2022 Annual Groundwater Monitoring and Corrective Action Report for the Federal Coal Combustion Residuals Rule – Wilson Phase II Landfill

Big Rivers Electric Corporation
D.B. Wilson Generating Station

Project No. 145762
1/19/2023

2022 Annual Groundwater Monitoring and Corrective Action Report for the Federal Coal Combustion Residuals Rule – Wilson Phase II Landfill

prepared for

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Project No. 145762

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TABLE OF CONTENTS

Page No.

1.0 EXECUTIVE SUMMARY 1-1

2.0 INTRODUCTION 2-1
2.1 Purpose and Scope 2-1
2.2 Site Description 2-2
2.3 Program Monitoring Well System 2-2
2.3.1 Operating Permit Monitoring Wells 2-2
2.3.2 Characterization Monitoring Wells 2-3

3.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS 3-4
3.1 Description of the Groundwater Monitoring Program 3-4
3.2 Groundwater Sampling Activities 3-5
3.3 Characterization Monitoring Well Installation Activities 3-6

4.0 DATA EVALUATION 4-1
4.1 Groundwater Flow 4-1
4.2 Estimated Vertical Gradient 4-1
4.3 Sampling Results 4-1
4.4 Statistical Evaluation 4-2
4.5 Conclusion 4-4

5.0 CERTIFICATIONS AND NOTIFICATIONS TO THE OPERATING RECORD ... 5-1

6.0 KEY ACTIVITIES PLANNED FOR 2023 6-1
6.1 Groundwater Monitoring 6-1
6.2 Groundwater Assessment Report 6-1
6.3 Remedy Selection 6-1

7.0 REFERENCES 7-1

TABLES
FIGURES
APPENDIX A – FIELD SAMPLING FORMS
APPENDIX B – MONITORING WELL CONSTRUCTION PROGRESS REPORT
APPENDIX C - ANALYTICAL SUMMARY TABLES
APPENDIX D – LABORATORY ANALYTICAL REPORTS

APPENDIX E –DATA VALIDATION
APPENDIX F – STATISTICAL EVALUATION

LIST OF TABLES

Table No.	Title
1	Summary of Monitoring Well System Construction Details
2	Monitoring Well Network Groundwater Elevations
3	Estimated Vertical Hydraulic Gradients

LIST OF FIGURES

Figure No.	Title
1	Site Location Map
2	Groundwater Monitoring Network – Federal CCR Rule Program
3	Groundwater Contour Map – April 28, 2022
4	Groundwater Contour Map – October 27, 2022

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
ACM	Assessment of Corrective Measures
BREC	Big Rivers Electric Corporation
CCR	Coal Combustion Residuals
CCR Final Rule	*Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule*, dated April 17, 2015, amended July 30, 2018, and on September 28, 2020
CFR	Code of Federal Regulations
GWPS	groundwater protection standard
KAR	Kentucky Administrative Regulation
KDWM	Kentucky Department for Environmental Protection, Division of Waste Management
SSI	statistically significant increase
SSL	statistically significant level
Unit	Wilson Phase II Landfill
USEPA	United States Environmental Protection Agency
Wilson Station / Site	D.B. Wilson Generating Station located in Ohio County, Kentucky

1.0 EXECUTIVE SUMMARY

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2022 at the Big Rivers Electric Corporation (BREC) D.B. Wilson Generating Station (Wilson Station / Site) Phase II Landfill (the Unit) as required by 40 CFR §257.90(e) of the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule. A site figure illustrating the location of the Unit is presented as **Figure 1**. The program monitoring networks for the Unit, including supporting characterization and water level only monitoring wells are summarized in **Table 1** and illustrated on **Figure 2**.

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Unit would require initiation of assessment monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, have downgradient statistically significant increases (SSIs) over background. On February 5, 2018, BREC posted a formal notification that the Unit would transition from baseline detection to an assessment monitoring program. On December 6, 2018, BREC posted a formal notification that one or more constituent in Appendix IV was detected at statistically significant levels (SSLs) above the established groundwater protection standards (GWPS) as required by 40 CFR §257.107(h)(6). On January 14, 2019, BREC posted a formal notification that the Wilson Phase II Landfill would initiate an Assessment of Corrective Measures (ACM) per 40 CFR §257.95(g)(5), fulfilling the requirement of 40 CFR §257.107(h)(7). In June 2019 BREC finalized the ACM in which applicable remedial technologies to address cobalt impacts in groundwater were identified pursuant to Tile 40 CFR §257.96. A report summarizing the results of the ACM (AECOM, 2019b) was posted to BREC's publicly accessible CCR reporting website on July 10, 2019. A public meeting has not been held to date to discuss the results of the ACM for the Wilson Phase II Landfill. BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation for this unit and anticipates providing additional data in future semi-annual remedy selection progress reports.

Groundwater analytical data collected during assessment monitoring at the Unit indicated that Appendix IV constituents were detected in downgradient monitoring wells at SSIs over background. Per CCR Rule requirements, GWPSs for each Appendix IV constituent were developed and the data were tested for whether the concentrations represented SSLs above their respective GWPSs. SSLs identified in the current annual reporting period are as follows:

- Cobalt: MW-10
- Lithium: MW-5, MW-6, and MW-7

Although no additional monitoring wells were installed in 2022 specific to the Phase II Landfill, monitoring well installation activities were initiated in December 2021 in accordance with the Kentucky Department for Environmental Protection, Division of Waste Management (KDWM) approved Groundwater Assessment Plan (Burns & McDonnell, 2021) for the Phase I Special Waste Landfill under 401 Kentucky Administrative Regulation (KAR) Chapter 45 Special Waste Section 160 (KAR 45:160). These new well installations will serve as additional characterization monitoring wells for groundwater monitoring and the data generated from this groundwater assessment are critical to the development of a comprehensive site conceptual model for groundwater, which is needed to evaluate the appropriate remedy for the Phase II landfill ground water impacts. As part of the well installation activities, Characterization Monitoring Well MW-105 was abandoned in December 2021 and replaced with Characterization Monitoring Well MW-105R in December 2021. In addition to the replacement of MW-105, five new Characterization Monitoring Wells, MW-10D, MW-111, MW-112, MW-113, and MW-114, were installed in December 2021 and January 2022 as characterization monitoring wells in the established State groundwater monitoring program at the Site in accordance with 401 KAR 45:160.

Other activities and conditions for the 2022 annual reporting period include:

- Semi-annual assessment groundwater monitoring events were performed in April and September 2022;
- No program transitions (detection to assessment or vice versa) were triggered; Unit remains in assessment monitoring

Anticipated activities for the next 2023 annual reporting period include:

- Completion of two semi-annual assessment groundwater monitoring events;
- Completion of a groundwater assessment for the adjacent Phase I landfill, that will generate data for interpretation of the Phase II site conceptual model;
- Progress towards selection of a remedy for the Unit.

2.0 INTRODUCTION

At the request of BREC), Burns & McDonnell prepared this 2022 Annual Groundwater Monitoring and Corrective Action Report (Report) for the BREC Wilson Station Unit, located in Ohio County, Kentucky. This report was prepared in accordance with §257.90(e) of 40 Code of Federal Regulations (CFR) Part 257 and 261 of the USEPA CCR Rule. The CCR Rule was established to regulate the disposal of CCR produced by electricity generating facilities (USEPA, 2015; USEPA, 2018; USEPA, 2020a; and 2020b).

This Report summarizes all activities related to the CCR Rule groundwater monitoring program at the Unit in 2022. The following sections present a site background summary, a discussion of groundwater monitoring activities performed, a summary of laboratory results, statistical evaluation findings, and conclusions regarding uppermost groundwater conditions in the aquifer system subject to monitoring under the CCR Rule.

As stated in previous Annual Groundwater Monitoring and Corrective Action Reports, statistical results of the Baseline groundwater data indicated that the Unit required initiation of Assessment monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, reported SSIs over background. On February 5, 2018, BREC posted a formal notification that the Unit would enter into an Assessment Monitoring Program, fulfilling the requirement of 40 CFR §257.107(h)(4). On December 6, 2018, BREC posted a formal notification that the Unit would initiate an ACM per 40 CFR §257.95(g)(5), fulfilling the requirement of 40 CFR §257.107(h)(7). A notice of ACM initiation dated January 14, 2019 was posted to BREC's publicly accessible CCR reporting website. In June 2019 BREC finalized an ACM (AECOM, 2019b) to identify applicable remedial technologies to address Appendix IV cobalt impacts in groundwater pursuant to 40 CFR §257.96. A report summarizing the results of the ACM was posted to BREC's publicly accessible CCR reporting website on June 14, 2019.

2.1 Purpose and Scope

This Report has been prepared per 40 CFR §257.90(e) to document the status of the groundwater monitoring and corrective action program at the Unit, 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 sixth annual Report for the Unit.

2.2 Site Description

The Wilson Phase II Landfill is located in Ohio County approximately 5 miles northwest of the town of Centertown, Kentucky (**Figure 1**). The property is located northwest and adjacent to the Wilson Station. The current Wilson Phase II Landfill footprint is approximately 92 acres (**Figure 2**). Adjacent to the

Phase II Landfill on the east is the Wilson Station Phase I Landfill, which is currently being regulated by Special Waste permit by (KDWM under Title 401 KAR Section 45.

The Wilson Phase II Landfill is currently active and raised above adjacent ground to a maximum elevation of approximately 532 feet above mean sea level. The original ground surface within the landfill footprint was an irregular post-mining reclaimed surface.

2.3 Program Monitoring Well System

2.3.1 Operating Permit Monitoring Wells

Prior to implementation of the CCR Rule, a groundwater monitoring well network was already present at the Unit in compliance with the requirements of the facility's operating permit. The existing wells are located along the perimeter of the permitted footprint for the Wilson Phase II Landfill and meet the CCR Rule requirements that downgradient monitoring wells must be located at the waste boundary of the (active) CCR unit, or as close as practical.

Under the requirements stated in the operating permit, five (5) monitoring wells (MW-5, MW-6, MW-7, MW-8 and MW-10) were installed adjacent to the Wilson Phase II CCR Landfill to determine the general direction of groundwater movement and to monitoring groundwater at the site. MW-8 is located north of the landfill and is considered upgradient. MW-5, MW-6 (both west of the landfill), MW-7 (southwest of the landfill) and MW-10 (south of the landfill) are considered downgradient. As-built specifics of each well installation are summarized on **Table 1**. The locations of the groundwater monitoring wells are shown on **Figure 2**. Each well has a dedicated bladder pump and tubing system installed for sampling purposes.

As stated in the CCR monitoring well network certification, the stratigraphic interval considered as the most prominent water-transmitting zone within and adjacent to the Wilson Station is material identified as reclaimed surface mining spoil material comprised of disrupted consolidated sandstone and shale of the Carbondale Formation. The United States Geological Survey (USGS) Geologic Map of the Equality Quadrangle describes underlying bedrock as "Sandstone, siltstone, shale, coal and underclay: Sandstone, light- to medium-gray, fine-grained, massive, micaceous, locally grades into thin-bedded siltstone. Siltstone, light- to medium-gray and yellowish-brown." For purposes of compliance with the CCR Rule groundwater monitoring requirements, this disrupted sequence comprising the unconsolidated mine spoil is considered the uppermost aquifer underlying the Wilson Phase II Landfill.

Details about the monitoring network are presented in the Monitoring Well Completion Report, D.B. Wilson Special Waste Landfill, Solid Waste Permit Number 092-00004, Ohio County, Kentucky (Associated Engineers, Inc., April 13, 2009). Monitoring wells MW-1, MW-2, MW-3, MW-4, P-9, and P-11 are included in the CCR program as "water level only" monitoring points.

Although no additional monitoring wells were installed in 2022 specific to the Phase II Landfill, monitoring well installation activities were initiated in December 2021 in accordance with the KDWM-approved Groundwater Assessment Plan (Burns & McDonnell, 2021) for the Phase I Special Waste Landfill under 401 KAR 45:160. These new well installations will serve as additional characterization monitoring wells for groundwater monitoring and is discussed further in Sections 2.3.2 and 3.3

2.3.2 Characterization Monitoring Wells

To address the requirements of 40 CFR §257.95(g)(1) at the Phase II CCR Landfill, five (5) Characterization monitoring wells (MW-102, MW-104, MW-105, MW-110, and MW-4D) were installed in October 2018 for the characterization of groundwater at locations indicated on **Figure 2**. To address the requirements of 401 KAR 45:160 at the Phase I Special Waste Landfill, six (6) new characterization monitoring wells (MW-10D, MW-105R [replaced abandoned MW-105] and MW-111 through MW-114) in December 2021 through January 2022 for the characterization of groundwater at locations indicated in **Figure 2** and is discussed further in Section 3.3. As-built specifics of each well installation are summarized on **Table 1**.

The characterization monitoring wells, located at projected downgradient positions east, southeast, south, southwest, and west of the Unit, were used to assist in the characterization of the existence, quality, quantity, areal extent, and depth of groundwater degradation, and the rate and direction of migration of CCR contaminants in the groundwater.

The data generated from the ongoing groundwater assessment under 401 KAR 45:160 (Phase I Special Waste Landfill) are critical to the development of a comprehensive site conceptual model for groundwater, which is needed to evaluate the appropriate remedy for the Phase II landfill groundwater impacts.

3.0 GROUNDWATER MONITORING ACTIVITIES AND RESULTS

3.1 Description of the Groundwater Monitoring Program

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Unit would require initiation of Assessment monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, have downgradient SSIs over background. On February 5, 2018, BREC posted a formal notification that the Unit would transition from baseline detection to an assessment monitoring program. On December 6, 2018, BREC posted a formal notification that one or more constituent in Appendix IV has been detected at SSLs above the established GWPS as required by 40 CFR §257.107(h)(6). On January 14, 2019, BREC posted a formal notification that the Wilson Phase II Landfill would initiate an ACM per 40 CFR §257.95(g)(5), fulfilling the requirement of 40 CFR §257.107(h)(7). In June 2019 BREC finalized the ACM in which applicable remedial technologies to address cobalt impacts in groundwater were identified pursuant to Tile 40 CFR §257.96. A report summarizing the results of the ACM (AECOM, 2019b) was posted to BREC's publicly accessible CCR reporting website on July 10, 2019. A public meeting has not been held to date to discuss the results of the ACM for the Wilson Phase II Landfill. BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation for this unit and anticipates providing additional data in future semi-annual remedy selection progress reports.

