δ

#### 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**

Kansas City Board of Public Utilities

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Cansas City Board of P 100 N 65th Street Cansas City, KS 66102	Public Util	ities	300 N 65			Pres Chk		42								Retioned Cent	er for Testing & Innovation
ngrid Setzler	4		Email To: isetzler@b	pu.com;kbrown@	bpu.com;bhoye	e@burn									A P F	2065 Lebanon Rd Mount Juliet, TN 371 Phone: 615-758-5858 Phone: 800-767-5859	进行行
Project Description: GW-Creek Bottom A	sh Pond			City/State Collected:			Pres								F	ax: 615-758-5859	6.30
Phone: <b>913-573-9806</b> Fax: <b>913-573-9838</b>	Client Project # KCBPU Near			KCKAN02-M	W NEARMAN	N2	PE-No	103	oPres						1	HO	
Collected by (print): Jonuthun Kanans	Site/Facility ID	# orma	n-Bp	P.O. #			5mlHDPE-NoPres	PE-HN	DPE-N							Acctnum: KCK	
Collected by (signature):	Rush? (La	b MUST Be y Five 5 Da 10 D	Notified)	Quote #	ults Needed	No. of	Sulfate 12	Metals 250mlHDPE-HNO3	pH 250mlHDPE-NoPres				A			Prelogin: <b>P71</b> 4 TSR: <b>650 - Lind</b> PB:	4607
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntr	CI, FI,	Meta	TDS,						22	Remarks	Sample # (lab only
MW-10/6W01	600	GW	-	7-3-19	1005	3		X	X				-				- 01
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		GW	1.1	- <u> </u>	<u></u>	3	X	X	X	1						- 6.	
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	Remarks:						4								Samp	ple Receipt ( resent/Intac	Checklist t: NP Y
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay	Nethal K3.									pH _ Flow		ther		COC S Bottl Corre	les ar: ect bo	/Accurate: rive intact: ttles used:	
WW - WasteWater DW - Drinking Water OT - Other	Samples retu	rned via: edExC	ourier		Tracking # 4		16	161	8	764	k Received:	Yes //N	2	VOA Z	Zero H	volume sent If Applica eadspace:	<u>ble</u> _Y_
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Relinquished by : (Signature)		Date:	5-19	Time:			10			Temp: 5.7 Date:	1= 5.65	Time:	2	Hold:			Condition
Relinquished by : (Signature)		Date:		Ťime:	Received for la	The A	shature)	-		7161	119	084	5				NCF 10



# ANALYTICAL REPORT

#### Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1116033 07/06/2019 62801 BPU Nearman groundwater

Report To:

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

#### Entire Report Reviewed By:

Tacy Kenned

Stacy Kennedy 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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: 62801 BPU Nearman SDG: L1116033 DATE/TIME: 08/02/19 15:03

PAGE: 1 of 10

¹Cp ²Tc ³Ss ⁴Cn ⁵Sr ⁶Qc ⁷Gl ⁸Al ⁹Sc

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SDG: L1116033 DATE/TIME: 08/02/19 15:03

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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.

			Collected by	Collected date/time	Received da	te/time
MW-10/GW01 L1116033-01 Non-Potable Water			Jonathan Hermanson	07/03/19 10:05	07/06/19 08:	45
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1312590	1	07/17/19 08:59	07/22/19 11:30	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1319160	1	07/29/19 14:22	07/30/19 17:15	RGT	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1319160	1	07/29/19 14:22	07/30/19 17:15	RGT	Mt. Juliet, TN

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ACCOUNT:
Kansas City Board of Public Utilities

SDG: L1116033 DATE/TIME: 08/02/19 15:03

#### CASE NARRATIVE

*

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.

enned

Stacy Kennedy Project Manager



SDG: L1116033 DATE/TIME: 08/02/19 15:03 PAGE:

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# MW-10/GW01

# Collected date/time: 07/03/19 10:05

#### SAMPLE RESULTS - 01 L1116033



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#### Radiochemistry by Method 904

,	<i>,</i>						l'Cn
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.127		0.482	0.943	07/22/2019 11:30	WG1312590	Tc
(T) Barium	93.2			62.0-143	07/22/2019 11:30	WG1312590	
(T) Yttrium	84.4			79.0-136	07/22/2019 11:30	WG1312590	³ Cc

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.414		0.690	1.14	07/30/2019 17:15	WG1319160	ँSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.288		0.208	0.198	07/30/2019 17:15	<u>WG1319160</u>	
(T) Barium-133	93.5			30.0-143	07/30/2019 17:15	WG1319160	

#### Radiochemistry by Method 904

#### QUALITY CONTROL SUMMARY L1116033-01

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#### Method Blank (MB)

(MB) R3433172-1 07	7/22/19 11:30		
	MB Result MB Qualifier	MB MDA	
Analyte	pCi/l	pCi/l	
Radium-228	0.0106	0.484	
(T) Barium	89.9		
(T) Yttrium	92.6		

#### L1118931-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1118931-01 07/22/1	19 14:35 • (DUP) R	3433172-5 0	7/22/19 11:3	30				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-228	1.87	0.984	1	62.1	0.987		20	3
(T) Barium	99.4	94.6						
(T) Yttrium	97.0	83.0						

#### Laboratory Control Sample (LCS)

(LCS) R3433172-2 07	/22/19 11:30				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-228	5.00	5.22	104	80.0-120	
(T) Barium			96.8		
(T) Yttrium			88.1		

#### L1116037-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1116037-01 07/22/19 11:30 • (MS) R3433172-3 07/22/19 11:30 • (MSD) R3433172-4 07/22/19 11:30													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	7.14	1.38	8.64	8.52	102	100	1	70.0-130			1.36		20
(T) Barium		102			101	94.3							
(T) Yttrium		80.8			91.8	88.7							

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#### Radiochemistry by Method SM7500Ra B M

#### QUALITY CONTROL SUMMARY L1116033-01

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#### Method Blank (MB)

(MB) R3436250-5 07/31/19 19:57						
MB Result	MB Qualifier	/IB MDA				
pCi/l		oCi/l				
0.0326		0.0442				
98.3						
	7/31/19 19:57 MB Result pCi/l 0.0326	r/31/19 19:57 MB Result <u>MB Qualifier</u> M pCi/l p	MB Result         MB Qualifier         MB MDA           pCi/l         pCi/l         0.0326         0.0442	MB Result         MB Qualifier         MB MDA           pCi/l         pCi/l         0.0326         0.0442		

#### L1123252-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1123252-02 07/	/31/19 06:45 • (DUP)	R3436250-4	07/30/19	17:15				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-226	0.584	0.464	1	22.9	0.295		20	3
(T) Barium-133	101	95.2						

#### Laboratory Control Sample (LCS)

(LCS) R3436250-1 07/3	80/19 17:15				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-226	5.02	4.98	99.3	80.0-120	
(T) Barium-133			95.5		

#### L1123252-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1123252-01 07/31/19 10:45 • (MS) R3436250-2 07/30/19 17:15 • (MSD) R3436250-3 07/30/19 17:15													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.633	17.8	19.2	85.3	92.4	1	75.0-125			7.74		20
(T) Barium-133		105			98.0	93.8							

DATE/TIME: 08/02/19 15:03

# GLOSSARY OF TERMS

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#### 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.
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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.

SDG: L1116033

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Alaska	17-026	Nevada
Arizona	AZ0612	New Ham
Arkansas	88-0469	New Jerse
California	2932	New Mexi
Colorado	TN00003	New York
Connecticut	PH-0197	North Car
Florida	E87487	North Car
Georgia	NELAP	North Car
Georgia ¹	923	North Dak
Idaho	TN00003	Ohio–VAF
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylva
Kansas	E-10277	Rhode Isla
Kentucky ¹⁶	90010	South Car
Kentucky ²	16	South Dak
Louisiana	AI30792	Tennesse
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washingto
Mississippi	TN00003	West Virg
Missouri	340	Wisconsin
Montana	CERT0086	Wyoming

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey–NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee 14	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
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**

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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.



62801 BPU Nearman

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INSAS City Board of F				65th Street											- Reitonel C	enter for Tealing & Innovation
rt to: id Setzler Email To: isetzler@b			ppu.com;kbrown@	e@burn	ONH PP								12065 Lebanon Rd Mount Juliet, TN 37 Phone: 615-758-58 Phone: 800-767-58	7122 58		
ject scription: groundwater			City/State Collected:		-	DPE-Add								Fax: 615-758-5859		
one: <b>913-573-9806</b> c	Client Project # 62801 BPU Nearman			KCKAN02-M	W NEARMAN	4	1L-H								HO2	
lected by (print):	Site/Facility ID # Nevenue - BPa			P.O. #			6,RA228								Acctnum: KCI	
ilected by (signature):	Rush? (Lab MUST Be Notified)			Quote #			A226,								Template: <b>T1</b> Prelogin: <b>P71</b> TSR: <b>650</b> - Line	L4606
mediately toked on Ice N Y	Next Day Two Day Three Da	y5 Da 10 D	y (Rad Only) ay (Rad Only)	esults Needed		Rad, RA22								PB:	edEX Ground	
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atter and a second	6					-		7-	3-19							
Matrix: SS - Soil AIR - Air F - Filter SW - Groundwater B - Bioassay				- 1		<u> </u>		pH	0.5	emp	- CO Bo	C Signe ttles a	I Present/Intac d/Accurate: rrive intact: ottles used:	_ <u>Z</u> Y _1		
WW - WasteWater DW - Drinking Water OT - OtherUPS		rned via: edExCo	ourier	1	Tracking #	510		1661		764		0	Su VO	fficien A Zero	t volume sent If Applica Headspace:	
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Refinquished by : (Signature)	LED -	Date:		Time:	Received by: (Sig	nature	, and		1	^{Гетр:} 5.7	°C	Bottles Recei	ved: If p	preservat	ion required by L	.ogin: Date/Time
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# Memorandum



Date:	January 3, 2020
То:	Brian Hoye
From:	Shauna Lawrence
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 – November 2019 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 November 26, 2019. All noted samples were submitted to Pace Analytical National Center for Testing & Innovation of Mount Juliet, Tennessee (Pace) (formerly known as ESC Lab Sciences) for analysis by one or more of the following methods:

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

Notes:

¹Metals performed by SW-846 6010B include total barium, boron, calcium, lithium, molybdenum, and selenium. Metals performed by SW-846 6020 include total arsenic.