In 2022, the Unit was in assessment monitoring status. Two groundwater sampling events were conducted at the Unit in 2022, fulfilling the assessment monitoring and characterization sampling requirements of the CCR Rule. The following table summarizes the dates of the sampling events and the wells included in each event.

Event Type	Sampling Event	Dates	Wells Sampled
Assessment	18	April 27, 2022	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7, MW-10
Characterization	7	April 27-28, 2022	Characterization Wells MW-4D, MW-10D, MW-102, MW-104, MW-105R, MW-110, MW-111, MW-112, MW-113, MW-114

Event Type	Sampling Event	Dates	Wells Sampled
Assessment	19	September 26-27, 2022*	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7, MW-10
Characterization	8	September 27-30, 2022	Characterization Wells MW-4D, MW-10D, MW-102, MW-104, MW-105R, MW-110, MW-111, MW-112, MW-113, MW-114

* Monitoring Well MW-7 was resampled on November 11, 2022 for Radium 226/228 due to the original sample lost by the laboratory.

Following the September 2022 sampling event, a total of 19 assessment monitoring events and 8 characterization monitoring events have been performed at Wilson Landfill since 2016. These events were reported on in the *2018 Annual Groundwater Monitoring and Corrective Action Report* (AECOM, 2018), the *2019 Annual Groundwater Monitoring and Corrective Action Report* (AECOM, 2019a), the *2019 Assessment of Corrective Measures under the CCR Rule* (AECOM, 2019b), the *2020 Annual Groundwater Monitoring and Corrective Action Report* (AECOM, 2020), and the *2021 Annual Groundwater Monitoring and Corrective Action Report* (AECOM, 2021).

Monitoring wells were sampled following low-flow sampling techniques developed and incorporated into current operating permits, which are maintained within the operating record at Wilson Station.

3.2 Groundwater Sampling Activities

In 2022, two assessment monitoring events and two characterization sampling events were conducted at the Unit as part of assessment monitoring and characterization sampling activities. These semi-annual groundwater sampling events were performed by BREC personnel in April 27-28, 2022 and September 26-30, 2022.

The depth to groundwater was gauged at each of the wells during the April 2022 and September 2022 sampling events using a decontaminated water level meter. However, the water level gauging performed on September 30, 2022 was after completion of monitoring well purging/sampling and not all water levels in monitoring wells had equilibrated to static resulting in groundwater elevations not representative of natural conditions. Therefore, all monitoring wells were gauged again on October 27, 2022 to collect representative static groundwater elevation data. The measured depth to groundwater level data and the calculated groundwater elevations during the 2022 monitoring events are summarized on **Table 2**.

Prior to groundwater sample collection, monitoring wells were purged using dedicated bladder pumps and low-flow purging/sampling techniques. Wells were purged until stabilization criteria had been met in accordance with the procedures in the current operating permit. Once groundwater parameters stabilized, the Wilson Phase II Landfill monitoring wells were sampled for Appendix III and Appendix IV parameters, in accordance with 40 CFR §257.95(b). No filtration of samples was conducted in either the field or laboratory procedures. Following the September 2022 sampling event, the laboratory lost the radium 226/228 sample for MW-7. On November 11, 2022, MW-7 was resampled for radium 226/228. Monitoring well sampling forms for each of the groundwater monitoring events are included in **Appendix A**. Groundwater samples collected during the 2022 sampling events were submitted to Pace Analytical Services, LLC in Madisonville, Kentucky for laboratory analysis. Laboratory analyses were performed in accordance with approved USEPA methods.

3.3 Characterization Monitoring Well Installation Activities

The Wilson Phase I Landfill and the Wilson Phase II Landfill are regulated under separate regulatory programs. As a result, groundwater data for each unit is evaluated under separate procedures; under 401 KAR 45:160 for Phase I (permitted as a Special Waste Landfill) and under 40 CFR 257 for Phase II (permitted as a CCR Landfill).

In August 2021 the KDWM conditionally approved a Groundwater Assessment Plan (Burns & McDonnell, 2021) for the assessment of groundwater conditions at the adjacent Phase I Special Waste Landfill in response to exceedances of GWPSs under 401 KAR 45:160. The Groundwater Assessment Plan was implemented in December 2021 through January 2022 with the installation of six (6) new characterization monitoring wells that included Monitoring Wells MW-10D, MW-105R (replaced abandoned MW-105) and MW-111 through MW-114 for the characterization of groundwater at locations indicated on **Figure 2**. As-built specifics of each well installation are summarized on **Table 1**. A Monitoring Well Construction Progress Report (Burns & McDonnel, 2022a), included herein as **Appendix B**, was prepared to summarize the well installation activities. The characterization monitoring wells, located at projected cross-gradient and downgradient positions east, southeast, south, southwest, and west of the Unit, were used to assist in the characterization of the existence, quality, quantity, areal extent, and depth of groundwater degradation, and the rate and direction of migration of contaminants in the groundwater in accordance with 401 KAR 45:160.

Groundwater sampling of these newly installed characterization monitoring wells was performed to coincide with the semi-annual groundwater monitoring schedule in 2022 under 40 CFR 257 (Phase II Landfill). The characterization monitoring wells sampled included testing of those analytical parameters

listed in Appendix III and IV of 40 CFR 257. Groundwater data for these new characterization monitoring wells are presented in this Report in Section 4.

The data generated for the Phase I Landfill groundwater assessment are critical and will be used in the development of a comprehensive site conceptual model for groundwater, which will also be utilized to evaluate the appropriate remedy for the Phase II landfill groundwater impacts.

4.0 DATA EVALUATION

4.1 Groundwater Flow

The measured depth to groundwater level data and the calculated groundwater elevations during the 2022 monitoring events are summarized on **Table 2**. The calculated groundwater elevations during April and October 2022 were used to construct a piezometric surface map to illustrate groundwater flow conditions for the uppermost aquifer in **Figures 3** and **4**, respectively. These data are representative of general conditions at the Unit. Overall groundwater flow beneath the footprint of the Wilson Phase II Landfill is to the south and southeast. The predominant groundwater flow direction historically observed at the Unit is to the south-southeast. Groundwater flow beneath the Landfill is influenced by extensive strip-mining and the physical extent of mine spoil deposits. These mine spoil deposits are laterally limited by the remaining bedrock high walls left undisturbed south of the Unit along the north side of State Route 85 and beyond (west of) the western edge of the Wilson Phase II Landfill. Outside the footprint of the Unit, the groundwater flow beneath the Site includes a western component along the eastern portion of the Site, a localized southern component in the vicinity of bedrock Monitoring Wells MW-104 and MW-110, and localized northern components in the vicinity of bedrock Monitoring Wells MW-105R and MW-113.

4.2 Estimated Vertical Gradient

Reviewing comparisons of hydrologic data at paired/nested wells allows an evaluation of estimated vertical hydraulic gradients. The nested well clusters at the Site include two well pairs, Monitoring Wells MW-04/04D and MW-10/10D.

The estimated vertical groundwater gradient is calculated by the following equation:

$$\frac{\textbf{Water Elevation (shallow well) – Water Elevation (deep well)}}{\textbf{Bottom Elevation of Screen (shallow well) – Bottom Elevation of Screen (deep well)}}$$

* A positive gradient identifies a downward gradient, while a negative gradient identifies an upward gradient.

The estimated vertical gradients ranged from -0.00032 upward (MW-4/4D; April 2022) to -0.003 upward (MW-4/4D; October 2022). The estimated vertical gradients are summarized in **Table 3**.

4.3 Sampling Results

During 2022 a total of two assessment monitoring and characterization sampling events were completed. Results from these sampling events are summarized on the tables included in **Appendix C**. Copies of

complete analytical laboratory reports are included in **Appendix D**. Laboratory data was validated and all data are considered viable for reporting as qualified. Copies of data validation reports are provided in **Appendix E**.

4.4 Statistical Evaluation

As part of previous assessment monitoring performed at the Unit, background and downgradient wells for the Phase II Landfill were sampled for Appendix IV constituents from 2018 through 2021. In accordance with 40 CFR §257.95, GWPSs were established for detected Appendix IV constituents. The previous 2021 assessment monitoring results indicate the presence of Appendix IV constituents at SSLs above their respective GWPSs in the following monitoring wells:

- Cobalt: MW-5, MW-6, and MW-10
- Lithium: MW-6

In accordance with 40 CFR §257.93(f), 40 CFR §257.93(h), and 40 CFR §257.95(d)(2), statistical evaluation of the 2022 assessment groundwater data collected to date was conducted as part of developing this statistical evaluation. The evaluation was conducted to identify any 2022 SSIs over baseline concentrations for the Appendix III and Appendix IV parameters and any 2022 SSLs over established GWPSs for detected Appendix IV parameters. A summary of the 2022 statistical evaluation conducted on the Appendix III and Assessment Appendix IV parameters is provided as **Appendix F.**

Statistical methods were chosen in accordance with 40 CFR §257.93(f) and the rationale behind why each method was selected is outlined in the Update to Certification of Statistical Method for Evaluation Groundwater document (Burns & McDonnell, 2022b) dated May 25, 2022. The Appendix III groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the Unit, Monitoring Well MW-8 is designated as the background well because it is located upgradient, whereas Monitoring Wells MW-5, MW-6, MW-7, and MW-10 are designated as compliance wells because they are located downgradient near the Unit waste boundary.

As presented in **Appendix F**, the following Appendix III constituents were observed as SSIs with concentrations above calculated background values in downgradient compliance monitoring wells.

2022 SSIs for Appendix II Detection Monitoring Parameters	
April 2022 Sampling Event	**September 2022 Sampling Event**
Boron (MW-5, MW-6, MW-7, and MW-10)	Boron (MW-5, MW-6, MW-7, and MW-10)
Calcium (MW-5, MW-6, MW-7, and MW-10)	Calcium (MW-5, MW-6, MW-7, and MW-10)
Chloride (MW-5, MW-6, MW-7, and MW-10)	Chloride (MW-5, MW-6, MW-7, and MW-10)
Total Dissolved Solids (TDS) (MW-5, MW-6, MW-7, and MW-10)	Sulfate (MW-10)
--	TDS (MW-5, MW-6, MW-7, and MW-10)

The previously identified Appendix III constituent SSIs for pH (field) at MW-6 and MW-10 (noted for the first time in 2021) and sulfate at MW-5, MW-6, and MW-7 were not verified in 2022. Fluoride and pH did not have any verified SSIs over background. Based on these results, Assessment monitoring is required to continue at the Unit on a semi-annual basis.

As presented in **Appendix F**, the following Appendix IV constituents were observed as SSIs with concentrations above calculated background values in downgradient compliance monitoring wells.

2022 SSIs for Appendix IV Assessment Monitoring Parameters	
April 2022 Sampling Event	September 2022 Sampling Event
Cobalt (MW-10)	Cobalt (MW-10)
Lithium (MW-5, MW-6, MW-7)	Lithium (MW-5, MW-6, MW-7)

The previously identified Appendix IV constituent SSIs for cobalt at MW-5 and MW-6 in 2019 did not reoccur in 2022.

The Appendix IV constituents were further evaluated to determine whether they are present at SSLs over the GWPS by calculating the lower confidence limit (LCL) at 95% confidence for each well and constituent using all of the Baseline, Detection, and Assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS. As presented in **Appendix F**, the following Appendix IV constituents were observed at SSLs over the GWPS.

2022 SSLs Above GWPSs for Appendix IV Assessment Monitoring Parameters	
April 2022 Sampling Event	September 2022 Sampling Event
Cobalt (MW-10)	Cobalt (MW-10)
Lithium (MW-6)	--

The previously identified Appendix IV constituent at SSLs over the GWPS in 2021 for cobalt at MW-5 and MW-6 did not reoccur in 2022. The LCLs for the remaining wells and constituents are equal to or less than the GWPS and thus are not considered SSLs.

On December 6, 2018, BREC posted a formal notification that one or more constituent in Appendix IV has been detected at SSLs above the established GWPS as required by 40 CFR §257.107(h)(6).

4.5 Conclusion

Based upon the statistical evaluation of Appendix III and Appendix IV parameters collected during Assessment Monitoring at the Wilson Phase II Landfill, BREC will continue Assessment Monitoring in 2023.

5.0 CERTIFICATIONS AND NOTIFICATIONS TO THE OPERATING RECORD

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

- *2021 Annual Groundwater Monitoring and Corrective Action Report for the Federal Coal Combustion Residual Rule, Wilson Phase II Landfill* (AECOM, 2022)
- *Update to Certification of Statistical Method for Evaluation Groundwater* (Burns & McDonnell, 2022b)
- *Statistical Evaluation of April 2022 Assessment Monitoring Groundwater Data, D.B. Wilson Station Phase II CCR Landfill* (**Appendix F**)
- *Statistical Evaluation of September 2022 Assessment Monitoring Groundwater Data, D.B. Wilson Station Phase II CCR Landfill* (**Appendix F**)

6.0 KEY ACTIVITIES PLANNED FOR 2023

Anticipated activities for the next 2023 annual reporting period include groundwater monitoring, completion of a Groundwater Assessment Report for the Phase I Special Waste Landfill (generate data for interpretation of the Phase II Landfill site conceptual model), and progress towards selection of a remedy for the Unit.

6.1 Groundwater Monitoring

Continued semi-annual assessment monitoring of all operating permit monitoring wells for the Unit is planned for 2023.

6.2 Groundwater Assessment Report

The Wilson Phase I Special Waste Landfill Groundwater Assessment Report required under 401 KAR 45:160 will be prepared to provide a summary of the new data collected, analysis of data, evaluate the existence, quality, areal extent, and depth of groundwater degradation, the rate and direction of migration of contaminants in groundwater, develop a conceptual site model, evaluate potential for contaminated groundwater to affect downgradient users in the area, and recommendations to abate groundwater contamination from the Phase I Special Waste Landfill.

Although the Groundwater Assessment Report for the Phase I Landfill is required under a separate state regulatory program (401 KAR 45:160) from that of the adjacent Phase II CCR Landfill under the CCR Rule (40 CFR 257), the data generated for the Phase I Landfill groundwater assessment are critical to the development of a comprehensive site conceptual model for groundwater, which will be utilized to evaluate the appropriate remedy for the Phase II CCR Landfill groundwater impacts.

6.3 Remedy Selection

As required by 40 CFR §257.97, BREC is in the process of selecting a remedy for groundwater impacts at the Unit. Currently BREC considers four (4) potential corrective action alternatives as viable options to address groundwater impacts at the Unit. To evaluate each alternative, additional data collection is required. BREC is currently evaluating data collection needs in the following areas to assist with remedy selection:

1. Nature and extent of impact – groundwater trends, influence of non-groundwater remedies, etc.
2. Physical characteristics – available data on the physical characteristics of the landfill and the groundwater environment

3. Performance modeling – data needed to develop digital models demonstrating the effectiveness of potential alternatives
4. Engineering – feasibility, cost estimates, etc.

BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation and anticipates providing additional data in future semi-annual remedy selection progress reports.

Results of the Groundwater Assessment Report (see Section 6.2) will also be used to support progress towards selection of a remedy for the Unit.

The 2023 groundwater monitoring program will continue to assist in evaluating the success of the non-groundwater release remedies implemented at the Unit and will further provide relevant and important information to be considered in supporting the evaluation of the final groundwater remedy selection.

7.0 REFERENCES

AECOM, 2018. 2016-2017 Annual Groundwater Monitoring and Corrective Action Report, D.B. Wilson CCR Landfill, Ohio County, Kentucky.

AECOM, 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, CCR Rule, D.B. Wilson CCR Landfill, Ohio County, Kentucky. January.

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TABLES

Table 1
Summary of Monitoring Well System Construction Details
Phase II CCR Landfill
Big Rivers Electric Corporation - Wilson Station
Ohio County, Kentucky

Well No.		Location* Lat	Long	Reference Elevation* TOIC (feet, NAD27)	GS (feet, NAD27)	Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval (feet, NAD27) Top	Bottom	Screened Interval (feet, NAD27) Top	Bottom	Bottom of Boring (feet, GS)
Phase II CCR Landfill Permitted Monitoring Wells												
MW-5 (8005-3477)	D	37.4638	-87.0910	469.14	467.42	75.0	2 inch / PVC	404.92	391.42	402.92	392.92	76
MW-6 (8005-3476)	D	37.4614	-87.0910	433.06	431.12	53.5	2 inch / PVC	390.42	377.12	388.12	378.12	54
MW-7 (8005-3479)	D	37.4584	-87.0913	426.14	424.08	50.0	2 inch / PVC	386.58	373.18	384.58	374.58	50.9
MW-8 (8005-3475)	U / B	37.4682	-87.0883	471.60	470.01	63.5	2 inch / PVC	419.53	405.96	417.05	407.05	64.05
MW-10 (8005-3478)	D	37.4544	-87.0902	398.91	396.91	22.4	2 inch / PVC	387.16	373.83	384.99	374.99	23.08
Characterization Wells (Screening Use Only)												
MW-4D (8007-4811)	D / C	37.4542	-87.0851	410.02	407.03	96.4	2 inch / PVC	326.03	313.03	324.03	314.03	111
MW-102 (8007-2995)	D / C	37.4613	-87.0757	399.71	396.46	39.3	2 inch / PVC	372.46	360.46	370.46	360.46	36
MW-104 (8007-2994)	D / C	37.4517	-87.0826	392.87	389.76	43.4	2 inch / PVC	361.76	349.26	359.76	349.76	40
MW-105 (8007-2992)**	D / C	37.4516	-87.0973	396.74	393.56	63.3	2 inch / PVC	366.56	333.56	343.56	333.56	60
MW-105R (8007-1175)	U / C	37.4516	-87.0972	397.13	394.11	38.7	2 inch / PVC	371.11	357.94	368.67	358.67	35.33
MW-110 (8007-2996)	D / C	37.4521	-87.0907	393.54	390.56	42.8	2 inch / PVC	362.56	350.56	360.56	350.56	76 / 40
MW-111 (8007-8615)	D / C	37.4593	-87.0982	466.06	463.58	98.5	2 inch / PVC	379.81	367.08	377.81	367.81	105
MW-112 (8007-8614)	D / C	37.4559	-87.0990	403.82	401.15	54.7	2 inch / PVC	361.38	348.65	359.38	349.38	56
MW-113 (8007-1174)	U / C	37.4514	-87.0862	411.61	408.66	58.0	2 inch / PVC	365.89	349.99	363.89	353.89	94
MW-114 (8007-8613)	U / C	37.4510	-87.0760	404.18	401.46	50.7	2 inch / PVC	365.69	351.46	363.69	353.69	56
MW-10D (8007-8616)	D / C	37.4548	-87.0899	399.00	396.27	77.7	2 inch / PVC	333.50	320.77	331.50	321.50	77
Phase I Speical Waste Landfill Monitoring Wells (Water Levels Only)												
MW-1 (8002-9621)	U	37.4667	-87.0852	443.89	442.31	36.3	4 inch / PVC	419.6	407.6	417.6	407.6	36
MW-2 (8002-9622)	D	37.4618	-87.0820	417.11	414.60	36.0	4 inch / PVC	393.3	381.1	391.1	381.1	36
MW-3 (8002-9623)	D	37.4576	-87.0845	411.12	408.19	36.2	4 inch / PVC	387.2	374.9	384.9	374.9	36
MW-4 (8002-9624)	D	37.4546	-87.0850	408.82	406.55	31.3	4 inch / PVC	389.6	377.5	387.5	377.5	31
Water Levels Only												
P-9 (8005-3480)	water level only	37.4622	-87.0867	432.37	429.19	38.7	2 inch / PVC	402.99	389.99	400.99	390.99	39.2
P-11 (8005-3472)	water level only	37.4593	-87.0872	446.55	444.03	68.6	2 inch / PVC	388.43	374.90	385.93	375.93	69.13

Notes:

*Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015, November 2018, and January 2022.

*Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum

** MW-105R abandoned and replaced by MW-105

PVC = Polyvinyl chloride

ID = Internal Diameter

TOIC = Top of internal casing, or measured from (below) TOIC

GS = Ground Surface, or measured from (below) GS

U / B = Upgradient / Background

D = Downgradient

C = Characterization

TABLE 2

MONITORING WELL NETWORK GROUNDWATER ELEVATIONS
WILSON PHASE II CCR LANDFILL

BIG RIVERS ELECTRIC CORPORATION - WILSON STATION
OHIO COUNTY, KENTUCKY

WILSON PHASE II CCR LANDFILL

OPERATING PERMIT GROUNDWATER MONITORING WELLS

	MW-5		MW-6		MW-7		MW-8		MW-10	
Reference Elevation TOIC*(ft, NAD27)	Downgradient 469.14		Downgradient 433.06		Downgradient 426.14		Upgradient/Background 471.60		Downgradient 398.91	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/28/2022	56.15	412.99	41.14	391.92	39.39	386.75	43.64	427.96	13.09	385.82
9/30/2022	56.70	412.44	42.36	390.70	40.40	385.74	44.88	426.72	13.50	385.41
10/27/2022	57.34	411.80	42.68	390.38	40.40	385.74	45.56	426.04	13.40	385.51

CHARACTERIZATION GROUNDWATER MONITORING WELLS

	MW-10D		MW-4D		MW-102		MW-104		MW-105R	
Reference Elevation TOIC*(ft, NAD27)	Characterization 399.00		Characterization 410.02		Characterization 399.71		Characterization 392.87		Characterization 397.13	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/28/2022	13.14	385.86	23.50	386.52	11.03	388.68	6.25	386.62	7.45	389.68
9/30/2022	13.55	385.45	24.40	385.62	11.75	387.96	7.52	385.35	10.48	386.65
10/27/2022	13.43	385.57	24.33	385.69	12.28	387.43	8.21	384.66	8.72	388.41

CHARACTERIZATION GROUNDWATER MONITORING WELLS

	MW-110		MW-111		MW-112		MW-113		MW-114	
Reference Elevation TOIC*(ft, NAD27)	Characterization 393.54		Characterization 466.06		Characterization 403.82		Characterization 411.61		Characterization 404.18	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/28/2022	8.45	385.09	79.71	386.35	17.46	386.36	21.74	389.87	11.84	392.34
9/30/2022	9.40	384.14	80.63	385.43	18.32	385.50	28.11	383.50	16.85	387.33
10/27/2022	9.32	384.22	80.62	385.44	18.25	385.57	22.20	389.41	14.73	389.45

Notes:
1. The water level guaing performed on September 30, 2022 was after completion of monitoring well purging/sampling and not all water levels in monitoring wells had equilibrated to static resulting in groundwater elevations not representative of natural conditions. Therefore, all monitoring wells were gauged again on October 27, 2022 to collect representative static groundwater elevation data.

TABLE 2 (continued)

MONITORING WELL NETWORK GROUNDWATER ELEVATIONS
WILSON PHASE II CCR LANDFILL

BIG RIVERS ELECTRIC CORPORATION - WILSON STATION
OHIO COUNTY, KENTUCKY

	SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS								PEIZOMETERS			
	MW-1		MW-2		MW-3		MW-4		North (P9)		South (P11)	
Reference Elevation TOIC*(ft, NAD27)	Water Level Only 443.89		Water Level Only 417.11		Water Level Only 411.12		Water Level Only 408.82		Water Level Only 432.37		Water Level Only 446.55	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/28/2022	17.65	426.24	17.75	399.36	24.06	387.06	22.32	386.50	24.88	407.49	59.56	386.99
9/30/2022	19.02	424.87	18.49	398.62	25.32	385.80	23.34	385.48	24.77	407.6	61.23	385.32
10/27/2022	19.23	424.66	18.77	398.34	25.18	385.94	23.32	385.50	24.30	408.07	60.93	385.62

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015
Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum
TOIC = Top of internal casing
GW = Groundwater; GS = Ground Surface; NM = Not measured

1. The water level guaing performed on September 30, 2022 was after completion of monitoring well purging/sampling and not all water levels in monitoring wells had equilibrated to static resulting in groundwater elevations not representative of natural conditions. Therefore, all monitoring wells were gauged again on October 27, 2022 to collect representative static groundwater elevation data.

Table 3
Estimated Vertical Hydraulic Gradients
Wilson Phase II CCR Landfill
Big Rivers Electric Corporation - Wilson Station
Ohio County, Kentucky

Well Cluster	Top of Casing Elev (ft amsl)	Total Well Depth (feet bTOC)	Well Screen Elevation Top (ft amsl)	Well Screen Elevation Bottom (ft amsl)	Screened Geologic Formation	Water Depth (ft bTOC)	Water Elevation (ft amsl)	Difference in Water Level (ft)	Vertical Gradient (feet/foot)	
28-Apr-22										
MW-4	408.82	31.30	387.50	377.50	Mine spoils	22.32	386.50	0.02	-0.00032	Upward
MW-4D	410.02	96.40	324.03	314.03	Mine spoils	23.50	386.52			
MW-10	398.91	22.4	384.99	374.99	Mine spoils	13.09	385.82	0.04	-0.00075	Upward
MW-10D	399.00	76.95	331.50	321.50	Mine spoils	13.14	385.86			
30-Sep-22										
MW-4	408.82	31.30	387.50	377.50	Mine spoils	23.34	385.48	0.14	-0.0022	Upward
MW-4D	410.02	96.40	324.03	314.03	Mine spoils	24.40	385.62			
MW-10	398.91	22.4	384.99	374.99	Mine spoils	13.50	385.41	0.04	-0.00075	Upward
MW-10D	399.00	76.95	331.50	321.50	Mine spoils	13.55	385.45			
27-Oct-22										
MW-4	408.82	31.30	387.50	377.50	Mine spoils	23.32	385.50	0.19	-0.0030	Upward
MW-4D	410.02	96.40	324.03	314.03	Mine spoils	24.33	385.69			
MW-10	398.91	22.4	384.99	374.99	Mine spoils	13.40	385.51	0.06	-0.0011	Upward
MW-10D	399.00	76.95	331.50	321.50	Mine spoils	13.43	385.57			