²Project 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. <u>Chain-of-Custody (COC)</u> The relinquished and received signatures, times, and dates on the COCs were present.
- 2. <u>Requested Analyses Completed</u> All analyses were completed as requested for the appropriate parameters for the November groundwater sampling event.
- 3. <u>Holding Times</u> 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.

# Memorandum (continued)



January 3, 2020 Page 2

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

- 4. <u>Sample Preservation</u> All samples were received by the laboratory slightly below the recommended 2 to 6 degrees Celsius (°C) sample preservation temperature range. Because no samples were received frozen, all were considered viable.
- 5. <u>Laboratory Method Blanks</u> 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:
  - Calcium (0.137 mg/L) was detected in the method blank in batch WG1388682. All associated samples exhibited calcium concentrations greater than five times this blank detection. As such, cross-contamination was not a concern, and no data qualifiers were added.
  - Radium-226 (-0.00470 pCi/L) and radium-228 (-0.305 pCi/L) were detected in the method blanks in batches WG1394619 and WG1397762, respectively. Because both of these method blank detections exhibited negative results, they were considered non detect. No samples were qualified based on these method blank results.
- 6. <u>Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)</u> 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. <u>Matrix Spike/Matrix Spike Duplicates (MS/MSD)</u> 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-8A: 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.

# Memorandum (continued)



January 3, 2020 Page 3

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

- 8. <u>Laboratory Duplicate Results</u> 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. <u>Field Duplicate Results</u> 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 during each sampling event: MW-2A and DUP-1. Table 2 presents a side-by-side comparison of the field duplicate results. All results were adequately replicated for this field duplicate pair.

- 10. <u>Detection and Quantitation Limits</u> The sulfate for one or more samples required a dilution to account for high concentrations and/or matrix interferences. Qualifiers were not necessary based on these dilutions.
- 11. <u>Conclusion</u> 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 QualifiersTable 2: Field Duplicate Results

# Table 1Data QualifiersKansas City Board of Public Utilities (BPU) - Kansas City, KansasNearman Creek Power Station Bottom Ash Pond – November 2019

Sample Identification	Laboratory Number	Parameter(s)	Data Qualifier	Reason for Qualification
MW-2A MW-3 MW-4 MW-8A MW-10 MW-13 MW-14 MW-15 MW-16 DUP-1	L1165504-01 L1165504-02 L1165504-03 L1165504-04 L1165504-05 L1165504-06 L1165504-07 L1165504-08 L1165504-09 L1165504-10	pН	J	Holding time exceeded (see text)

J - Estimated Value

#### Table 2

#### Field Duplicate Results Kansas City Board of Public Utilities (BPU) - Kansas City, Kansas Nearman Creek Power Station Bottom Ash Pond – November 2019

	Sample Identification: Date Sampled: SDG(s):	MW-2A 11/26/2019 L1165496 (radium)/ L1165504 (all others)	DUP-1 11/26/2019 L1165496 (radium)/ L1165504 (all others)	Meets QC Criteria
Parameter	Unit			
Dissolved Solids	mg/l	471	436	Yes
Chloride	mg/l	14	13.9	Yes
Fluoride	mg/l	0.274	0.271	Yes
Sulfate	mg/l	108	109	Yes
рН	su	7.23 J	7.23 J	Yes
Arsenic	mg/l	0.00248	0.00246	Yes
Barium	mg/l	0.116	0.115	Yes
Boron	mg/l	0.200 U	0.200 U	Yes
Calcium	mg/l	122	123	Yes
Lithium	mg/l	0.0205	0.0223	Yes
Molybdenum	mg/l	0.005 U	0.0500 U	Yes
Selenium	mg/l	0.0100 U	0.0100 U	
Combined Radium (including +/- uncertainty)	pCi/l	0.696 (+/- 0.654)	0.519 (+/- 0.620)	Yes

- J Estimated Value
- mg/l Milligrams per Liter
- pCi/l picoCuries per Liter
- QC Quality Control
- SDG Sample Delivery Group
  - su Standard Unit
  - U Nondetect



# ANALYTICAL REPORT

# Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description: L1165496 11/27/2019 62801 BPU Nearman groundwater

Report To:

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

Entire Report Reviewed By:

Linde Cashmen

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.

ACCOUNT: Kansas City Board of Public Utilities PROJECT: 62801 BPU Nearman SDG: L1165496 DATE/TIME: 12/27/19 15:11

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SDG: L1165496

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MW-2A/GW02 L1165496-01 Non-Potable Water			Collected by Jonathan Hermanson	Collected date/time 11/26/19 13:35	Received da 11/27/19 09:1	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-3/GW02 L1165496-02 Non-Potable Water			Jonathan Hermanson	11/26/19 14:35	11/27/19 09:1	0
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
adiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-4/GW02 L1165496-03 Non-Potable Water			Jonathan Hermanson	11/26/19 15:20	11/27/19 09:1	0
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
MW-8A/GW02 L1165496-04 Non-Potable Water			Collected by Jonathan Hermanson	Collected date/time 11/26/19 11:25	Received da 11/27/19 09:1	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-10/GW02 L1165496-05 Non-Potable Water			Jonathan Hermanson	11/26/19 12:40	11/27/19 09:1	0
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-13/GW02 L1165496-06 Non-Potable Water			Jonathan Hermanson	11/26/19 08:20	11/27/19 09:1	
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN

PROJECT: 62801 BPU Nearman

SDG: L1165496

# SAMPLE SUMMARY

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MW/14/CW/02 L11CE40C 07 New Detable Weter			Collected by Jonathan	Collected date/time 11/26/19 09:15	Received dat 11/27/19 09:10	
MW-14/GW02 L1165496-07 Non-Potable Water			Hermanson			
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/20/19 10:35	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-15/GW02 L1165496-08 Non-Potable Water			Jonathan Hermanson	11/26/19 10:10	11/27/19 09:10	)
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/23/19 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/23/19 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-16/GW02 L1165496-09 Non-Potable Water			Jonathan Hermanson	11/25/19 12:25	11/27/19 09:10	)
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/23/19 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/23/19 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method SM7500Ra B M	WG1394619	1	12/18/19 11:15	12/19/19 19:44	RGT	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
DUP-1/GW02 L1165496-10 Non-Potable Water			Jonathan Hermanson	11/26/19 00:00	11/27/19 09:10	)
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
	11/0/07 777 7		date/time	date/time		
Radiochemistry by Method 904	WG1397762	1	12/17/19 17:05	12/23/19 09:05	JMR	Mt. Juliet, TN
Radiochemistry by Method Calculation	WG1394619	1	12/18/19 11:15	12/23/19 09:05	JMR	Mt. Juliet, TN

WG1394619

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12/18/19 11:15

12/19/19 19:44

RGT

Mt. Juliet, TN

Radiochemistry by Method SM7500Ra B M

SDG: L1165496

#### CASE NARRATIVE

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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.

inde Cashman

Linda Cashman Project Manager



# MW-2A/GW02

# Collected date/time: 11/26/19 13:35

#### SAMPLE RESULTS - 01 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.670		0.410	0.63	12/20/2019 10:35	WG1397762	<u>_</u>
(T) Barium	102			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	102			79.0-136	12/20/2019 10:35	WG1397762	3

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.696		0.654	1.03	12/20/2019 10:35	WG1394619	ຶSr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.0255		0.244	0.404	12/19/2019 19:44	WG1394619
(T) Barium-133	80.3			30.0-143	12/19/2019 19:44	WG1394619

#### SAMPLE RESULTS - 02 L1165496

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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Ср
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.881		0.425	0.611	12/20/2019 10:35	WG1397762	Tc
(T) Barium	98.3			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	102			79.0-136	12/20/2019 10:35	WG1397762	³ SS

#### Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					4
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	1.01		0.604	0.872	12/20/2019 10:35	WG1394619	Šr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.129		0.179	0.261	12/19/2019 19:44	WG1394619
(T) Barium-133	101			30.0-143	12/19/2019 19:44	WG1394619

# MW-4/GW02

# Collected date/time: 11/26/19 15:20

#### SAMPLE RESULTS - 03 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.000		0.441	0.73	12/20/2019 10:35	WG1397762	2.
(T) Barium	96.1			62.0-143	12/20/2019 10:35	WG1397762	L
(T) Yttrium	117			79.0-136	12/20/2019 10:35	WG1397762	3

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.115		0.573	0.899	12/20/2019 10:35	WG1394619	Šr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.115		0.132	0.169	12/19/2019 19:44	<u>WG1394619</u>
(T) Barium-133	103			30.0-143	12/19/2019 19:44	WG1394619

# MW-8A/GW02

# Collected date/time: 11/26/19 11:25

# SAMPLE RESULTS - 04

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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.309		0.386	0.715	12/20/2019 10:35	WG1397762	ĺΤ.
(T) Barium	89.9			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	105			79.0-136	12/20/2019 10:35	WG1397762	³ C

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.491		0.564	0.932	12/20/2019 10:35	WG1394619	۲ Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-226	0.182		0.178	0.217	12/19/2019 19:44	WG1394619	
(T) Barium-133	97.2			30.0-143	12/19/2019 19:44	WG1394619	

# MW-10/GW02

# Collected date/time: 11/26/19 12:40

#### SAMPLE RESULTS - 05 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	 Ср
Analyte	pCi/l		+ / -	pCi/l	date / time		2
RADIUM-228	1.77		0.439	0.661	12/20/2019 10:35	WG1397762	Tc
(T) Barium	93.2			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	108			79.0-136	12/20/2019 10:35	WG1397762	³ Ss

#### Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					4
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	2.06		0.700	0.985	12/20/2019 10:35	WG1394619	[°] Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+ / -	pCi/l	date / time	
RADIUM-226	0.287		0.261	0.324	12/19/2019 19:44	WG1394619
(T) Barium-133	109			30.0-143	12/19/2019 19:44	WG1394619

# MW-13/GW02

# Collected date/time: 11/26/19 08:20

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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.143		0.429	0.733	12/20/2019 10:35	WG1397762	ŤΤ
(T) Barium	85.8			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	105			79.0-136	12/20/2019 10:35	WG1397762	3

#### Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					F	⁴ Cra
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch		Cn
Analyte	pCi/l		+ / -	pCi/l	date / time			5
Combined Radium	0.546		0.681	0.934	12/20/2019 10:35	WG1394619		Šr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	—
RADIUM-226	0.403		0.252	0.201	12/19/2019 19:44	WG1394619
(T) Barium-133	114			30.0-143	12/19/2019 19:44	WG1394619

#### MW-14/GW02 Collected date/time: 11/26/19 09:15

#### SAMPLE RESULTS - 07 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+ / -	pCi/l	date / time		2
RADIUM-228	0.0464		0.380	0.639	12/20/2019 10:35	WG1397762	Tc
(T) Barium	89.2			62.0-143	12/20/2019 10:35	WG1397762	
(T) Yttrium	115			79.0-136	12/20/2019 10:35	WG1397762	³ SS

#### Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					4
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.107		0.495	0.839	12/20/2019 10:35	WG1394619	[°] Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.0606		0.115	0.2	12/19/2019 19:44	WG1394619
(T) Barium-133	106			30.0-143	12/19/2019 19:44	WG1394619

# MW-15/GW02

# Collected date/time: 11/26/19 10:10

#### SAMPLE RESULTS - 08 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+/-	pCi/l	date / time		
RADIUM-228	0.270		0.415	0.77	12/23/2019 09:05	WG1397762	
(T) Barium	85.4			62.0-143	12/23/2019 09:05	WG1397762	
(T) Yttrium	108			79.0-136	12/23/2019 09:05	WG1397762	

#### Radiochemistry by Method Calculation

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5
Combined Radium	0.398		0.693	1.21	12/23/2019 09:05	WG1394619	Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	
Analyte	pCi/l		+ / -	pCi/l	date / time		
RADIUM-226	0.128		0.278	0.436	12/19/2019 19:44	WG1394619	
(T) Barium-133	106			30.0-143	12/19/2019 19:44	WG1394619	

# MW-16/GW02

# Collected date/time: 11/25/19 12:25

#### SAMPLE RESULTS - 09 L1165496

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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Cp
Analyte	pCi/l		+/-	pCi/l	date / time		2
RADIUM-228	0.392		0.392	0.594	12/23/2019 09:05	WG1397762	Tc
(T) Barium	97.5			62.0-143	12/23/2019 09:05	WG1397762	
(T) Yttrium	112			79.0-136	12/23/2019 09:05	WG1397762	³ Sc

#### Radiochemistry by Method Calculation

Radiochemistry by	Method Calcu	ulation					]	4
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch		Cn
Analyte	pCi/l		+/-	pCi/l	date / time			5
Combined Radium	0.995		0.760	0.926	12/23/2019 09:05	WG1394619		[°] Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.603		0.368	0.332	12/19/2019 19:44	WG1394619
(T) Barium-133	108			30.0-143	12/19/2019 19:44	WG1394619

#### DUP-1/GW02 Collected date/time: 11/26/19 00:00

#### SAMPLE RESULTS - 10 L1165496



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#### Radiochemistry by Method 904

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	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch	Ср
Analyte	pCi/l		+ / -	pCi/l	date / time		2
RADIUM-228	0.332		0.435	0.672	12/23/2019 09:05	WG1397762	Tc
(T) Barium	99.8			62.0-143	12/23/2019 09:05	WG1397762	
(T) Yttrium	114			79.0-136	12/23/2019 09:05	WG1397762	³ Ss

#### Radiochemistry by Method Calculation

Radiochemistry by	/ Method Calcu	ulation					4	Ca
	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch		Cn
Analyte	pCi/l		+/-	pCi/l	date / time		5	
Combined Radium	0.519		0.620	0.886	12/23/2019 09:05	WG1394619		Sr

	Result	Qualifier	Uncertainty	MDA	Analysis Date	Batch
Analyte	pCi/l		+/-	pCi/l	date / time	
RADIUM-226	0.187		0.185	0.214	12/19/2019 19:44	<u>WG1394619</u>
(T) Barium-133	105			30.0-143	12/19/2019 19:44	WG1394619

Radiochemistry by Method 904

#### QUALITY CONTROL SUMMARY L1165496-01,02,03,04,05,06,07,08,09,10

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#### Method Blank (MB)

Method Blank	(IVIB)		
(MB) R3485607-1 1	2/20/19 10:35		
	MB Result	MB Qualifier	MB MDA
Analyte	pCi/l		pCi/l
Radium-228	-0.305		0.431
(T) Barium	118		
(T) Yttrium	109		

#### L1165496-04 Original Sample (OS) • Duplicate (DUP)

(OS) L1165496-04 12/20	0/19 10:35 • (DUP)	R3485607-5	12/20/19 1	0:35				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-228	0.309	0.116	1	90.9	0.261		20	3
(T) Barium	89.9	97.8						
(T) Yttrium	105	110						

#### Laboratory Control Sample (LCS)

(LCS) R3485607-2 12/20/19 10:35										
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier					
Analyte	pCi/l	pCi/l	%	%						
Radium-228	5.00	5.22	104	80.0-120						
(T) Barium			111							
(T) Yttrium			103							

#### L1165496-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165496-04 12/20/19 10:35 • (MS) R3485607-3 12/20/19 10:35 • (MSD) R3485607-4 12/20/19 10:35													
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-228	10.0	0.309	12.9	13.2	126	129	1	70.0-130			1.99		20
(T) Barium		89.9			90.6	94.1							
(T) Yttrium		105			112	120							

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	62801 BPU Nearman	L1165496	12/27/19 15:11	16 of 22

Radiochemistry by Method SM7500Ra B M

## QUALITY CONTROL SUMMARY L1165496-01,02,03,04,05,06,07,08,09,10

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Method Blank (MB)

Method Didlik				
(MB) R3485240-1 12	/19/19 19:44			
	MB Result	MB Qualifier	MB MDA	
Analyte	pCi/l		pCi/l	
Radium-226	-0.00470		0.0454	
(T) Barium-133	105			

## L1165496-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1165496-09 12/	19/19 19:44 • (DUP) F	R3485240-5	12/19/19 19	:44				
	Original Result	DUP Result	Dilution	DUP RPD	DUP RER	DUP Qualifier	DUP RPD Limits	DUP RER Limit
Analyte	pCi/l	pCi/l		%			%	
Radium-226	0.603	0.143	1	123	1.15		20	3
(T) Barium-133	108	104						

## Laboratory Control Sample (LCS)

(LCS) R3485240-2 12/19/	19 19:44				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	pCi/l	pCi/l	%	%	
Radium-226	5.02	5.60	112	80.0-120	
(T) Barium-133			110		

## L1165496-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165496-04 12/19/19	9 19:44 • (MS) R3	3485240-3 12/	'19/19 19:44 • ( <b>i</b>	MSD) R348524	0-4 12/19/19 19	):44							
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	MS RER	RPD Limits
Analyte	pCi/l	pCi/l	pCi/l	pCi/l	%	%		%			%		%
Radium-226	20.1	0.182	18.7	17.2	92.2	84.5	1	75.0-125			8.58		20
(T) Barium-133		97.2			105	111							

# GLOSSARY OF TERMS

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## 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.

# **ACCREDITATIONS & LOCATIONS**

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
Alaska	17-026	Nevada
Arizona	AZ0612	New Han
Arkansas	88-0469	New Jers
California	2932	New Mex
Colorado	TN00003	New Yor
Connecticut	PH-0197	North Ca
Florida	E87487	North Ca
Georgia	NELAP	North Ca
Georgia ¹	923	North Da
Idaho	TN00003	Ohio–VA
Illinois	200008	Oklahom
Indiana	C-TN-01	Oregon
lowa	364	Pennsylv
Kansas	E-10277	Rhode Is
Kentucky 16	90010	South Ca
Kentucky ²	16	South Da
Louisiana	Al30792	Tennesse
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washingt
Mississippi	TN00003	West Virg
Missouri	340	Wisconsi
Montana	CERT0086	Wyoming

Vebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey-NELAP	TN002
New Mexico ¹	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee ^{1 4}	2006
Texas	T104704245-18-15
Texas⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
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**

Kansas City Board of Public Utilities

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.

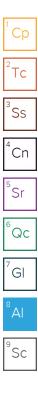


62801 BPU Nearman

L1165496

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			Billing Infor	mation:	-	TI			Analys	is / Contai	ner / Pres	ervative		Ch	ain of Custody	Page of
Kansas City Board of	Public Util	ities	Attn: Elle 300 N 65	en Bouse		Pres Chk		-						/	Pace A	
300 N 65th Street Kansas City, KS 66102			Kansas C	ity, KS 66102			EONH									
Report to: Ingrid Setzler		-	Email To: isetzler@b	pu.com;kbrown@			Add HN							M Ph Ph	2065 Lebanon Rd Jount Juliet, TN 3712 Jone: 615-758-5858 Jone: 800-767-5859	12223
Project Description: groundwater		City/State Collected:			Please Circ PT MT CT	1992	PE-A			and the second				-	DG # 116 5	USD55784
Phone: 913-573-9806	Client Project # 62801 BPU			Lab Project # KCKAN02-M	W NEARMAN		11-HDPE-	and and						13	G134	and the second se
Collected by (print): Jo anon Hummson	Site/Facility ID	#		P.O. #			\$A228								cctnum: KCK/ emplate:T150	the second s
Collected by (signature):	Rush? (La		Day	Quote #		_	Rad, RA226, RA228	1						P	relogin: P741	308 Kennedy
Immediately NA Y	Next Day Two Day Three Da	10 D	y (Rad Only) ay (Rad Only)	Date Res	ults Needed	No. of										dEX Ground
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	ot								Remarks	Sample # (lab only)
MW-2A/ GNOZ	Cost	NPW	-	11-26-19	1335	3	X	1								-01
MW-3/6402	(xab	NPW	-	11-26-14	12/35	3	X			100						Torong and the first
MW-4 6002	beab	NPW	-	11-26-14	1520	3	X		1	190		Service of the				03
MW-8A/ LW02	6000	NPW	-	11-26-19	1125	23	-								<u></u>	04
MW-10/6402	Grab	NPW	-	11-26-19	1240	X	X		-							05
MW-13 6002	lecas	NPW		11-26-19	0820	3	-									06
MW-14 / 6402	Liab	NPW	-	11-20-19	oais	E							-		li gangali an Nglatan	07
MW-15 /6402	Geob	NPW	-	11-26-14	1010	K	2 X		-						6	08
MW-16 / GHOC	beab	NPW	-	11-2519	1225	3	10000									07
DUP-1 16002	bean	NPW	-	11-26-10	-	1	XX		1992			Contract of		Gamel	e Receipt C	necklist
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Remarks:									pH	Ten		COC S Bottl Corre	Seal Pre Signed/I les arr: act bot	esent/Intact Accurate: ive intact: tles used: volume sent	
DW - Drinking Water OT - Other	Samples retu UPSF	rned via: edExC	ourier		Tracking #		1	A	< 1T-	ip Blank R	ceived.	Yes (No)	VOA Z Prese	Zero He arvatio	If Applica adspace: n Correct/C	ble hecked: _Y_N
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Relinquished by : (Signature)		Date:		Time:	Received for lab	by sig	nature)	m	0	ate: 1/07	119	me: 9:10	Hold:	3		NCF / OK

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Kansas City Board of F	Public Ut	ilities		en Bouse Sth Street		Pres Chk						Prace Ar	nalytical*
300 N 65th Street Kansas City, KS 66102			No. of the second s	City, KS 66102			33					And	na insury a nervenione
Report to: Ingrid Setzler	(E. A.A		Email To: isetzler@b	ppu.com;kbrown@			EONH PP					12065 Lebanon Rd Mount Juliet, TN 3712 Phone: 615-758-5858 Phone: 800-767-5859	
Project Description: groundwater		City/State Collected:			Please Circ PT MT CT		E-Ad					Fax: 615-758-5859	
Phone: <b>913-573-9806</b> Fax:	Client Project 62801 BPU			Lab Project # KCKAN02-M	W NEARMAN		1L-HDPE-Add					SDG # 1165	5496
Collected by (print):	Site/Facility IC	)#		P.O. #	1	1	A228 1					Acctnum: KCKA	
Collected by (signature):		ab MUST Be		Quote #			226,R/					Template: <b>T150</b> Prelogin: <b>P741</b>	308
Immediately NA Packed on Ice N $\not \in$ Y	Next Da Two Day Three D		(Rad Only) y (Rad Only)	Date Res	ults Needed	No. of	Rad, RA226, RA228					PM: 616 - Stacy I PB: 1 - 1 8 - Shipped Via: Fee	-1a M
Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	Cntrs	Tota F					Remarks	Sample # (lab only)
DUP-2		NPW		and side	1	3	×						-JH
MN-8AKWOZMS	Geals	GW	-	11-26-19	1125	4	x						04
MN-89/6WOZMS.O		GN	-	11-26-14	1125	4	X						04
				1-	4 11	1	14-14-1 1-1-1-1 1-1-1-1-1-1-1-1-1-1-1-1-				1		
State - State State	and the second			- for	In Am	Im							
7.2	1.00				an a		~	11-26-1	9				
		W. and	-			1	1234		<u> </u>				
* Matrix: SS - Soil AIR - Air F - Filter GW - Groundwater B - Bioassay WW - WasteWater	Remarks:			1		1			pH	Temp Other	COC Seal COC Signe Bottles a	mple Receipt Ch Present/Intact d/Accurate: rrive intact: ottles used:	NP Y I
DW - Drinking Water OT - Other	Samples retur	rned via: edExCou	rier	Т	racking #		10	~			Sufficien VOA Zero	t volume sent: <u>If Applicab</u> Headspace:	
Reinquished by : (Signature)		Date:	1000	Time: R	eceived by: (Sign	nature	A	all	Trip Blank R	eceived: Yes No HCL / MeoH TBR	RAD Scree	ion Correct/Ch n <0.5 mR/hr:	21
Religquished by : (Signature)	10.5	Date: 11-20			eceived by: (Sign	ature)			Temp:	Bottles Received:	If preservat	ion required by Lo	gin: Date/Time
Relinquished by : (Signature)		Date:			teceived for lab b	y: (Signa	ature)	~	Date:	Time: 119 9:10	Hold:		NCK / OK

Pace Analytical ® National Center for Testing & Innovation

and the second	Login #: L1165496 CI	Client:KCKAN02	Date:11/27	Evaluated by:Kelsey S
Z	Non-Conformance (check applicable items)	applicable items)		
Contraction of	Sample Integrity	Chain of Custody Clarification	on	
	Parameter(s) past holding time	Login Clarification Needed		If Broken Container:
	Temperature not in range	Chain of custody is incomplete	a	Insufficient packing material around container
	Improper container type	Please specify Metals requested.	ed.	Insufficient packing material inside cooler
	pH not in range.	Please specify TCLP requested.	d.	Improper handling by carrier (FedEx / UPS / Courie
	Insufficient sample volume.	Received additional samples not listed on coc.	not listed on coc.	Sample was frozen
	Sample is biphasic.	Sample ids on containers do not match ids on coc	not match ids on	Container lid not intact
	Vials received with headspace.	e. Trip Blank not received.		If no Chain of Custody:
	Broken container	Client did not "X" analysis.		Received by:
	Broken container:	Chain of Custody is missing		Date/Time:
	Sufficient sample remains			Temp./Cont. Rec./pH:
				Carrier:

# Login Comments: Received MW-16 with a pH of 6. pH adj 1600 11/27.

Tracking#

	III ndic:	Time:
TSR Initials: SK Client Contact:		

FUELIN TILSUL UCUIOIIS:

Noted. Please proceed with analysis. SK 12/2/19

-



# ANALYTICAL REPORT

December 09, 2019

# Kansas City Board of Public Utilities

Sample Delivery Group: Samples Received: Project Number: Description:

L1165504 11/27/2019 **KCBPU** Nearman GW-Creek Bottom Ash Pond

Report To:

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

Entire Report Reviewed By:

Tacy Kenned

Stacy Kennedy 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.

ACCOUNT: Kansas City Board of Public Utilities

PROJECT: KCBPU Nearman

SDG: L1165504

DATE/TIME: 12/09/19 18:03

PAGE: 1 of 35

Тс Ss Cn Sr ʹQc Gl A Sc

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2_	

² Tc
³ Ss
⁴ Cn
⁵ Sr
⁶ Qc
⁷ Gl
⁸ AI
⁹ Sc

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SDG: L1165504 DATE/TIME: 12/09/19 18:03

PAGE: 2 of 35

# SAMPLE SUMMARY

MW-2A L1165504-01 GW

Collected by

Jonathan

Hermanson

ONE LAB. NATIONWIDE.

Collected date/time Received date/time

11/26/19 13:35

11/27/19 09:10

*
¹ Cp

	² Tc
N	
N	3
N	ິSs
N	
N	⁴Cn
N	CIT
	5
	⁵Sr
	6
	ိုင္ရင
	7
	Í GI
N	
N N N	⁸ Al
N	8
N N	⁸ Al
N N	8
N N	⁸ Al

			Tiermanson			
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 00:29	12/05/19 00:29	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 09:24	12/05/19 09:24	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:31	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:29	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-3 L1165504-02 GW			Jonathan Hermanson	11/26/19 14:35	11/27/19 09:10	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 00:43	12/05/19 00:43	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:34	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:33	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-4 L1165504-03 GW			Jonathan Hermanson	11/26/19 15:20	11/27/19 09:10	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 00:57	12/05/19 00:57	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:36	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:36	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-8A L1165504-04 GW			Jonathan Hermanson	11/26/19 11:25	11/27/19 09:10	C
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 01:11	12/05/19 01:11	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 01:53	12/05/19 01:53	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:02	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 21:36	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received dat	te/time
MW-10 L1165504-05 GW			Jonathan Hermanson	11/26/19 12:40	11/27/19 09:10	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time	-	

				,	,	
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 02:06	12/05/19 02:06	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 03:36	12/05/19 03:36	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:39	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:39	LD	Mt. Juliet, TN

	SAMPLE S	SUMN	IARY		ONE L	.AB. NATIONWIDE
MW-13 L1165504-06 GW			Collected by Jonathan	Collected date/time 11/26/19 08:20	Received da 11/27/19 09:1	
	Datah	Dilution	Hermanson	Analysia	Analuat	Leastian
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1389339 WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1380722	1	12/05/19 04:04	12/05/19 04:04	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A Wet Chemistry by Method 9056A	WG1390722 WG1390722	5	12/05/19 04:04	12/05/19 04:18	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:41	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:43	LD	Mt. Juliet, TN
	W01388087	I	11/23/13 13:30	12/01/13 22.43	LD	Mit. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-14 L1165504-07 GW			Jonathan Hermanson	11/26/19 09:15	11/27/19 09:1	C
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 04:32	12/05/19 04:32	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 04:46	12/05/19 04:46	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:44	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:46	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
			Jonathan	11/26/19 10:10	11/27/19 09:1	
MW-15 L1165504-08 GW			Hermanson	11/20/13 10:10	11/27/13 03.1	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388445	1	11/27/19 23:00	11/27/19 23:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 05:00	12/05/19 05:00	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 05:14	12/05/19 05:14	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:47	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:49	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
MW-16 L1165504-09 GW			Jonathan Hermanson	11/25/19 12:25	11/27/19 09:1	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388931	1	11/30/19 17:00	11/30/19 17:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 05:27	12/05/19 05:27	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 06:09	12/05/19 06:09	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:49	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:52	LD	Mt. Juliet, TN
			Collected by	Collected date/time	Received da	te/time
			Jonathan	11/26/19 00:00	11/27/19 09:1	C

DUP-1 L1165504-10 GW			Jonathan Hermanson	11/26/19 00:00	11/27/19 09:10	0
Method	Batch	Dilution	Preparation	Analysis	Analyst	Location
			date/time	date/time		
Gravimetric Analysis by Method 2540 C-2011	WG1389359	1	12/02/19 13:13	12/02/19 13:58	MMF	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1388931	1	11/30/19 17:00	11/30/19 17:00	MSP	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	1	12/05/19 06:23	12/05/19 06:23	ELN	Mt. Juliet, TN
Wet Chemistry by Method 9056A	WG1390722	5	12/05/19 09:38	12/05/19 09:38	ELN	Mt. Juliet, TN
Metals (ICP) by Method 6010B	WG1388682	1	11/29/19 11:23	11/30/19 19:57	EL	Mt. Juliet, TN
Metals (ICPMS) by Method 6020	WG1388687	1	11/29/19 15:30	12/01/19 22:56	LD	Mt. Juliet, TN

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	KCBPU Nearman	L1165504	12/09/19 18:03	4 of 35