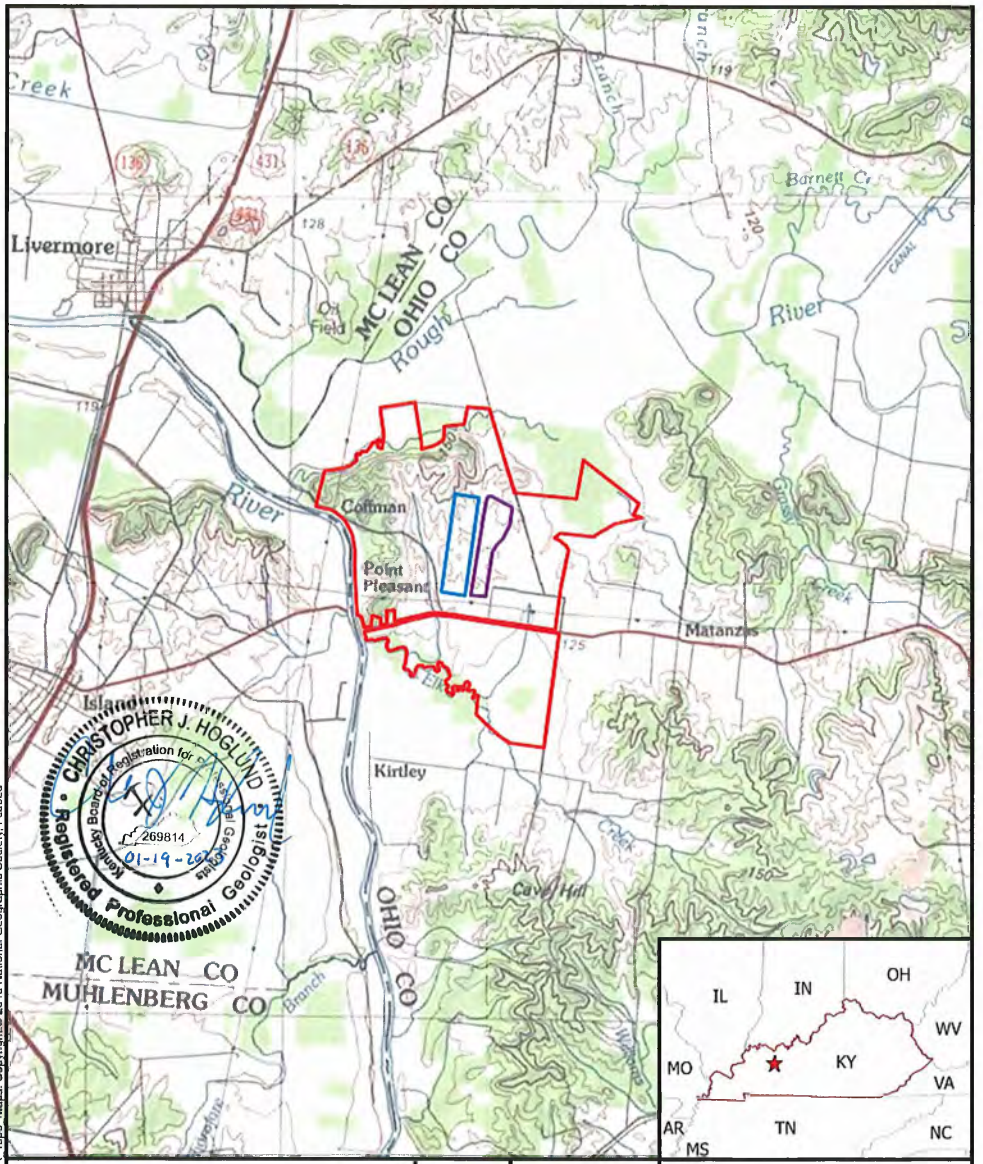
$$\text{Vertical Gradient (ft/ft)} = \frac{\text{(Groundwater Elevation of Shallow Well - Groundwater Elevation of Deep Well)}}{\text{(Bottom Elevation of Shallow Well Screen - Bottom Elevation of Deep Well Screen)}}$$

amsl - above mean sea level (North American Vertical Datum 1988 (NAVD88)
bTOC - below top of casing
ft - feet

Notes:

1. Positive vertical gradient value identifies a downward gradient, while a negative value identifies an upward gradient.

FIGURES



WILSON PHASE I LANDFILL
WILSON PHASE II LANDFILL
PROPERTY BOUNDARY

NORTH

0 2,500 5,000

Scale in Feet

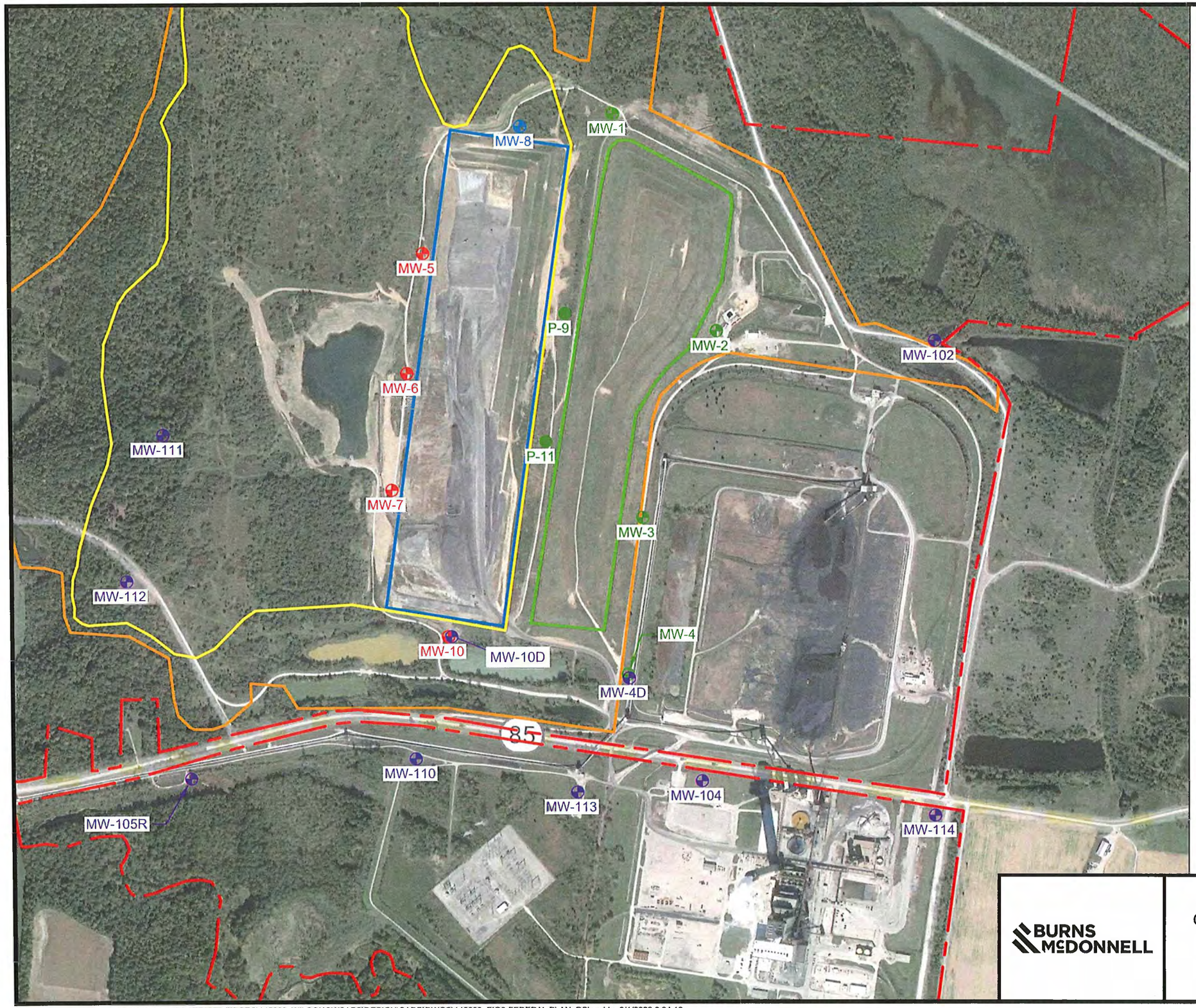
BURNS McDONNELL

FIGURE 1
SITE LOCATION MAP
WILSON STATION
OHIO COUNTY, KENTUCKY

Source: Esri, USGS, Burns & McDonnell Engineering, Inc. BREC

Issued: 8/30/2022

Path: \\bmcd.burnsmcd.com\dfs\Clients\EMS\BigRivers\EC145603_WilsonGWSAPot\Studies\Geospatial\DataFiles\ArcDocs\BREC\BREC.aprx ORParrab 8/30/2022
Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community, Sources: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, 2013 National Geographic Society, i-cubed



LEGEND

- PROPERTY BOUNDARY
- CCR PHASE 2 FILL
- BOND INCREMENT
- KAR PERMIT AREA
- PHASE I LANDFILL

PHASE II CCR LANDFILL PERMITTED MONITORING WELLS:

- UPGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL

CHARACTERIZATION MONITORING WELLS:

- CHARACTERIZATION MONITORING WELL
- MONITORING WELL (WATER LEVEL ONLY)
- PIEZOMETER (WATER LEVEL ONLY)

CHRISTOPHER J. HOGLUND
Kentucky Board of Registration for Professional Geologists
Registered Professional Geologist
TX
269814
01-19-2023

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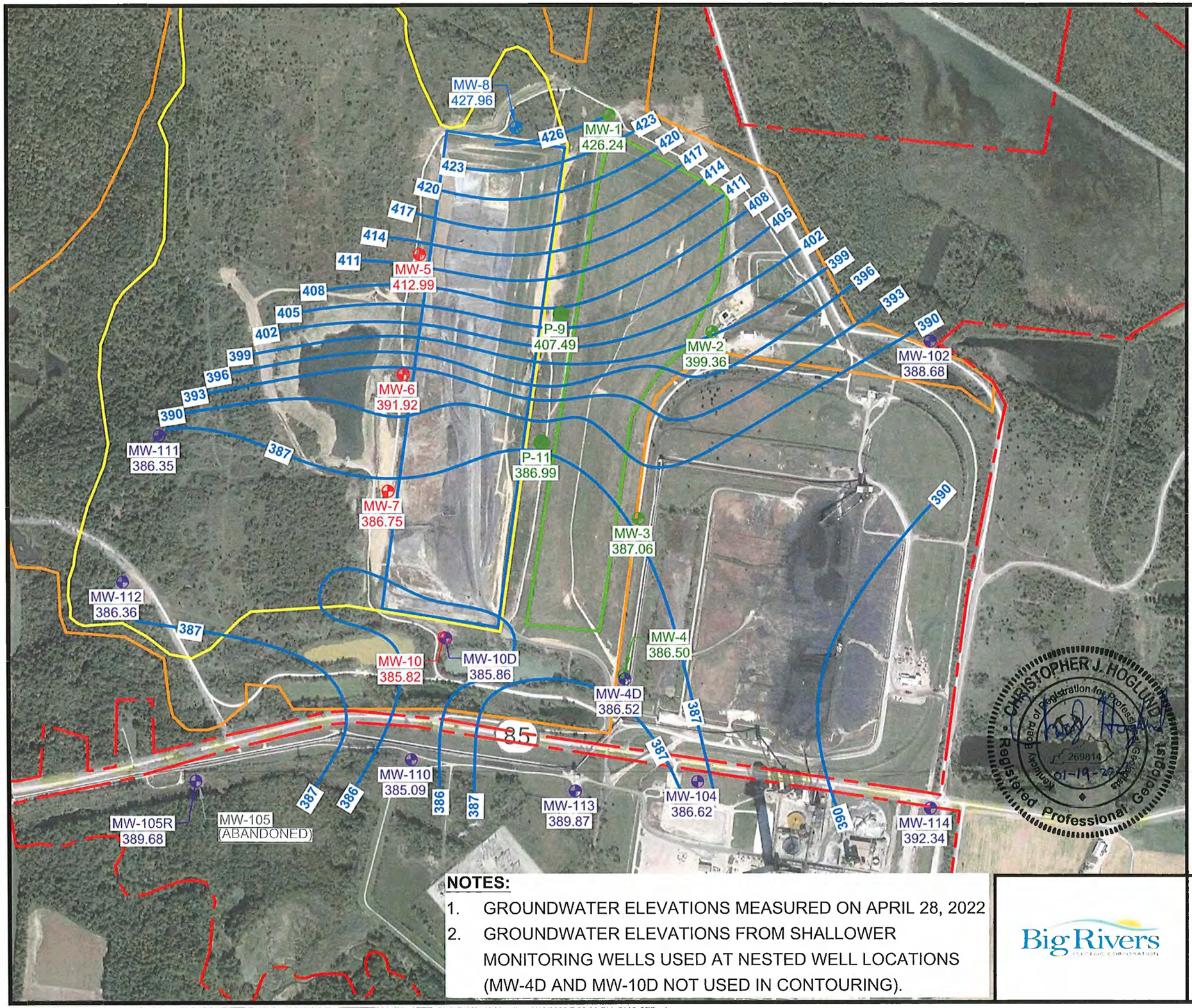
SCALE IN FEET

BURNS McDONNELL

FIGURE 2

GROUNDWATER MONITORING NETWORK
FEDERAL CCR RULE PROGRAM
BREC, WILSON STATION
OHIO COUNTY, KENTUCKY

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LEGEND

- PROPERTY BOUNDARY
- CCR PHASE 2 FILL
- BOND INCREMENT
- KAR PERMIT AREA
- PHASE I LANDFILL

PHASE II CCR LANDFILL PERMITTED MONITORING WELLS:

- UPGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL

CHARACTERIZATION MONITORING WELLS:

- CHARACTERIZATION MONITORING WELL
- MONITORING WELL (WATER LEVEL ONLY)
- PIEZOMETER (WATER LEVEL ONLY)

387.43 GROUNDWATER ELEVATION

390 GROUNDWATER ELEVATION CONTOUR

N

0 800' 1600'

SCALE IN FEET

CHRISTOPHER J. HOGLUND
Kentucky Board of Registration for Professional Geologists
269814
01-19-23
Registered Professional Geologist