# CASE NARRATIVE

*

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.

enned

Stacy Kennedy Project Manager

Τс Ss Cn Sr Qc GI AI Sc

PROJECT: KCBPU Nearman SDG: L1165504 DATE/TIME: 12/09/19 18:03

PAGE:

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## SAMPLE RESULTS - 01 L1165504



Qc

Sc

## Gravimetric Analysis by Method 2540 C-2011

	· · · <b>)</b>						l'Cn	
	Result	Qualifier	RDL	Dilution	Analysis	Batch	Cp	
Analyte	mg/l		mg/l		date / time		2	i
Dissolved Solids	471		10.0	1	12/02/2019 13:58	WG1389359	Tc	

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 13:35

Wet Chemistry by Metho	od 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		4 Cn
pH	7.23	<u>T8</u>	1	11/27/2019 23:00	WG1388445	CII

## Sample Narrative:

L1165504-01 WG1388445: 7.23 at 16.5C

## Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ CI
Analyte	mg/l		mg/l		date / time		G
Chloride	14.0		1.00	1	12/05/2019 00:29	WG1390722	8
Fluoride	0.274		0.100	1	12/05/2019 00:29	WG1390722	Ă
Sulfate	108		25.0	5	12/05/2019 09:24	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.116		0.00500	1	11/30/2019 19:31	WG1388682
Boron	ND		0.200	1	11/30/2019 19:31	WG1388682
Calcium	122		1.00	1	11/30/2019 19:31	WG1388682
Lithium	0.0205		0.0150	1	11/30/2019 19:31	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:31	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:31	WG1388682

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.00248		0.00200	1	12/01/2019 22:29	WG1388687

## SAMPLE RESULTS - 02 L1165504

Qc

Sc

## Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch	Ср
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	638		10.0	1	12/02/2019 13:58	WG1389359	² Tc

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 14:35

Wet Chemistry by Metho	od 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	SU			date / time		⁴ Cn
рН	6.84	<u>T8</u>	1	11/27/2019 23:00	WG1388445	СП

## Sample Narrative:

L1165504-02 WG1388445: 6.84 at 17.2C

## Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	7 CI
Analyte	mg/l	mg/l		date / time		G
Chloride	7.35	1.00	1	12/05/2019 00:43	WG1390722	8
Fluoride	0.180	0.100	1	12/05/2019 00:43	WG1390722	ĬAĬ
Sulfate	93.4	5.00	1	12/05/2019 00:43	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.183		0.00500	1	11/30/2019 19:34	WG1388682
Boron	ND		0.200	1	11/30/2019 19:34	WG1388682
Calcium	181		1.00	1	11/30/2019 19:34	WG1388682
Lithium	0.0462		0.0150	1	11/30/2019 19:34	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:34	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:34	WG1388682

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	12/01/2019 22:33	WG1388687

## SAMPLE RESULTS - 03 L1165504



Ср

Qc

Sc

## Gravimetric Analysis by Method 2540 C-2011

							 1'
	Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte	mg/l		mg/l		date / time		2
Dissolved Solids	481		10.0	1	12/02/2019 13:58	WG1389359	-

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 15:20

Analyte	iiig/i		iliy/i		uale / line		2	
Dissolved Solids	481		10.0	1	12/02/2019 13:58	WG1389359	Γ	С
Wet Chemistry by	Method 9040C	, ,					3	Ss
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	SU			date / time			4	'n
рН	7.10	Т8	1	11/27/2019 23:00	WG1388445			

## Sample Narrative:

L1165504-03 WG1388445: 7.1 at 16.9C

## Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	⁷ CI
Analyte	mg/l	mg/l		date / time		G
Chloride	6.94	1.00	1	12/05/2019 00:57	WG1390722	8
Fluoride	0.235	0.100	1	12/05/2019 00:57	WG1390722	ĬAĬ
Sulfate	59.7	5.00	1	12/05/2019 00:57	WG1390722	

## Metals (ICP) by Method 6010B

Result	Qualifier	RDL	Dilution	Analysis	Batch
mg/l		mg/l		date / time	
0.134		0.00500	1	11/30/2019 19:36	<u>WG1388682</u>
ND		0.200	1	11/30/2019 19:36	WG1388682
128		1.00	1	11/30/2019 19:36	WG1388682
0.0265		0.0150	1	11/30/2019 19:36	WG1388682
ND		0.00500	1	11/30/2019 19:36	WG1388682
ND		0.0100	1	11/30/2019 19:36	WG1388682
	mg/l 0.134 ND 128 0.0265 ND	mg/l 0.134 ND 128 0.0265 ND	mg/l         mg/l           0.134         0.00500           ND         0.200           128         1.00           0.0265         0.0150           ND         0.00500	mg/l         mg/l           0.134         0.00500         1           ND         0.200         1           128         1.00         1           0.0265         0.0150         1           ND         0.00500         1	mg/l         mg/l         date / time           0.134         0.00500         1         11/30/2019 19:36           ND         0.200         1         11/30/2019 19:36           128         1.00         1         11/30/2019 19:36           0.0265         0.0150         1         11/30/2019 19:36           ND         0.00500         1         11/30/2019 19:36

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	12/01/2019 22:36	WG1388687

## SAMPLE RESULTS - 04 L1165504

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# Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Dissolved Solids	787		13.3	1	12/02/2019 13:58	WG1389359

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 11:25

Wet Chemistry by Method 9040C							
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	su			date / time			4 Cn
рН	7.11	<u>T8</u>	1	11/27/2019 23:00	WG1388445		CII

## Sample Narrative:

L1165504-04 WG1388445: 7.11 at 16.8C

## Wet Chemistry by Method 9056A

							_
	Result	Qualifier R	DL Dilut	ion Analysis	Batch	7	1
Analyte	mg/l	m	g/l	date / time			
Chloride	27.0	1.	00 1	12/05/2019 01:11	WG1390722	8	٦
Fluoride	0.329	0	100 1	12/05/2019 01:11	WG1390722	Ă	
Sulfate	324	2	5.0 5	12/05/2019 01:53	WG1390722		4

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.176	01	0.00500	1	11/30/2019 19:02	WG1388682
Boron	2.09	01	0.200	1	11/30/2019 19:02	WG1388682
Calcium	115	01	1.00	1	11/30/2019 19:02	WG1388682
Lithium	0.0188		0.0150	1	11/30/2019 19:02	WG1388682
Molybdenum	0.00953		0.00500	1	11/30/2019 19:02	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:02	WG1388682

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0266		0.00200	1	12/01/2019 21:36	WG1388687

## SAMPLE RESULTS - 05 L1165504

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## Gravimetric Analysis by Method 2540 C-2011

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		Result	Qualifier	RDL	Dilution	Analysis	Batch	
Analyte		mg/l		mg/l		date / time		2
Dissolved Solids		832		13.3	1	12/02/2019 13:58	WG1389359	

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 12:40

Wet Chemistry by Method 9040C						
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		4 Cn
рН	6.91	<u>T8</u>	1	11/27/2019 23:00	WG1388445	CII

## Sample Narrative:

L1165504-05 WG1388445: 6.91 at 16.1C

## Wet Chemistry by Method 9056A

	Result	Qualifier F	RDL	Dilution	Analysis	Batch	
Analyte	mg/l	r	mg/l		date / time		GI
Chloride	16.3	1	1.00	1	12/05/2019 02:06	WG1390722	8
Fluoride	0.146	C	0.100	1	12/05/2019 02:06	WG1390722	Ă
Sulfate	180	2	25.0	5	12/05/2019 03:36	WG1390722	

## Metals (ICP) by Method 6010B

Result	Qualifier	RDL	Dilution	Analysis	Batch
mg/l		mg/l		date / time	
0.138		0.00500	1	11/30/2019 19:39	WG1388682
1.36		0.200	1	11/30/2019 19:39	WG1388682
198		1.00	1	11/30/2019 19:39	WG1388682
0.0483		0.0150	1	11/30/2019 19:39	WG1388682
ND		0.00500	1	11/30/2019 19:39	WG1388682
ND		0.0100	1	11/30/2019 19:39	WG1388682
	mg/l 0.138 1.36 198 0.0483 ND	mg/l 0.138 1.36 198 0.0483 ND	mg/l         mg/l           0.138         0.00500           1.36         0.200           198         1.00           0.0483         0.0150           ND         0.00500	mg/l         mg/l           0.138         0.00500         1           1.36         0.200         1           198         1.00         1           0.0483         0.0150         1           ND         0.00500         1	mg/l         mg/l         date / time           0.138         0.00500         1         11/30/2019 19:39           1.36         0.200         1         11/30/2019 19:39           198         1.00         1         11/30/2019 19:39           0.0483         0.0150         1         11/30/2019 19:39           ND         0.00500         1         11/30/2019 19:39

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	12/01/2019 22:39	WG1388687

## SAMPLE RESULTS - 06 L1165504

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## Gravimetric Analysis by Method 2540 C-2011

	,	Result	Qualifier	RDL	Dilution	Analysis	Batch	 ľ
Analyte		mg/l		mg/l		date / time		Ē
Dissolved Solids		580		10.0	1	12/02/2019 13:58	WG1389359	ľ

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 08:20

Wet Chemistry by Method 9040C								
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	su			date / time			⁴ Cn	
рН	7.08	<u>T8</u>	1	11/27/2019 23:00	WG1388445		CII	

## Sample Narrative:

L1165504-06 WG1388445: 7.08 at 16.8C

## Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	7 Cl
Analyte	mg/l	mg/l		date / time		G
Chloride	21.3	1.00	1	12/05/2019 04:04	WG1390722	8
Fluoride	0.405	0.100	1	12/05/2019 04:04	WG1390722	٦A
Sulfate	165	25.0	5	12/05/2019 04:18	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.251		0.00500	1	11/30/2019 19:41	WG1388682
Boron	ND		0.200	1	11/30/2019 19:41	WG1388682
Calcium	115		1.00	1	11/30/2019 19:41	WG1388682
Lithium	0.0358		0.0150	1	11/30/2019 19:41	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:41	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:41	WG1388682

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0201		0.00200	1	12/01/2019 22:43	WG1388687

## SAMPLE RESULTS - 07 L1165504

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## Gravimetric Analysis by Method 2540 C-2011

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	Result	Qualifier RDL	Dilution	Analysis	Batch	L
Analyte	mg/l	mg/l		date / time		2
Dissolved Solids	533	10.0	1	12/02/2019 13:58	WG1389359	Ĩ