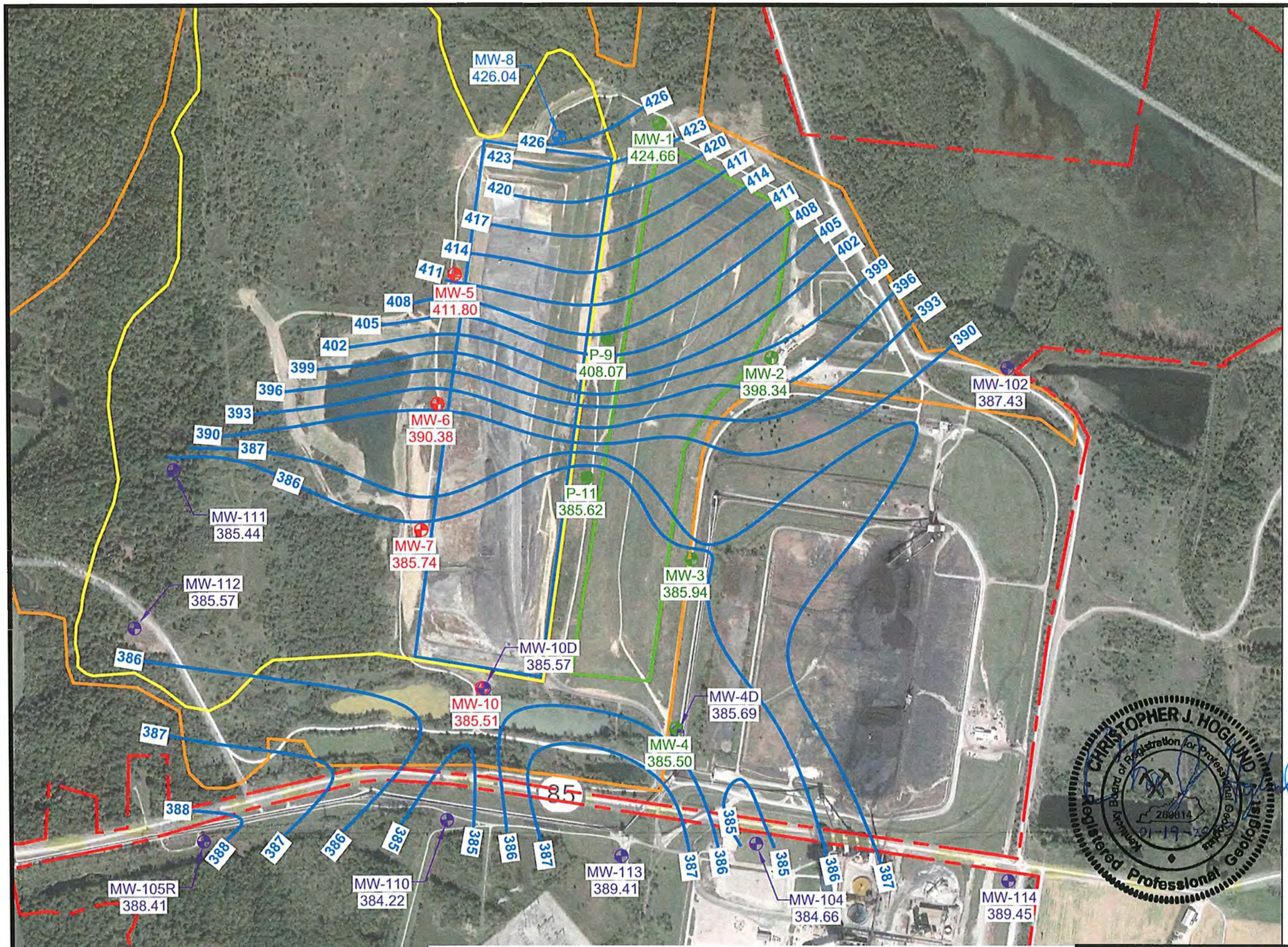
NOTES:

1. GROUNDWATER ELEVATIONS MEASURED ON APRIL 28, 2022
2. GROUNDWATER ELEVATIONS FROM SHALLOWER MONITORING WELLS USED AT NESTED WELL LOCATIONS (MW-4D AND MW-10D NOT USED IN CONTOURING).

Big Rivers

FIGURE 3
GROUNDWATER CONTOUR MAP
BREC, WILSON STATION
OHIO COUNTY, KENTUCKY

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LEGEND

- PROPERTY BOUNDARY
- CCR PHASE 2 FILL
- BOND INCREMENT
- KAR PERMIT AREA
- PHASE I LANDFILL

PHASE II CCR LANDFILL PERMITTED MONITORING WELLS:

- UPGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL

CHARACTERIZATION MONITORING WELLS:

- CHARACTERIZATION MONITORING WELL
- MONITORING WELL (WATER LEVEL ONLY)
- PIEZOMETER (WATER LEVEL ONLY)

387.43 GROUNDWATER ELEVATION

390 GROUNDWATER ELEVATION CONTOUR

N

0 800' 1600'

SCALE IN FEET

CHRISTOPHER J. HOGLUND
Kentucky Board of Registration for Professional Geologists
260614
01-19-23
Registered Professional Geologist

NOTES:

1. GROUNDWATER ELEVATIONS MEASURED ON OCTOBER 27, 2022
2. GROUNDWATER ELEVATIONS FROM SHALLOWER MONITORING WELLS USED AT NESTED WELL LOCATIONS (MW-4D AND MW-10D NOT USED IN CONTOURING).

BURNS McDONNELL

FIGURE 4

GROUNDWATER CONTOUR MAP
BREC, WILSON STATION
OHIO COUNTY, KENTUCKY

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APPENDIX A – FIELD SAMPLING FORMS

Big Rivers ELECTRIC CORPORATION
201 Third Street
P.O. Box 24
Henderson, KY 42419-0024
270-827-2561
www.bigrivers.com

CCR GROUNDWATER FIELD LOG **WILSON LANDFILL**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-4D**	**93.5**	23.50	70	4/27/22	1100

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **410.02**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-4811			386.52	7.0	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog ■ Clear □Partly Cloudy □ Windy Temp. 58 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1020	0	23.55	100	0	17.20	5.34	2.68	6.49	368	1.2
1025	5	23.56		0.5	16.70	6.09	1.28	6.72	346	0.0
1030	10	23.56		1.0	16.77	6.09	1.14	6.88	292	0.0
1035	15	23.57		1.5	16.70	6.09	1.11	7.06	246	0.0
1040	20	23.56		2.0	16.67	6.06	1.10	7.14	231	0.0
1045	25	23.56		2.5	16.63	6.03	1.07	7.25	214	0.0
1050	30	23.57		3.0	16.61	6.01	1.07	7.29	180	0.0
1055	35	23.57		3.5	16.64	6.00	1.08	7.32	179	0.0
1100	40	23.56		4.0	16.63	5.99	1.09	7.34	174	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1100	23.56	cloudy	none	16.63	5.99	1.09	7.34	174	0.0

Big Rivers ELECTRIC CORPORATION

201 Third Street
P.O. Box 24
Henderson, KY 42419-0024
270-827-2561
www.bigrivers.com

Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-5	75.0	56.15	18.85	4.27.22	8:10

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8005-3477		469.14	412.99	3.02	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 43 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
7:35	0	56.15	300	0	15.28	4.13	1.59	5.94	33	9.3
7:40	5	56.15	300	1.5	15.68	4.16	0.78	6.04	-70	8.7
7:45	10	56.15	300	3.0	15.70	4.15	0.71	6.10	-77	4.1
7:50	15	56.15	300	4.5	15.75	4.14	0.65	6.15	-82	2.8
7:55	20	56.15	300	6.0	15.80	4.14	0.57	6.18	-85	2.1
8:00	25	56.15	300	7.5	15.78	4.14	0.49	6.20	-87	1.5
8:05	30	56.15	300	9.0	15.79	4.14	0.44	6.20	-88	1.2
8:10	35	56.15	300	10.5	15.78	4.14	0.41	6.20	-89	1.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	■ Duplicated Collected Time: 8:35
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
8:10	56.15	clear	none	15.78	4.14	0.41	6.20	-89	1.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-6	53.50	41.14	12.36	4-27-22	11:10

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8005-3476		433.06	391.92	1.97	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 43 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
10:10	0	41.24	300	0	15.78	3.24	2.67	6.40	-5	1000
10:15	5	41.37	300	1.5	15.62	3.25	0.71	6.33	-51	716
10:20	10	41.45	300	3.0	15.73	3.25	0.54	6.63	-76	439
10:25	15	41.60	300	4.5	15.69	3.25	0.44	6.49	-77	243
10:30	20	41.80	300	6.0	15.71	3.25	0.40	6.47	-78	151
10:35	25	41.80	300	7.5	15.65	3.25	0.37	6.46	-79	104
10:40	30	41.83	300	9.0	15.73	3.25	0.49	6.44	-80	65.2
10:45	35	41.83	300	10.5	15.67	3.25	0.35	6.44	-81	40.5
10:50	40	41.83	300	12.0	15.75	3.25	0.32	6.44	-81	27.0
10:55	45	41.83	300	13.5	15.79	3.25	0.30	6.43	-82	14.7
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
11:10	41.83	clear	None	15.89	3.24	0.30	6.44	-83	11.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-6**	**53.50**				

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3476**		**433.06**			

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
11:00	50	41.83	300	15	15.89	3.24	0.30	6.43	-83	11.3
11:05	55	41.83	300	16.5	15.86	3.25	0.30	6.43	-83	13.5
11:10	60	41.83	300	18	15.89	3.24	0.30	6.44	-83	11.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
		□ Yes □ No	□ Yes □ No	Filtered: □ Yes □ No	Split Sample □ Yes □ No With:	Semi-Annual □

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-7**	**50.00**	39.39	10.61	4-27-22	14:45

Site Location:	AKGWA#	Casing Diameter ☐4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3479**		**426.14**	386.75	1.69	

☐ Rain ☐ Sleet/Freezing Rain ☐ Snow ☐ Fog ☐ Clear ■ Partly Cloudy ☐ Windy Temp. 63 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
2:00	0	39.71	300	0	17.32	2.56	1.06	6.48	-51	0.0
2:05	5	40.16	300	1.5	16.96	2.60	0.49	6.43	-63	49.7
2:10	10	40.43	300	3.0	16.90	2.67	0.37	6.42	-56	16.2
2:15	15	40.73	300	4.5	16.87	2.69	0.33	6.42	-76	10.0
2:20	20	40.99	300	6.0	16.90	2.71	0.31	6.44	-57	92.5
2:25	25	41.47	300	7.5	16.90	2.72	0.29	6.45	-57	74.1
2:30	30	41.88	300	9.0	16.85	2.74	0.28	6.45	-58	79.2
2:35	35	42.28	300	10.5	16.84	2.74	0.38	6.46	-58	56.9
2:40	40	42.61	300	12.0	16.87	2.75	0.26	6.47	-59	52.0
2:45	45	42.94	300	13.5	16.84	2.75	0.24	6.47	-59	52.2
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ■	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
Good	Good	■ Yes ☐ No	■ Yes ☐ No	Filtered: ☐ Yes ■ No	Split Sample ☐ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
2:45	42.94	clear	none	16.84	2.75	0.24	6.47	-59	52.2

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Auto cal
pH - 3.98
ms/cm - 4.68
Ntu - 0.0
mg/L DO - 12.51

Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-8	63.46	43.64	19.82	4-27-22	6:20

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8005-3475		471.60	427.96	3.17	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 38 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
6:05	0	43.91	200	0	16.65	1.88	0.48	6.29	-104	0.0
6:10	5	44.41	200	1	16.33	1.88	0.43	6.28	-107	0.0
6:15	10	44.73	200	2	16.42	1.87	0.38	6.28	-108	0.0
6:20	15	45.17	200	3	16.50	1.87	0.39	6.28	-108	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes ■ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
6:20	45.17	Clear	None	16.50	1.87	0.39	6.28	-108	0.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-10**	**22.42**	13.09	9.33	4/27/22	800

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3478**		**398.91**	385.82	1.49	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog ■ Clear □Partly Cloudy □ Windy Temp. 40 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
740	Ø	14.35	100	Ø	13.82	3.85	2.90	6.74	36	1.99
745	5	14.98		.5	13.85	3.79	1.92	6.63	51	150
750	10	15.65		1.0	13.83	3.77	1.44	6.33	89	95.2
755	15	16.28		1.5	13.80	3.78	1.46	6.29	94	89.6
800	20	16.91		2.0	13.78	3.78	1.43	6.25	97	87.1
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
800	16.91	cloudy	none	13.78	3.78	1.43	6.25	97	87.1

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-10D**	**76.95**	13.14	63.81	4/27/22	920

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **399.00**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8616**			385.86	10.21	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog ■ Clear □Partly Cloudy □ Windy Temp. 43 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
845	0	13.17	150	0	14.75	1.79	5.16	4.72	360	31.5
850	5	13.15		.75	14.21	3.30	1.25	4.29	226	2.6
855	10	13.16	200	1.5	14.14	3.42	0.75	5.84	103	0.0
900	15	13.15		2.5	14.12	3.45	0.68	6.99	41	0.0
905	20	13.15		3.5	14.11	3.46	0.62	7.04	22	0.0
910	25	13.08		4.5	14.14	3.47	0.60	7.08	13	2.3
915	30	13.10		5.5	14.10	3.48	0.60	7.10	9	0.9
920	35	13.11		6.5	14.09	3.48	0.59	7.11	8	1.2
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
920	13.11	clear	none	14.09	3.48	0.59	7.11	8	1.2

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-102**	**36.5**	11.03	25.47	4-28-22	10:50

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO#
Ohio Co, KY	8007-2995		**399.71**	388.68	4.07	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 68 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
10:10	0	12.45	200		16.25	1.26	2.93	6.93	-52	38.2
10:15	5	12.74	200	1	16.16	1.21	2.78	6.76	-85	12.0
10:20	10	13.10	200	2	16.14	1.22	2.28	6.69	-100	10.2
10:25	15	13.53	200	3	16.19	1.22	1.88	6.65	-107	7.9
10:30	20	13.91	200	4	16.30	1.23	1.71	6.61	-109	6.9
10:35	25	14.41	200	5	16.42	1.23	1.63	6.61	-110	7.7
10:40	30	14.80	200	6	16.45	1.23	1.56	6.60	-110	6.8
10:45	35	15.21	200	7	16.53	1.23	1.50	6.59	-111	7.1
10:50	40	15.60	200	8	16.52	1.23	1.45	6.59	-112	7.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
10:50	15.60	clear	none	16.52	1.23	1.45	6.59	-112	7.0

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-104**	**40.5**	6.25	34.25	4/28/22	1100

Site Location:	AKGWA#	Casing Diameter ☐4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **392.87**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-2994**			386.62	5.48	

☐ Rain ☐ Sleet/Freezing Rain ☐ Snow ☐ Fog ■ Clear ☐ Partly Cloudy ☐ Windy Temp. 65 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1015	0	8.12	100	0	16.28	1.35	1.54	5.73	357	28.5
1020	5	9.45		0.5	16.31	1.33	0.84	6.08	304	12.1
1025	10	10.18		1.0	16.37	1.32	0.80	6.18	292	12.0
1030	15	10.74		1.5	16.37	1.32	0.75	6.24	283	11.7
1035	20	11.39		2.0	16.40	1.32	0.72	6.25	280	10.3
1040	25	11.76		2.5	16.48	1.32	0.68	6.27	276	8.2
1045	30	12.19		3.0	16.50	1.32	0.64	6.25	274	7.6
1050	35	12.72		3.5	16.45	1.32	0.62	6.24	273	6.8
1055	40	13.14		4.0	16.55	1.32	0.59	6.24	271	6.4
1100	45	13.51		4.5	16.51	1.32	0.57	6.24	271	6.3
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ■	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
Good	Good	■ Yes ☐ No	■ Yes ☐ No	Filtered: ☐ Yes ■ No	Split Sample ☐ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1100	13.51	clear	none	16.51	1.32	0.57	6.24	271	6.3

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-105R**	**37.87**	7.45	30.42	4/28/22	915

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-1175**	**397.13**	389.68	4.87		

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog ■ Clear □Partly Cloudy □ Windy Temp. 57 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
855	0	10.23	100	0	15.10	0.862	1.51	5.68	35	66.9
900	5	11.22		0.5	14.89	0.865	1.50	6.11	11	36.4
905	10	12.10		1.0	14.88	0.864	1.48	6.33	6	34.2
910	15	12.96		1.5	14.89	0.863	1.45	6.37	10	35.5
915	20	13.73		2.0	14.87	0.864	1.48	6.38	11	35.2
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
915	13.73		None	14.87	0.864	1.48	6.38	11	35.2

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CCR GROUNDWATER FIELD LOG — **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-110**	**39.5**	8.45	31.05	4/28/22	830

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **393.54**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-2996			385.09	4.97	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog ■ Clear □Partly Cloudy □ Windy Temp. 48 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
750	0	8.66	180	0	15.56	0.410	1.26	4.76	151	18.5
755	5	8.52		0.9	15.58	0.432	0.46	4.89	35	1.3
800	10	8.62		1.8	15.62	0.427	0.35	5.44	-9	49.5
805	15	8.68		2.7	15.64	0.408	0.33	5.81	-26	59.3
810	20	8.65		3.6	15.64	0.377	0.28	6.11	-36	17.5
815	25	8.66		4.5	15.66	0.363	0.28	6.19	-40	26.0
820	30	8.67		5.4	15.69	0.349	0.25	6.18	-46	6.3
825	35	8.64		6.3	15.70	0.339	0.24	6.19	-48	7.4
830	40	8.65		7.2	15.71	0.338	0.24	6.19	-48	7.5
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
830	8.65	clear	none	15.71	0.338	0.24	6.19	-48	7.5

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-111**	**98.31**	79.71	15.6	4-28-22	9:10

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8615**		**466.06**	386.35	2.50	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 46 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
8:10	0	79.71	300	0	15.10	3.74	2.39	6.40	-84	142
8:15	5	79.71	300	1.5	15.30	3.71	1.09	6.38	-82	68.9
8:20	10	79.71	300	3.0	15.33	3.68	0.72	6.39	-83	26.5
8:25	15	79.71	300	4.5	15.38	3.68	0.60	6.41	-86	18.5
8:30	20	79.71	300	6.0	15.43	3.67	0.54	6.42	-88	13.3
8:35	25	79.71	300	7.5	15.47	3.67	0.53	6.42	-88	11.9
8:40	30	79.71	300	9.0	15.52	3.68	0.51	6.41	-88	10.1
8:45	35	79.71	300	10.5	15.57	3.68	0.48	6.40	-89	8.4
8:50	40	79.71	300	12.0	15.60	3.67	0.48	6.41	-89	7.6
8:55	45	79.71	300	13.5	15.66	3.67	0.46	6.41	-90	6.9
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
9:10	79.71	Clear	None	15180	3.66	0.41	6.43	-92	6.8

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-111**	**98.31**				

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **466.06**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8615**					

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
9:00	50	79.71	300	15	15.71	3.67	0.45	6.42	-91	6.7
9:05	55	79.71	300	16.5	15.72	3.67	0.45	6.42	-90	6.4
9:10	60	79.71	300	18	15.80	3.66	0.41	6.43	-92	6.8
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ☐	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
		☐ Yes ☐ No	☐ Yes ☐ No	Filtered: ☐ Yes ☐ No	Split Sample ☐ Yes ☐ No With:	Semi-Annual ☐

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

Auto Cal
pH - 3.97
mS/cm - 4.67
Ntu - 0.0
mg/L DO - 12.46

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-112	54.01	17.46	36.55	4-28-22	7:25

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-8614		403.82	386.36	5.85	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 43 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
6:55	0	17.46	300	0	13.91	1.28	0.75	6.42	-85	51.1
7:00	5	17.46	300	1.5	13.87	1.28	0.49	6.31	-86	42.8
7:05	10	17.46	300	3.0	13.88	1.28	0.41	6.32	-87	21.0
7:10	15	17.46	300	4.5	13.90	1.27	0.37	6.33	-88	20.7
7:15	20	17.46	300	6.0	13.92	1.27	0.35	6.34	-88	17.9
7:20	25	17.46	300	7.5	13.93	1.32	0.34	6.35	-88	17.2
7:25	30	17.46	300	9.0	13.94	1.32	0.34	6.35	-87	17.6
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
7:25	17.46	Clear	None	13.94	1.32	0.34	6.35	-87	17.6

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-113	57.93	21.74	36.19	4/28/22	720

Site Location:	AKGWA#	Casing Diameter ☐4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-1174		411.61	389.87	5.79	

☐ Rain ☐ Sleet/Freezing Rain ☐ Snow ☐ Fog ■ Clear ☐ Partly Cloudy ☐ Windy Temp. 44 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
645	0	26.15	200	0	15.95	0.571	0.55	4.74	362	7.9
650	5	28.13		1.0	15.93	0.490	0.45	4.89	273	2.0
655	10	28.51	100	2.0	15.61	0.503	0.42	5.76	114	1.1
700	15	28.86		2.5	15.61	0.543	0.37	6.13	48	1.6
705	20	29.15		3.0	15.66	0.558	0.35	6.19	22	1.6
710	25	29.38		3.5	15.69	0.563	0.33	6.17	13	1.7
715	30	29.64		4.0	15.69	0.570	0.32	6.17	14	1.8
720	35	29.85		4.5	15.70	0.571	0.31	6.17	13	1.5
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ■	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
Good	Good	■ Yes ☐ No	■ Yes ☐ No	Filtered: ☐ Yes ■ No	Split Sample ☐ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
720	29.85	clear	none	15.70	0.571	0.31	6.17	13	1.5

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CCR GROUNDWATER FIELD LOG **WILSON LANDFILL**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-4D**	**93.5**	24.40	69.1	9-27-22	12:45

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-4811		**410.02**	385.62	11.05	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 68 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
12:15	0	24.40	200	0	19.94	5.28	2.31	6.69	132	0.0
12:20	5	24.40	200	1	19.25	5.28	1.43	6.60	92	0.0
12:25	10	24.40	200	2	18.78	5.31	1.22	6.60	82	0.0
12:30	15	24.40	200	3	18.78	5.28	1.16	6.59	77	0.0
12:35	20	24.40	200	4	18.64	5.21	1.04	6.59	74	0.0
12:40	25	24.40	200	5	18.63	5.18	1.00	6.58	74	0.0
12:45	30	24.40	200	6	18.61	5.17	0.93	6.59	73	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
12:45	24.40	Clear	None	18.61	5.17	0.93	6.59	73	0.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-5**	**75.0**	56.70	18.3	9-26-22	12:10

Site Location:	AKGWA#	Casing Diameter	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3477**	□4" ■2" Conversion fact. 4"-0.67 2"-0.16	**469.14**	412.44	2.92	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 66 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
11:30	0	56.90	250	0	18.92	3.77	3.25	4.75	103	7.1
11:35	5	56.90	250	1.25	18.47	3.74	1.18	4.74	88	2.0
11:40	10	56.90	250	2.50	18.44	3.74	.97	4.74	84	2.1
11:45	15	56.90	250	3.75	18.22	3.74	.84	4.75	82	2.9
11:50	20	56.90	250	5.00	18.23	3.73	.72	4.75	78	4.1
11:55	25	56.90	250	6.25	18.25	3.72	.63	4.75	77	0.3
12:00	30	56.90	250	7.50	18.23	3.73	.56	4.77	76	0.1
12:05	35	56.90	250	8.75	18.27	3.73	.52	4.77	75	0.0
12:10	40	56.90	250	9.00	18.28	3.72	.49	4.76	75	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
12:10	56.90	Clear	None	18.28	3.72	.49	4.76	75	0.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-6**	**53.50**	42.36	11.14	9-26-22	14.45

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3476**		**433.06**	390.7	1.78	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 72 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1:50	0	42.36	250	0	18.63	2.90	3.30	4.76	46	20.3
1:55	5	42.36	250	1.25	18.60	2.92	2.04	4.75	55	18.2
2:00	10	42.36	250	2.50	18.30	2.93	1.11	4.73	68	10.7
2:05	15	42.36	250	3.75	18.33	2.93	.96	4.73	70	6.6
2:10	20	42.36	250	5.00	18.32	2.94	.78	4.75	71	4.6
2:15	25	42.36	250	6.25	18.74	2.92	.68	4.74	71	4.8
2:20	30	42.36	250	7.50	18.33	2.95	.69	4.75	71	3.9
2:25	35	42.36	250	8.75	18.29	2.94	.58	4.76	70	3.5
2:30	40	42.36	250	9.00	18.23	2.95	.59	4.77	71	3.4
2:35	45	42.36	250	10.25	18.21	2.95	.48	4.76	71	1.9
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	■ Duplicated Collected Time: 15:20
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
14.45	42.36	clear	None	18.12	2.95	0.49	4.76	71	2.7

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-6**	**53.50**				

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3476**		**433.06**			

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
2:40	50	42.36	250	11.50	18.15	2.94	.49	4.77	71	2.3
2:45	55	42.36	250	12.75	18.12	2.95	.49	4.76	71	2.7
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
		□ Yes □ No	□ Yes □ No	Filtered: □ Yes □ No	Split Sample □ Yes □ No With:	Semi-Annual □

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

Auto cal
3.96 pH
4.50 ms/cm
0.0 NTU
8.25 mg/L DO

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-7	50.00	40.40	9.6	9-27-22	7:25

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8005-3479		426.14	385.74	1.5	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 43° (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
6:45	0	40.40	250	0	15.73	2.66	3.55	6.54	120	15.2
6:50	5	40.40	250	1.25	15.80	2.68	1.33	6.56	84	14.7
6:55	10	40.40	250	2.50	15.79	2.71	1.08	6.59	72	6.2
7:00	15	40.40	250	3.75	15.80	2.73	0.94	6.60	68	4.1
7:05	20	40.40	250	5.00	15.79	2.73	0.79	6.61	65	1.5
7:10	25	40.40	250	6.25	15.80	2.73	0.76	6.60	62	0.4
7:15	36	40.40	250	7.50	15.84	2.72	0.65	6.59	60	0.0
7:20	35	40.40	250	8.75	15.86	2.72	0.64	6.60	60	0.0
7:25	40	40.40	250	10.00	15.93	2.72	0.60	6.58	58	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
7:25	40.40	Clear	None	15.93	2.72	0.60	6.58	58	0.0

Auto Cal
4.00 pH
5.36 ms/cm
0.0 NTU
10.24 mg/L DO

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-7	50.00	40.34	9.66	11-1-22	11:10

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8005-3479		426.14	385.80	2.51	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 61 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
10:40	0	40.34	200	0	18.64	2.54	5.05	6.77	115	6.4
10:45	5	40.34	200	1	17.55	2.61	1.33	6.64	27	4.1
10:50	10	40.34	200	2	17.37	2.62	0.80	6.64	17	0.1
10:55	15	40.34	200	3	17.36	2.62	0.72	6.65	12	0.0
11:00	20	40.34	200	4	17.33	2.62	0.66	6.65	9	0.0
11:05	25	40.34	200	5	17.31	2.61	0.64	6.65	7	0.7
11:10	30	40.34	200	6	17.36	2.61	0.60	6.65	5	2.2
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
11:10	40.34	clear	none	17.36	2.61	0.60	6.65	5	2.2

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Auto cal
4.02 ph
4.64 ms/cm
0.0 NTU
8.90 mg/L DO

Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-8**	**63.46**	44.88	18.58	9-26-22	8:55

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8005-3475**		**471.60**	426.72	2.97	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 55 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
8:20	0	44.88	200	0	17.26	1.78	4.81	4.78	105	87.6
8:25	5	44.88	200	1	16.78	1.82	1.30	4.64	52	139
8:30	10	44.88	200	2	16.76	1.82	0.95	4.61	42	153
8:35	15	44.88	200	3	16.83	1.80	0.83	4.62	40	171
8:40	20	44.88	200	4	16.82	1.78	0.77	4.64	36	178
8:45	25	44.88	200	5	17.20	1.76	0.68	4.64	31	154
8:50	30	44.88	200	6	17.32	1.76	0.68	4.65	31	155
8:55	35	44.88	200	7	17.33	1.76	0.63	4.67	28	168
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
8:55	44.88	Clear	None	17.33	1.76	0.63	4.67	28	168