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 09:15

Wet Chemistry by Method 9040C								
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	su			date / time			⁴ Cn	
рН	7.11	<u>T8</u>	1	11/27/2019 23:00	WG1388445		CII	

## Sample Narrative:

L1165504-07 WG1388445: 7.11 at 16.9C

## Wet Chemistry by Method 9056A

	*					
	Result	Qualifier RDL	Dilution	Analysis	Batch	
Analyte	mg/l	mg/l		date / time		UI
Chloride	12.9	1.00	1	12/05/2019 04:32	WG1390722	8
Fluoride	0.265	0.100	1	12/05/2019 04:32	WG1390722	ĬAĬ
Sulfate	121	25.0	5	12/05/2019 04:46	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.0864		0.00500	1	11/30/2019 19:44	WG1388682
Boron	ND		0.200	1	11/30/2019 19:44	WG1388682
Calcium	130		1.00	1	11/30/2019 19:44	WG1388682
Lithium	0.0154		0.0150	1	11/30/2019 19:44	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:44	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:44	WG1388682

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	ND		0.00200	1	12/01/2019 22:46	WG1388687

## SAMPLE RESULTS - 08 L1165504

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# Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier RDL	Dilution	Analysis	Batch	
Analyte	mg/l	mg/l		date / time		2
Dissolved Solids	452	10.0	1	12/02/2019 13:58	<u>WG1389359</u>	

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 10:10

Wet Chemistry by Method 9040C ³ Ss								
	Result	Qualifier	Dilution	Analysis	Batch			
Analyte	su			date / time			⁴ Cn	
рН	7.45	T8	1	11/27/2019 23:00	WG1388445		CII	

## Sample Narrative:

L1165504-08 WG1388445: 7.45 at 16.9C

## Wet Chemistry by Method 9056A

	Result	Qualifier RDL	Dilution	Analysis	Batch	⁷ CI
Analyte	mg/l	mg/l		date / time		G
Chloride	13.9	1.00	1	12/05/2019 05:00	WG1390722	8
Fluoride	0.486	0.100	1	12/05/2019 05:00	WG1390722	ĬAĬ
Sulfate	162	25.0	5	12/05/2019 05:14	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.103		0.00500	1	11/30/2019 19:47	WG1388682
Boron	ND		0.200	1	11/30/2019 19:47	WG1388682
Calcium	71.4		1.00	1	11/30/2019 19:47	WG1388682
Lithium	0.0414		0.0150	1	11/30/2019 19:47	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:47	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:47	WG1388682

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0104		0.00200	1	12/01/2019 22:49	WG1388687

## SAMPLE RESULTS - 09 L1165504

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# Gravimetric Analysis by Method 2540 C-2011

	Result	Qualifier RDL	Dilution	Analysis	Batch	ľ
Analyte	mg/l	mg/l		date / time		E
Dissolved Solids	784	13.3	1	12/02/2019 13:58	WG1389359	

## Wet Chemistry by Method 9040C

Wet Chemistry by Method 9040C							
	Result	Qualifier	Dilution	Analysis	Batch		
Analyte	su			date / time			⁴ Cn
рН	6.76	<u>T8</u>	1	11/30/2019 17:00	WG1388931		CII

## Sample Narrative:

L1165504-09 WG1388931: 6.76 at 14.5C

Collected date/time: 11/25/19 12:25

## Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch	⁷ Cl
Analyte	mg/l		mg/l		date / time		GI
Chloride	4.01		1.00	1	12/05/2019 05:27	WG1390722	8
Fluoride	0.136		0.100	1	12/05/2019 05:27	WG1390722	Ă
Sulfate	123		25.0	5	12/05/2019 06:09	WG1390722	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.257		0.00500	1	11/30/2019 19:49	WG1388682
Boron	ND		0.200	1	11/30/2019 19:49	WG1388682
Calcium	224		1.00	1	11/30/2019 19:49	WG1388682
Lithium	0.0646		0.0150	1	11/30/2019 19:49	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:49	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:49	WG1388682

## Metals (ICPMS) by Method 6020

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.0342		0.00200	1	12/01/2019 22:52	WG1388687

## SAMPLE RESULTS - 10 L1165504

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# Gravimetric Analysis by Method 2540 C-2011

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	Result	Qualifier RDL	Dilution	Analysis	Batch	
Analyte	mg/l	mg/l		date / time		
Dissolved Solids	436	10.0	1	12/02/2019 13:58	<u>WG1389359</u>	

## Wet Chemistry by Method 9040C

Collected date/time: 11/26/19 00:00

Wet Chemistry by	Method 9040C					³ Ss
	Result	Qualifier	Dilution	Analysis	Batch	
Analyte	su			date / time		4 Cn
pН	7.23	<u>T8</u>	1	11/30/2019 17:00	WG1388931	CII

## Sample Narrative:

L1165504-10 WG1388931: 7.23 at 15.4C

## Wet Chemistry by Method 9056A

	Result	Qualifier	RDL	Dilution	Analysis	Batch		7 Cl
Analyte	mg/l		mg/l		date / time			GI
Chloride	13.9		1.00	1	12/05/2019 06:23	<u>WG1390722</u>		8
Fluoride	0.271		0.100	1	12/05/2019 06:23	<u>WG1390722</u>		Ă
Sulfate	109		25.0	5	12/05/2019 09:38	WG1390722	L	

## Metals (ICP) by Method 6010B

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Barium	0.115		0.00500	1	11/30/2019 19:57	WG1388682
Boron	ND		0.200	1	11/30/2019 19:57	WG1388682
Calcium	123		1.00	1	11/30/2019 19:57	WG1388682
Lithium	0.0223		0.0150	1	11/30/2019 19:57	WG1388682
Molybdenum	ND		0.00500	1	11/30/2019 19:57	WG1388682
Selenium	ND		0.0100	1	11/30/2019 19:57	WG1388682

	Result	Qualifier	RDL	Dilution	Analysis	Batch
Analyte	mg/l		mg/l		date / time	
Arsenic	0.00246		0.00200	1	12/01/2019 22:56	WG1388687

Gravimetric Analysis by Method 2540 C-2011

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08,09,10

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## Method Blank (MB)

(MB) R3478527-1 12/	02/19 13:58			
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Dissolved Solids	U		2.82	10.0

## L1165504-10 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-10 12/02/	'19 13:58 • (DUP)	R3478527-3	12/02/19 13	:58		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Dissolved Solids	436	448	1	2.71		5

## Laboratory Control Sample (LCS)

(LCS) R3478527-2 12	/02/19 13:58				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Dissolved Solids	8800	8490	96.5	85.0-115	

DATE/TIME: 12/09/19 18:03

PAGE: 16 of 35

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08

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# L1165323-01 Original Sample (OS) • Duplicate (DUP)

OS) L1165323-01 11/2	7/19 23:00 • (DUP)	) R3477159-2	11/27/19 23	3:00		
		ult DUP Result		n DUP RPD	DUP Qualifier	DUP RPD Limits
alyte	SU	SU		%		%
ЭΗ	7.37	7.35	1	0.272		1
ample Narrative: OS: 7.37 at 18.6C						

DUP: 7.35 at 18.5C

## L1165323-02 Original Sample (OS) • Duplicate (DUP)

#### (OS) L1165323-02 11/27/19 23:00 • (DUP) R3477159-3 11/27/19 23:00 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 7.30 7.34 1 0.546 1 Sample Narrative:

OS: 7.3 at 17.7C

DUP: 7.34 at 17.9C

## L1165323-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-05 11/27/19	9 23:00 • (DUP)	R3477159-4 1	1/27/19 23	:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.40	7.34	1	0.814		1

## Sample Narrative:

OS: 7.4 at 18.6C

DUP: 7.34 at 19.2C

## L1165323-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-08 11/27/19	6) L1165323-08 11/27/19 23:00 • (DUP) R3477159-5 11/27/19 23:00											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits						
Analyte	su	su		%		%						
рН	7.41	7.38	1	0.406		1						

## Sample Narrative:

ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Kansas City Board of Public Utilities	KCBPU Nearman	L1165504	12/09/19 18:03	17 of 35

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08

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# L1165323-08 Original Sample (OS) • Duplicate (DUP)

2100020 00 011	gina oann					 l'Cr
(OS) L1165323-08 11/27	7/19 23:00 • (D	UP) R3477159-5	11/27/19 23:00			
	Original Re	esult DUP Result	Dilution DUP RPD	DUP Qualifier	IP RPD nits	2 TC
Analyte	SU	SU	%			
OS: 7.41 at 18.7C						3
DUP: 7.38 at 18.4C						59

## L1165323-12 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-12 11/27	7/19 23:00 • (DUP)	R3477159-6 1	1/27/19 23	:00		
	Original Resul	t DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
рН	7.42	7.40	1	0.270		1
Sample Narrative:						

## Sample Narrative:

OS: 7.42 at 18.2C

DUP: 7.4 at 18C

## L1165323-15 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-15 11/27/19	23:00 • (DUP) F	23477159-7 11	/27/19 23:0	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.40	7.42	1	0.270		1

## Sample Narrative:

OS: 7.4 at 18.3C

DUP: 7.42 at 18.3C

## L1165323-21 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-21 11/27/19	23:00 • (DUP) I	R3477159-8 11	/27/19 23:0	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.28	7.31	1	0.411		1

## Sample Narrative:

OS: 7.28 at 18.5C DUP: 7.31 at 18.5C

ACCOUNT:	
Kansas City Board of Public Utilities	

DATE/TIME: 12/09/19 18:03

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08

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# L1165323-29 Original Sample (OS) • Duplicate (DUP)

L1105525-25 01	iginal Sample	(00) • Du	plicate (				1 Cn
(OS) L1165323-29 11/2	27/19 23:00 • (DUP)	R3477159-9	11/27/19 23	:00			–   Cp
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	2 Tc
Analyte	SU	su		%		%	
рН	7.31	7.36	1	0.682		1	³ Ss
Sample Narrative: OS: 7.31 at 17.2C							⁴Cn

OS: 7.31 at 17.2C

DUP: 7.36 at 17.5C

## L1165325-01 Original Sample (OS) • Duplicate (DUP)

### (OS) L1165325-01 11/27/19 23:00 • (DUP) R3477159-10 11/27/19 23:00 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 8.26 8.27 1 0.121 1 Sample Narrative: OS: 8.26 at 18.7C