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-10	22.42	13.50	8.92	9-27-22	8:35
Site Location:	**AKGWA#**	**Casing Diameter** □4" ■2" Conversion fact. 4"-0.67 2"-0.16	**Measuring Point (ft.)**	**Groundwater Elevation (ft.)**	**Well Vol. (Gal.)**	**PO #**
Ohio Co, KY	8005-3478		398.91	385.41	1.42	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 41 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
8:05	0	15.34	100	0	19.3	3.47	3.77	5.98	130	16.60
8:10	5	17.13	100	.5	19.55	3.47	1.40	5.98	129	17.50
8:15	10	18.00	100	1.0	19.53	3.47	1.32	6.00	139	34.2
8:20	15	18.31	100	1.5	19.47	3.48	1.21	6.04	137	34.4
8:25	20	18.53	100	2.0	19.40	3.50	1.15	6.05	130	29.6
8:30	25	18.73	100	2.5	19.38	3.51	1.22	6.08	127	25.5
8:35	30	18.99	100	3.0	19.43	3.52	1.27	6.10	125	25.8
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	■ Field Blank Collected Time: 8:57	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
8:35	18.99	Clear	None	19.43	3.52	1.27	6.10	125	25.8

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-10D	76.95	13.55	63.4	9-27-22	10:15

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-8616		399.00	385.45	10.14	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 48° (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
9:15	0	13.55	200	0	19.15	3.18	10.57	6.87	56	70.0
9:20	5	13.55	200	1	18.42	3.23	2.42	6.70	45	23.9
9:25	10	13.55	200	2	18.16	3.25	1.19	6.65	39	5.6
9:30	15	13.55	200	3	18.17	3.26	1.59	6.65	36	1.6
9:35	20	13.55	200	4	18.20	3.26	1.14	6.66	33	0
9:40	25	13.55	200	5	18.15	3.26	1.02	6.67	32	0
9:45	30	13.55	200	6	18.20	3.26	0.81	6.67	32	0
9:50	35	13.55	200	7	18.29	3.26	.92	6.66	30	0
9:55	40	13.55	200	8	18.28	3.26	0.82	6.66	29	0
10:00	45	13.55	200	9	18.33	3.26	0.62	6.66	28	0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
10:45	13.55	Clear	None	18.32	3.26	.062	6.67	27	0.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-10D**	**76.95**				
Site Location:	**AKGWA#**	**Casing Diameter** □4" □2" Conversion fact. 4"-0.67 2"-0.16	**Measuring Point (ft.)** **399.00**	**Groundwater Elevation (ft.)**	**Well Vol. (Gal.)**	**PO #**
Ohio Co, KY	**8007-8616**					

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
10:05	50	13.55	200	10	18.32	3.26	0.64	6.67	28	0.0
10:10	55	13.55	200	11	18.33	3.26	.058	6.66	28	0.0
10:15	60	13.55	200	12	18.32	3.26	.062	6.67	27	0.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ☐	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
		☐ Yes ☐ No	☐ Yes ☐ No	Filtered: ☐ Yes ☐ No	Split Sample ☐ Yes ☐ No With:	Semi-Annual ☐

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-102**	**36.5**	11.75	24.75	9-29-22	12:50

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO#
Ohio Co, KY	8007-2995		**399.71**	387.96	3.96	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 64 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
12:15	0	13.84	100	0	18.19	1.27	1.84	6.68	72	5.4
12:20	5	14.60	100	.5	18.88	1.25	1.18	6.67	68	2.1
12:25	10	14.97	100	1	19.12	1.24	0.93	6.67	59	2.7
12:30	15	15.33	100	1.5	19.05	1.25	0.75	6.67	50	1.2
12:35	20	15.61	100	2.0	19.04	1.25	0.61	6.69	42	1.4
12:40	25	15.92	100	2.5	19.13	1.25	0.54	6.65	40	0.2
12:45	30	16.06	100	3.0	19.01	1.25	0.50	6.67	37	1.5
12:50	35	16.37	100	3.5	19.01	1.25	0.48	6.67	34	1.8
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
12:50	16.37	clear	None	19.01	1.25	0.48	6.67	34	1.8

Auto Cal
3.98pH
4.55 mS/cm
0.0 NTU
7.67 mg/L DO

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-104**	**40.5**	7.52	32.98	9-28-2022	1000

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-2994**		**392.87**	375.35	5.27 Oleta	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 54 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
0925	0	7.52	200	0	18.33	2.18	1.12	6.70	50	4.7
0930	5	7.52	200	1	18.27	2.12	.85	6.70	51	3.9
0935	10	7.52	200	2	18.23	2.00	.69	6.71	55	3.1
0940	15	7.52	200	3	18.18	2.00	.61	6.71	56	3.8
0945	20	7.52	200	4	18.17	2.00	.55	6.72	54	4.2
0950	25	7.52	200	5	18.13	2.00	.49	6.72	53	4.3
0955	30	7.52	200	6	18.13	2.01	.47	6.70	53	4.2
1000	35	7.52	200	7	18.12	2.02	.45	6.71	52	4.8
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
good	good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1000	7.52	clear	none	18.12	2.02	0.45	6.71	52	4.8

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CCR GROUNDWATER FIELD LOG — **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-105R**	**37.87**	10.48	27.39	9.29.2022	1110
Site Location:	**AKGWA#**	**Casing Diameter** □4" ■2" Conversion fact. 4"-0.67 2"-0.16	**Measuring Point (ft.)** **397.13**	**Groundwater Elevation (ft.)**	**Well Vol. (Gal.)**	**PO #**
Ohio Co, KY	**8007-1175**			386.65	4.38	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 59 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
10:10	0	12.07	100	0	18.33	1.31	2.54	6.71	43	31.6
10:15	5	12.52	100	0.5	18.30	1.31	1.83	6.73	42	20.9
10:20	10	13.28	100	1.0	18.34	1.30	1.04	6.73	45	8.6
1025	15	14.19	100	1.5	18.33	1.30	.85	6.74	50	7.5
1030	20	14.81	100	2	18.31	1.29	.75	6.74	53	12.3
1035	25	15.58	100	2.5	18.24	1.30	.66	6.75	54	9.5
1040	30	15.98	100	3.0	18.26	1.30	.62	6.75	55	5.3
1045	35	16.53	100	3.5	18.22	1.30	.62	6.73	55	5.0
1050	40	17.13	100	4.0	18.17	1.30	.61	6.73	55	9.5
1055	45	17.48	100	4.5	18.20	1.30	.58	6.72	54	11.5
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	■ Duplicated Collected Time: 1116
good	good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample With: □ Yes ■ No	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1110	18.44	clear	none	18.17	1.30	.50	6.71	53	23.7

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name: **Wilson LF**	Well No. **MW-105R**	Total Depth (ft.) **37.87**	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Site Location: **Ohio Co, KY**	AKGWA# **8007-1175**	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **397.13**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1100	50	17.83	100	5.0	18.18	1.29	.54	6.69	55	15.1
1105	55	18.17	100	5.5	18.16	1.29	.51	6.72	53	21.7
1110	60	18.44	100	6.0	18.17	1.30	.50	6.71	53	23.7
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
		□ Yes □ No	□ Yes □ No	Filtered: □ Yes □ No	Split Sample With: □ Yes □ No	Semi-Annual □

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

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CCR GROUNDWATER FIELD LOG — **Wilson Landfill**

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-110**	**39.5**	9.40	30.1	9.28.2022	

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-2996		**393.54**	384.14	4.81	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 65 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1430	0	9.40	200	0	18.98	.536	.98	6.63	23	66.4
1435	5	9.40	200	1	18.90	.527	.73	6.61	19	27.5
1440	10	9.40	200	2	18.72	.500	.67	6.60	21	27.4
1445	15	9.40	200	3	18.63	.484	.52	6.56	20	25.1
1450	20	9.40	200	4	18.71	.475	.60	6.58	17	19.0
1455	25	9.40	200	5	18.78	.468	.43	6.62	15	12.3
1500	30	9.40	200	6	18.73	.457	.39	6.63	13	9.6
1505	35	9.40	200	7	18.70	.454	.36	6.62	15	12.6
1510	40	9.40	200	8	18.49	.458	.35	6.63	13	7.3
1515	45	9.40	200	9	18.38	.454	.34	6.65	11	4.1
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
good	good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1525	9.40	clear	none	18.47	.453	.32	6.65	12	4.4

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-111**	**98.31**	80.63	17.68	9-30-22	8:30

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8615**		**466.06**	385.43	2.82	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 47 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
7:50	0	80.63	200	0	15.11	3.59	6.69	6.64	77	28.4
7:55	5	80.63	200	1	15.15	3.55	1.34	6.62	65	17.1
8:00	10	80.63	200	2	15.33	3.53	0.99	6.61	62	8.9
8:05	15	80.63	200	3	15.37	3.52	0.81	6.60	62	6.3
8:10	20	80.63	200	4	15.29	3.52	0.73	6.59	60	4.3
8:15	25	80.63	200	5	15.41	3.52	0.66	6.60	58	3.0
8:20	30	80.63	200	6	15.38	3.52	0.60	6.59	58	2.4
8:25	35	80.63	200	7	15.48	3.52	0.62	6.59	57	2.2
8:30	40	80.63	200	8	15.44	3.52	0.66	6.59	57	2.1
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
8:30	80.63	Clear	None	15.44	3.52	0.66	6.59	57	2.1

Auto cal
3.99 ph
41.49 ms/cm
0.0 NTU
8.73 mg/L DO

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-112	54.01	18.32	35.69	9-30 22	6:50

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-8614		403.82	385.50	5.71	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 45 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
6:15	0	18.32	200	0	14.96	1.41	3.02	6.65	196	17.2
6:20	5	18.32	200	1	14.96	1.46	1.10	6.70	79	11.9
6:25	10	18.32	200	2	14.93	1.49	0.89	6.71	68	19.8
6:30	15	18.32	200	3	14.91	1.51	0.78	6.76	59	29.8
6:35	20	18.32	200	4	14.92	1.52	0.69	6.80	50	45.1
6:40	25	18.32	200	5	14.90	1.52	0.63	6.81	47	3.3
6:45	30	18.32	200	6	14.89	1.52	0.66	6.82	44	3.4
6:50	35	18.32	200	7	14.90	1.51	0.61	6.82	44	4.9
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
6:50	18.32	Clear	None	14.90	1.51	0.61	6.82	44	4.9

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CCR GROUNDWATER FIELD LOG **Wilson Landfill**

Site Name: **Wilson LF**	Well No. **MW-110**	Total Depth (ft.) **39.5**	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Site Location: **Ohio Co, KY**	AKGWA# 8007-2996	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **393.54**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1520	50	9.40	200	10	18.41	.456	.33	6.66	12	4.2
1525	55	9.40	200	12	18.47	.453	.32	6.65	12	4.4
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg /l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
		□ Yes □ No	□ Yes □ No	Filtered: □ Yes □ No	Split Sample With: □ Yes □ No	Semi-Annual □

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-113**	**57.93**	28.11	29.82	9-28-2022	1350
Site Location:	**AKGWA#**	**Casing Diameter** □4" ■2" Conversion fact. 4"-0.67 2"-0.16	**Measuring Point (ft.)** **411.61**	**Groundwater Elevation (ft.)**	**Well Vol. (Gal.)**	**PO #**
Ohio Co, KY	**8007-1174**			383.50	4.77	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■Partly Cloudy □ Windy Temp. 64 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1250	0	28.11	200	0	18.42	2.11	1.13	6.57	29	5.2
1255	5	28.11	200	1	18.21	2.08	0.95	6.55	29	2.5
1300	10	28.11	200	2	18.07	2.04	0.96	6.58	25	24.4
1305	15	28.11	200	3	18.12	2.02	0.64	6.57	23	10.3
1310	20	28.11	200	4	18.14	2.03	0.73	6.58	21	22.6
1315	25	28.11	200	5	18.23	2.03	0.67	6.58	20	42.6
1320	30	28.11	200	6	18.03	2.02	0.47	6.59	20	26.9
1325	35	28.11	200	7	18.39	2.07	0.42	6.58	20	13.8
1330	40	28.11	200	8	18.34	2.06	0.41	6.58	21	10.0
1335	45	28.11	200	9	18.22	2.06	0.52	6.61	21	7.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
good	good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1350	28.11	Clear	none	18.13	2.08	0.34	6.62	21	8.2

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-113**	**57.93**				

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-1174**		**411.61**			

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
1340	50	28.11	200	10	18.08	2.08	0.35	6.63	22	14.6
1345	55	28.11	200	11	18.11	208	0.41	6.64	22	10.4
1350	60	28.11	200	12	18.13	2.08	0.34	6.62	21	8.2
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS ☐ Casing PVC ☐	☐ Field Blank Collected Time:	☐ Duplicated Collected Time:
		☐ Yes ☐ No	☐ Yes ☐ No	Filtered: ☐ Yes ☐ No	Split Sample ☐ Yes ☐ No With:	Semi-Annual ☐

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

Auto Cal
3.98 pH
4.55 mS/cm
0.0 NTU
7.67 mg/L DO

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-114**	**50.32**	16.85	33.47	9.28.2022	0825

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **404.18**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8613**			387.33	5.35	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 48 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
0740	0	16.85	200	0	16.69	.986	2.31	6.80	65	1.2
0745	5	16.85	200	1	16.72	.982	3.93	6.77	57	1.5
0750	10	16.85	200	2	16.74	.995	3.89	6.75	57	1.4
0755	15	16.85	200	3	16.78	.987	3.86	6.77	55	1.1
0800	20	16.85	200	4	16.88	.985	3.66	6.75	53	1.1
0805	25	16.85	200	5	16.87	.981	3.66	6.76	52	1.1
0810	30	16.85	200	6	17.00	.978	3.04	6.78	50	0.8
0815	35	16.85	200	7	17.03	.977	2.60	6.77	47	1.0
0820	40	16.85	200	8	17.00	.978	2.54	6.78	46	0.7
0825	45	16.85	200	9	16.98	.977	2.51	6.77	47	1.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	□ Field Blank Collected Time:	□ Duplicated Collected Time:
good	good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
0825	16.85	clear	none	16.98	.977	2.51	6.77	47	1.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	MW-114	50.32	11.84	38.43	4-28-22	12:15

Site Location:	AKGWA#	Casing Diameter □4" ■2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	8007-8613		404.18	392.34	6.15	