DUP: 8.27 at 18.7C

## L1165419-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165419-01 11/27/19	23:00 • (DUP) R	3477159-11 11,	/27/19 23:0	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	8.71	8.71	1	0.000		1

## Sample Narrative:

OS: 8.71 at 18.5C DUP: 8.71 at 18.7C

## L1165497-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165497-01 11/27/19	(OS) L1165497-01 11/27/19 23:00 • (DUP) R3477159-12 11/27/19 23:00					
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	10.4	10.4	1	0.000		1

## Sample Narrative:

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# QUALITY CONTROL SUMMARY

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# L1165497-01 Original Sample (OS) • Duplicate (DUP)

		(00) Dup					
(OS) L1165497-01 11/27/	/19 23:00 • (DUP) I	R3477159-12 ´	11/27/19 23	:00			
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	OUP RPD imits	
Analyte	SU	su		%		,	
OS: 10.37 at 17.6C							
DUP: 10.37 at 17.7C							

## L1165502-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165502-01 11/2	7/19 23:00 • (DU	P) R3477159-13	11/27/19 23	3:00		
	Original Res	ult DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	SU		%		%
рН	8.93	8.92	1	0.112		1
Sample Narrative:						

## Sample Narrative:

OS: 8.93 at 16.7C

DUP: 8.92 at 16.8C

## L1165504-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-01 11/27/19 23:00 · (DUP) R3477159-14 11/27/19 23:00						
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	7.23	7.29	1	0.826		1

## Sample Narrative:

OS: 7.23 at 16.5C

DUP: 7.29 at 17.1C

## L1165504-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-02 11/27/19	9 23:00 • (DUP)	R3477159-15	11/27/19 23	:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	6.84	6.82	1	0.293		1

## Sample Narrative:

OS: 6.84 at 17.2C DUP: 6.82 at 17.2C

ACCOUNT:	
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DATE/TIME: 12/09/19 18:03

Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08

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# L1165504-03 Original Sample (OS) • Duplicate (DUP)

OS) L1165504-03 11/2						
(,		It DUP Result			DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.10	7.06	1	0.565		1
Sample Narrative: OS: 7.1 at 16.9C						

DUP: 7.06 at 16.7C

## L1165504-04 Original Sample (OS) • Duplicate (DUP)

#### (OS) L1165504-04 11/27/19 23:00 • (DUP) R3477159-17 11/27/19 23:00 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 7.11 7.13 1 0.281 1 Sample Narrative:

OS: 7.11 at 16.8C DUP: 7.13 at 17C

## L1165504-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-05 11/27/19	23:00 • (DUP)	R3477159-18	11/27/19 23	3:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	6.91	6.93	1	0.289		1

## Sample Narrative:

OS: 6.91 at 16.1C

DUP: 6.93 at 16.2C

## L1165504-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-06 11/27/19	9 23:00 • (DUP)	R3477159-19	11/27/19 23	3:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.08	7.08	1	0.000		1

## Sample Narrative:

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# L1165504-06 Original Sample (OS) • Duplicate (DUP)

2100000100001	• ·						 ľ
(OS) L1165504-06 11/27	7/19 23:00 • (DUP)	R3477159-19	11/27/19 23	3:00			
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	IP RPD nits	2
Analyte	SU	su		%			
OS: 7.08 at 16.8C							3
DUP: 7.08 at 16.6C							

## L1165504-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-07 11/2	7/19 23:00 • (DUF	) R3477159-20	11/27/19 2	23:00		
	Original Resu	t DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
H	7.11	7.11	1	0.000		1
ample Narrative:						

## Sample Narrative:

OS: 7.11 at 16.9C

DUP: 7.11 at 16.9C

## L1165504-08 Original Sample (OS) • Duplicate (DUP)

Original Result     DUP Result     Dilution     DUP RPD     DUP Qualifier     DUP RPD Limits       Analyte     su     %     %	(OS) L1165504-08 11/27/19	23:00 • (DUP)	R3477159-21	11/27/19 23	3:00		
Analyte su su % %		Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
•	Analyte	su	SU		%		%
pH 7.45 7.51 1 0.802 1	рН	7.45	7.51	1	0.802		1

## Sample Narrative:

OS: 7.45 at 16.9C

DUP: 7.51 at 17.1C

## Laboratory Control Sample (LCS)

(LCS) R3477159-1 11/27/19	23:00				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	SU	%	%	
рН	10.0	9.90	99.0	99.0-101	

## Sample Narrative:

LCS: 9.9 at 18.9C

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# QUALITY CONTROL SUMMARY

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# L1165323-04 Original Sample (OS) • Duplicate (DUP)

211000020 01 01	iginal sample	(00) - Du	Sheare (				L'C
(OS) L1165323-04 11/3	30/19 17:00 • (DUP) F	23477694-2	11/30/19 17:	:00			Ľ
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	²
Analyte	SU	su		%		%	
рН	7.31	7.40	1	1.22	<u>J3</u>	1	³ S
Sample Narrative:							
OS: 7.31 at 14.3C							⁴ C
DUP: 7.4 at 14C							

# L1165323-09 Original Sample (OS) • Duplicate (DUP)

## (OS) L1165323-09 11/30/19 17:00 • (DUP) R3477694-3 11/30/19 17:00 DUP RPD Original Result DUP Result DUP Qualifier Dilution DUP RPD Limits % % Analyte su su pН 7.39 7.42 1 0.405 1 Sample Narrative: OS: 7.39 at 13C

DUP: 7.42 at 13C

## L1165323-14 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-14 11/30/19	9 17:00 • (DUP) R	3477694-4 11	/30/19 17:0	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	SU		%		%
рН	7.42	7.39	1	0.405		1

## Sample Narrative:

OS: 7.42 at 13.1C

DUP: 7.39 at 13.7C

## L1165323-20 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-20 11/30/19	9 17:00 • (DUP)	R3477694-5 ´	11/30/19 17:	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
рН	7.63	7.54	1	1.19	<u>J3</u>	1

## Sample Narrative:

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# QUALITY CONTROL SUMMARY

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# L1165323-20 Original Sample (OS) • Duplicate (DUP)

			Sheate (					   'Cr
(OS) L1165323-20 11/3	0/19 17:00 • (DUP)	R3477694-5	11/30/19 17:	00				
	Original Result	t DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		² Tc
Analyte	SU	SU		%		%		
OS: 7.63 at 13.1C								3
DUP: 7.54 at 14C								SS

## L1165323-25 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-25 11/3	0/19 17:00 • (DUP) F	R3477694-6	11/30/19 17:	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	7.42	7.34	1	1.08	<u>J3</u>	1
Sample Narrative:						

## Sample Narrative:

OS: 7.42 at 13.4C

DUP: 7.34 at 13.3C

## L1165323-30 Original Sample (OS) • Duplicate (DUP)

Original Result DUP Result Dilution DUP RPD DUP Qualifier Limits	(OS) L1165323-30 11/30/19	9 17:00 • (DUP) R3477694-7	11/30/19 17:	00		
		Original Result DUP Result	Dilution	DUP RPD	DUP Qualifier D	DUP RPD Limits
Analyte su su % %	Analyte	su su		%	%	%
pH 7.41 7.40 1 0.135 1	рН	7.41 7.40	1	0.135	1	1

## Sample Narrative:

OS: 7.41 at 14.2C

DUP: 7.4 at 14.9C

## L1165323-31 Original Sample (OS) • Duplicate (DUP)

(OS) L1165323-31 11/30/19	17:00 • (DUP) F	3477694-8 11	1/30/19 17:0	0		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	7.34	7.38	1	0.543		1

## Sample Narrative:

OS: 7.34 at 14.4C DUP: 7.38 at 14.9C

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Wet Chemistry by Method 9040C

## QUALITY CONTROL SUMMARY L1165504-09,10

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# L1165504-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-09 11/30	0/19 17:00 • (DUP)	R3477694-9	11/30/19 17	:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	6.76	6.75	1	0.148		1
Sample Narrative:						
OS: 6.76 at 14.5C						
DLIP: 6 75 at 1/ 6C						

DUP: 6.75 at 14.6C

## L1165504-10 Original Sample (OS) • Duplicate (DUP)

### (OS) L1165504-10 11/30/19 17:00 • (DUP) R3477694-10 11/30/19 17:00 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 7.23 7.23 1 0.000 1 Sample Narrative: OS: 7.23 at 15.4C

DUP: 7.23 at 15.6C

## L1165586-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165586-01 11/30/19	9 17:00 • (DUP) F	23477694-11 1	1/30/19 17:0	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	SU		%		%
рH	8.35	8.40	1	0.597		1

## Sample Narrative:

OS: 8.35 at 17.4C DUP: 8.4 at 17.6C

## L1165616-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1165616-02 11/30/19	(OS) L1165616-02 11/30/19 17:00 • (DUP) R3477694-12 11/30/19 17:00											
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits						
Analyte	SU	su		%		%						
рН	6.22	6.25	1	0.481		1						

## Sample Narrative:

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# L1165616-02 Original Sample (OS) • Duplicate (DUP)

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(OS) L1165616-02 11/30	/19 17:00 • (DUP) I	R3477694-12	11/30/19 17	:00			Cp
	Original Result	t DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits	2 Tc
Analyte	SU	SU		%		%	
OS: 6.22 at 16.9C							3
DUP: 6.25 at 17.6C							Ss

## L1165618-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1165618-02 11/30/	/19 17:00 • (DUP) F	83477694-13	11/30/19 17:	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
рН	7.68	7.67	1	0.130		1
Sample Narrative						

## Sample Narrative:

OS: 7.68 at 14.9C

DUP: 7.67 at 16.2C

## L1165684-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165684-01 11/30/19	17:00 • (DUP) R	3477694-14 1	1/30/19 17:	00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	SU	su		%		%
рН	6.88	6.85	1	0.437		1

## Sample Narrative:

OS: 6.88 at 14.9C

DUP: 6.85 at 14.8C

# L1165684-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1165684-02 11/30/19	DS) L1165684-02 11/30/19 17:00 • (DUP) R3477694-15 11/30/19 17:00										
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits					
Analyte	su	SU		%		%					
рН	4.66	4.66	1	0.000		1					

## Sample Narrative:

OS: 4.66 at 14.4C DUP: 4.66 at 14.1C

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## QUALITY CONTROL SUMMARY L1165504-09,10

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# L1165684-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1165684-03 11/3	0/19 17:00 • (DUP)	R3477694-16	11/30/19 1	7:00		
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
рН	3.85	3.88	1	0.776		1
Sample Narrative:						
•						
OS: 3.85 at 14.9C						
DI ID: 3 88 at 150						

DUP: 3.88 at 15C

# L1165723-01 Original Sample (OS) • Duplicate (DUP)

### (OS) L1165723-01 11/30/19 17:00 • (DUP) R3477694-17 11/30/19 17:00 DUP RPD Original Result DUP Result Dilution DUP RPD **DUP** Qualifier Limits % % Analyte su su pН 8.02 8.07 1 0.622 1 Sample Narrative: OS: 8.02 at 16.2C

DUP: 8.07 at 16.2C

## L1165844-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1165844-01 11/30/19 17:00 • (DUP) R3477694-18 11/30/19 17:00									
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits			
Analyte	SU	SU		%		%			
рН	6.17	6.24	1	1.13	<u>J3</u>	1			

## Sample Narrative:

OS: 6.17 at 16.2C

## DUP: 6.24 at 16.6C

## Laboratory Control Sample (LCS)

(LCS) R3477694-1 11/3	0/19 17:00				
	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pН	10.0	9.98	99.8	99.0-101	
Sample Narrative:					
LCS: 9.98 at 19.2C					

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## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08,09,10

## Method Blank (MB)

(MB) R3479346-1	12/04/19 16:26

(1010) 1(347 5340-1	12/04/13 10.20				
	MB Result	MB Qualifier	MB MDL	MB RDL	
Analyte	mg/l		mg/l	mg/l	
Chloride	U		0.0519	1.00	
Fluoride	U		0.00990	0.100	
Sulfate	U		0.0774	5.00	

## L1165338-09 Original Sample (OS) • Duplicate (DUP)

· · ·	, ,					
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Chloride	7.16	7.13	1	0.466		15
Fluoride	0.156	0.153	1	1.69		15
Sulfate	17.4	17.3	1	0.213		15

## L1165504-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-05 12/05/19	9 02:06 • (DUP)	) R3479346-7	12/05/19	03:23			
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	P RPD its	
Analyte	mg/l	mg/l		%			
Chloride	16.3	16.2	1	0.386			
Fluoride	0.146	0.147	1	0.547			

## L1165504-05 Original Sample (OS) • Duplicate (DUP)

(OS) L1165504-05 12/05/19 03:36 • (DUP) R3479346-8 12/05/19 03:50								
	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits		
Analyte	mg/l	mg/l		%		%		
Sulfate	180	185	5	2.58		15		

## Laboratory Control Sample (LCS)

/04/19 16:40				
Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
mg/l	mg/l	%	%	
40.0	38.6	96.4	80.0-120	
8.00	7.80	97.5	80.0-120	
40.0	39.4	98.6	80.0-120	
	Spike Amount           mg/l           40.0           8.00	Spike Amount         LCS Result mg/l           40.0         38.6           8.00         7.80	Spike Amount         LCS Result mg/l         LCS Rec.           40.0         38.6         96.4           8.00         7.80         97.5	Spike Amount mg/l         LCS Result mg/l         LCS Rec. %         Rec. Limits %           40.0         38.6         96.4         80.0-120           8.00         7.80         97.5         80.0-120

ACCOUNT: Kansas City Board of Public Utilities

PROJECT: KCBPU Nearman

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## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08,09,10

# L1165338-09 Original Sample (OS) • Matrix Spike (MS)

(OS) L1165338-09 12/04/19 21:43 • (MS) R3479346-4 12/04/19 22:10									
	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier		
Analyte	mg/l	mg/l	mg/l	%		%			
Chloride	50.0	7.16	57.3	100	1	80.0-120			
Fluoride	5.00	0.156	5.12	99.2	1	80.0-120			
Sulfate	50.0	17.4	67.5	100	1	80.0-120			

## L1165504-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165504-04 12/05/1	9 01:11 • (MS) R3	3479346-5 12/0	05/19 01:25 • (N	MSD) R347934	6-6 12/05/19 0	1:39						
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Chloride	50.0	27.0	70.8	71.2	87.7	88.5	1	80.0-120			0.580	15
Fluoride	5.00	0.329	4.73	4.77	88.0	88.9	1	80.0-120			0.955	15
Sulfate	50.0	315	338	338	46.0	46.4	1	80.0-120	EV	EV	0.0672	15

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Metals (ICP) by Method 6010B

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08,09,10

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## Method Blank (MB)

(MB) R3477828-1	11/30/19 18:54

( )				
	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Barium	U		0.00170	0.00500
Boron	U		0.0126	0.200
Calcium	0.137	J	0.0463	1.00
Lithium	U		0.00530	0.0150
Molybdenum	U		0.00160	0.00500
Selenium	U		0.00740	0.0100

# Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3477828-2 11/30	'19 18:57 • (LCSD	) R3477828-3	11/30/19 18:59								
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits	7
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%	΄G
Barium	1.00	0.988	1.01	98.8	101	80.0-120			1.87	20	
Boron	1.00	0.982	0.981	98.2	98.1	80.0-120			0.102	20	8
Calcium	10.0	9.96	10.1	99.6	101	80.0-120			1.13	20	
Lithium	1.00	1.03	1.03	103	103	80.0-120			0.387	20	9
Molybdenum	1.00	0.996	1.01	99.6	101	80.0-120			1.19	20	ľ So
Selenium	1.00	0.945	0.958	94.5	95.8	80.0-120			1.41	20	

# L1165504-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165504-04 11/30/19 19:02 • (MS) R3477828-5 11/30/19 19:07 • (MSD) R3477828-6 11/30/19 19:09												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Barium	1.00	0.176	1.16	1.17	97.9	99.6	1	75.0-125			1.45	20
Boron	1.00	2.09	3.05	3.06	95.5	97.0	1	75.0-125			0.489	20
Calcium	10.0	115	124	124	87.9	86.5	1	75.0-125			0.112	20
Lithium	1.00	0.0188	1.02	1.03	100	101	1	75.0-125			1.08	20
Molybdenum	1.00	0.00953	1.01	1.03	100	102	1	75.0-125			1.71	20
Selenium	1.00	ND	0.980	0.991	98.0	99.1	1	75.0-125			1.13	20

PROJECT: KCBPU Nearman SDG: L1165504 DATE/TIME: 12/09/19 18:03

PAGE: 30 of 35

Metals (ICPMS) by Method 6020

## QUALITY CONTROL SUMMARY L1165504-01,02,03,04,05,06,07,08,09,10

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## Method Blank (MB)

(MB) R3477867-1 12/01/19 21:26								
	MB Result	MB Qualifier	MB MDL	MB RDL				
Analyte	mg/l		mg/l	mg/l				
Arsenic	U		0.000250	0.00200				

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3477867-2 12/01/19	21:29 • (LCSD)	) R3477867-3 ´	12/01/19 21:33							
	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Arsenic	0.0500	0.0489	0.0496	97.8	99.3	80.0-120			1.52	20

## L1165504-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1165504-04 12/01/19 21:36 • (MS) R3477867-5 12/01/19 21:43 • (MSD) R3477867-6 12/01/19 21:46												
	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyta	ma/l	mall	ma/l	ma/l	0/	0/		0/			0/	0/
Analyte	mg/l	mg/l	mg/l	mg/i	/0	/0		/0			/0	/0

SDG: L1165504 DATE/TIME: 12/09/19 18:03

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# GLOSSARY OF TERMS

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## 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.
J3	The associated batch QC was outside the established quality control range for precision.
01	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
T8	Sample(s) received past/too close to holding time expiration.
V	The sample concentration is too high to evaluate accurate spike recoveries.

# **ACCREDITATIONS & LOCATIONS**

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
Alaska	17-026	Nevada
Arizona	AZ0612	New Hampshire
Arkansas	88-0469	New Jersey–NEL
California	2932	New Mexico ¹
Colorado	TN00003	New York
Connecticut	PH-0197	North Carolina
Florida	E87487	North Carolina ¹
Georgia	NELAP	North Carolina ³
Georgia ¹	923	North Dakota
Idaho	TN00003	Ohio–VAP
Illinois	200008	Oklahoma
Indiana	C-TN-01	Oregon
lowa	364	Pennsylvania
Kansas	E-10277	Rhode Island
Kentucky 16	90010	South Carolina
Kentucky ²	16	South Dakota
Louisiana	AI30792	Tennessee ^{1 4}
Louisiana ¹	LA180010	Texas
Maine	TN0002	Texas ⁵
Maryland	324	Utah
Massachusetts	M-TN003	Vermont
Michigan	9958	Virginia
Minnesota	047-999-395	Washington
Mississippi	TN00003	West Virginia
Missouri	340	Wisconsin
Montana	CERT0086	Wyoming

Nebraska	NE-OS-15-05
Nevada	TN-03-2002-34
New Hampshire	2975
New Jersey-NELAP	TN002
New Mexico 1	n/a
New York	11742
North Carolina	Env375
North Carolina ¹	DW21704
North Carolina ³	41
North Dakota	R-140
Ohio-VAP	CL0069
Oklahoma	9915
Oregon	TN200002
Pennsylvania	68-02979
Rhode Island	LAO00356
South Carolina	84004
South Dakota	n/a
Tennessee 1 4	2006
Texas	T104704245-18-15
Texas ⁵	LAB0152
Utah	TN00003
Vermont	VT2006
Virginia	460132
Washington	C847
West Virginia	233
Wisconsin	9980939910
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**

Kansas City Board of Public Utilities

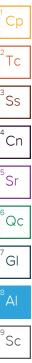
Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



KCBPU Nearman

L1165504





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MW-3/GNOZ	Grab	GW	-	11-26-19	1520	3	X	X	X			-						74
MW-416W02	bras	GW	-	11-26-19	1125	3	X	X	X		1						0	15
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	Dand	City/State Collected:			PT MT CT ET		Pres							SDG # 11659	500
escription: GW-Creek Bottom As	Client Project # KCBPU Nearman			Lab Project # KCKAN02-MW	IW NEARMAN2		Sulfate 125mlHDPE-NoPres	250mlHDPE-HNO3	250mlHDPE-NoPres					Table # Acctnum: KCKANO	02
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