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear ■ Partly Cloudy □ Windy Temp. 73 (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
11:15	0	12.81	200	0	17.09	.970	3.01	6.86	-49	10.1
11:20	5	13.16	200	1	16.88	.961	2.11	6.78	-15	6.7
11:25	10	13.47	200	2	16.96	.953	1.67	6.75	-5	6.8
11:30	15	13.77	200	3	17.10	.950	1.42	6.70	-54	5.2
11:35	20	14.17	200	4	17.24	.946	1.28	6.69	-75	5.8
11:40	25	14.52	200	5	17.21	.946	1.10	6.70	-87	9.0
11:45	30	14.90	200	6	17.24	.946	1.02	6.70	-92	6.5
11:50	35	15.30	200	7	17.31	.944	0.97	6.69	-93	10.2
11:55	40	15.74	200	8	17.25	.944	0.94	6.70	-94	7.6
12:00	45	16.16	200	9	17.29	.945	0.90	6.69	-97	10.5
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC ■	■ Field Blank Collected Time: 12:35	□ Duplicated Collected Time:
Good	Good	■ Yes □ No	■ Yes □ No	Filtered: □ Yes ■ No	Split Sample □ Yes ■ No With:	Semi-Annual ■

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
12:15	17.21	Clear	None	17.33	.942	0.86	6.69	-99	9.0

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Groundwater Field Log

Wilson Landfill

Site Name:	Well No.	Total Depth (ft.)	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:
Wilson LF	**MW-114**	**50.32**				

Site Location:	AKGWA#	Casing Diameter □4" □2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) **404.18**	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #
Ohio Co, KY	**8007-8613**					

□ Rain □ Sleet/Freezing Rain □ Snow □ Fog □ Clear □Partly Cloudy □ Windy Temp._____(F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	Sp. Cond. (mS)	DO Mg/L	pH (SU)	eH/ORP (mV)	Turbidity (NTU)
12:05	50	16.44	200	10	17.48	.942	0.87	6.68	-98	13.1
12:10	55	16.88	200	11	17.40	.942	0.86	6.69	-98	10.1
12:15	60	17.71	200	12	17.33	.942	0.86	6.69	-99	9.0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% unless <5 NTU consider stable

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS □ Casing PVC □	□ Field Blank Collected Time:	□ Duplicated Collected Time:
		□ Yes □ No	□ Yes □ No	Filtered: □ Yes □ No	Split Sample □ Yes □ No With:	Semi-Annual □

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)

APPENDIX B – MONITORING WELL CONSTRUCTION PROGRESS REPORT

Monitoring Well Construction Progress Report

Big Rivers Electric Corporation

D.B Wilson Station
Project No. 139018

2/25/2022

Monitoring Well Construction Progress Report

prepared for

Big Rivers Electric Corporation
D.B Wilson Station
Centertown, Kentucky

Project No. 139018

2/25/2022

prepared by

Burns & McDonnell
Kansas City, Missouri

TABLE OF CONTENTS

Page No.

1.0 INTRODUCTION 1-1
1.1 Purpose 1-1
1.2 Regulatory Background 1-1

2.0 SITE BACKGROUND 2-1
2.1 Site Location and Description 2-1
2.2 Geology 2-1
2.3 Report Outline 2-2

3.0 MONITORING WELL INSTALLATION ACTIVITIES 3-1
3.1 Pre-Investigation Activities 3-1
3.1.1 Health and Safety Plan 3-1
3.1.2 Site Access and Permitting 3-1
3.1.3 Utility Clearance 3-1
3.1.4 KDWM Notification 3-2
3.2 Monitoring Well Installation 3-2
3.2.1 Drilling Activities 3-2
3.2.2 Geology Encountered 3-3
3.2.3 Emergency Variance Request 3-4
3.2.4 Monitoring Well Construction and Installation 3-5
3.3 Monitoring Well Abandonment Activities 3-8
3.4 Monitoring Well Development 3-8
3.5 Monitoring Well Surveying 3-9
3.6 Decontamination 3-9
3.7 Investigation-Derived Waste 3-10

4.0 GROUNDWATER OCCURENCE AND FLOW 4-1
4.1 Groundwater Occurrence 4-1
4.2 Estimated Horizontal Gradients and Groundwater Flow 4-1
4.3 Estimated Vertical Gradient and Groundwater Flow 4-2

5.0 SUMMARY AND CONCLUSIONS 5-1

6.0 REFERENCES 6-1

FIGURES
TABLES
APPENDIX A – KDWM GWAP APPROVAL LETTER AND REVISED PERMIT
APPENDIX B – BREC 10-DAY NOTIFICATION LETTER TO KDWM

APPENDIX C - FIELD PHOTOGRAPHS
APPENDIX D – DOWNHOLE CAMERA VIDEOS (ELECTRONIC DELIVERABLE)
APPENDIX E – FIELD LOGBOOK
APPENDIX F – DRILL LOGS
APPENDIX G – KENTUCKY MONITORING WELL VARIANCE REQUESTS
APPENDIX H – MONITORING WELL CONSTRUCTION DIAGRAMS
APPENDIX I – UNIFORM KENTUCKY WELL CONSTRUCTION RECORD
APPENDIX J – MW-105 ABANDONMENT RECORD AND SUPPORTING DOCUMENTS
APPENDIX K - MONITORING WELL DEVELOPMENT FORMS
APPENDIX L – MONITORING WELL SURVEY REPORT

LIST OF FIGURES

Figure No.	Title
1	Site Location Map
2	Monitoring Well and Piezometer Location Map
3	Site Geological Map
4	Mine Spoil Isopach Map
5	Groundwater Surface Map – January 2022

LIST OF TABLES

Table No.	Title
1	Summary of Monitoring Well Construction Details
2	Summary of Groundwater Depths and Elevations January 2022
3	Estimated Vertical Hydraulic Gradients

LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
amsl	Above mean sea level
AST	Above ground storage tank
bgs	below ground surface
BREC	Big Rivers Electric Corporation
Cascade	Cascade Environmental, LP.
CFR	Code of Federal Regulations
CCR	Coal Combustion Residuals
CSM	Conceptual Site Model
EC	electrical conductance
ESA	environmental site assessment
Facility/Site	Big Rivers Electric Corporation's D.B. Wilson Generating Station at 5663 State Route 85 West, Centertown, Ohio County, Kentucky, 42328
feet	ft
FMSME	Fuller, Mossbarger, Scott & May Engineers, Inc.
GWAP	*2021 Groundwater Assessment Plan*
HASP	Health and Safety Plan
HPT	hydraulic profiling tool
HSA	hollow-stem auger
IDW	investigation-derived waste
KAR	Kentucky Administrative Regulation
KDEP	Kentucky Department of Environmental Protection
KDWM	Kentucky Department of Environmental Protection, Division of Waste Management

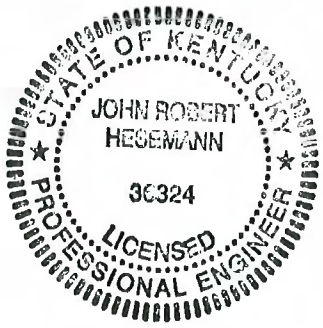
Abbreviation	Term/Phrase/Name
KGS	Kentucky Geological Survey
mg/L	milligrams per liter
µg/L	micrograms per liter
MW	Monitoring Well
MWCPR	Monitoring Well Construction Progress Report
N	nitrogen
NAVD 88	North America Vertical Datum of 1988
NRCS	Natural Resource Conservation Service
OD	Outside Diameter
ppm	parts per million
Report	*Groundwater Monitoring Network Installation Report*
ROW	right-of-way
SWP	Source Water Protection
SWS	State-wide Standards
TNOD	Technical Notice of Deficiency
UAN	urea and ammonia nitrogen
USDA	United States Department of Agriculture

CERTIFICATION

I, John Hesemann, certify that I am a qualified professional in the field of hydrogeology, having received a baccalaureate or post-graduate degree in the natural sciences or engineering, and having sufficient training and experience in groundwater hydrology and related fields, as demonstrated by state registration and completion of accredited university courses, that enable me to make sound judgments regarding groundwater monitoring and contaminant fate and transport.

I further certify that this report, with all its component elements, was prepared by myself or under my direction to verify compliance with Kentucky Administrative Regulation KAR Chapter 6 standards.

John Hesemann
Kentucky Registered Professional Engineer No. 36324
Burns & McDonnell
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Kansas City, Missouri 64114



Monitoring Well Construction Progress Report
February 2022
D.B. Wilson Generating Station
Wilson Special Waste Landfill
Ohio County, Kentucky
Agency Interest No 3319
Activity I.D. Nos. AIN20140001 and ENV20160002

Signature

2/25/2022
Date

1.0 INTRODUCTION

Burns & McDonnell, on behalf of Big Rivers Electric Corp. (BREC), has prepared this *Monitoring Well Construction Progress Report* (Report) for the installation of six additional groundwater monitoring wells at the BREC D.B. Wilson Station Special Waste Landfill located in Ohio County, Kentucky (Site). A Site location map and well location map are provided as **Figures 1 and 2**, respectively.

1.1 Purpose

The additional groundwater monitoring wells were installed in response to the Kentucky Department of Environmental Protection (KDEP), Division of Waste Management's (KDWM) initial request for submittal of a Groundwater Assessment Plan (GWAP) that was issued to BREC in a letter dated March 25, 2014 to address the presence of elevated levels of chloride and pH in groundwater in Monitoring Well MW-1, previously identified as a background well at the Site. The well installation activities and procedures were conducted based on the rationale presented in the KDWM-approved *2021 Groundwater Assessment Plan* (GWAP) (Burns & McDonnell, 2021a). The well installation activities were also performed in general accordance with protocols and procedures specified in the GWAP. The new groundwater monitoring wells will be included as assessment wells in the established State groundwater monitoring program at the Site in accordance with 401 Kentucky Administrative Regulation (KAR) Chapter 45 Special Waste Section 160 (401 KAR 45:160).

1.2 Regulatory Background

The initial request for submittal of a GWAP was issued by the KDWM to BREC in a letter dated March 25, 2014. BREC addressed the initial KDWM request by submitting a GWAP in July 2014.

Following submittal of the initial GWAP, a series of revised GWAP submittals were prepared by BREC and its consultants, followed by corresponding Technical Notice of Deficiency (TNOD) letters issued by KDWM as detailed below:

Date	Author	Document	Subject
July 2014	Civil & Environmental Consultants Inc. (CEC)	GWAP	Initial GWAP response to 3/25/14 KDWM request
March 16, 2015	KDWM	TNOD #1	July 2014 GWAP
October 21, 2015	BREC/CEC	TNOD #1 Response to Comments (RTC)	BREC response to NOD #1
April 15, 2016	KDWM	TNOD #2	July 2014 GWAP and TNOD #1 RTC

Date	Author	Document	Subject
January 13, 2017	BREC/CEC	Revised GWAP	BREC response to NOD #1 and NOD #2
March 8, 2017	KDWM	TNOD #3	Revised 2017 GWAP
June 30, 2017	BREC/CEC	TNOD #3 RTC	TNOD #3
May 2018	AECOM	GWAP	GWAP prepared in response to TNOD #3
May 23, 2019	KDWM	TNOD #4	TNOD #3 RTC and 2018 GWAP
August 16, 2019	BREC/AECOM	TNOD #4 RTC	TNOD #4
October 16, 2019	KDWM	TNOD #5	TNOD #4 RTC
February 26, 2020	BREC/AECOM	TNOD #5 RTC and Revised 2020 GWAP	TNOD #5 RTC and Revised 2020 GWAP
December 11, 2020	KDWM	TNOD #6	TNOD #6
May 11, 2021	BREC / Burns & McDonnell	TNOD #6 RTC and Revised 2021 GWAP	TNOD #6 RTC and Revised 2020 GWAP

Note: Table is intended for summary purposes only and does not provide comprehensive details on each submittal

On May 28, 2018, an Agreed Order was filed between and KDWM which addressed violations associated with leachate outbreaks discharging at D.B. Wilson Station and the protocols for correcting these discharges. All leachate outbreak issues identified in previous TNODs have been or are in the process of being addressed under the Agreed Order.

In October 2018, BREC proceeded with installing characterization monitoring wells to meet the requirements and associated deadlines of Title 40 of the Code of Federal Regulations (CFR) part 257.95 for groundwater characterization under the Federal Coal Combustion Residuals (CCR) Rule. A total of five characterization monitoring wells (designated MW-4D, MW-102, MW-104, MW-105, MW-110) were installed at locations downgradient or cross-gradient (MW-102) from the Wilson Phase I and Phase II Landfills. A *Monitoring Well Construction Progress Report* (AECOM, 2019) (MWCPR) was submitted to KDWM on June 25, 2019 for the installation of the characterization monitoring wells listed above. A separate TNOD was issued by KDWM on October 18, 2019 in response to the MWCPR submittal. Within the MWCPR TNOD, “Advance notice of monitoring well installation for the constructed wells (MW-4D, MW-102, MW-104, MW-105 and MW-110) was not provided to KDWM as required by 401 KAR 6:350 Section 12. As a consequence of this violation of 401 KAR 6:350 Section 12, it is not possible for KDWM to certify that the wells were constructed in accordance with 401 KAR 6:350.” To address the other deficiencies noted in the MWCPR TNOD, a revised MWCPR was submitted to the KDWM on December 17, 2019.

On November 8, 2019, a meeting took place between BREC and KDWM to discuss a path forward to addressing the comments provided by the KDWM in TNOD #4, TNOD #5 and the MWCPR TNOD. During the meeting, KDWM reiterated that proper notification was not provided prior to installing the characterization monitoring wells in October 2018, and therefore the KDWM could not confirm that the wells were constructed in accordance with 401 KAR 6:350. However, the KDWM indicated that they would not object to BREC using the characterization monitoring wells for assessment screening purposes.

On December 11, 2020, BREC received TNOD #6 from KDWM indicating that the 2020 GWAP dated February 28, 2020 (AECOM, 2020) was deficient due:

- Varying terminology that was inconsistent with that specified in KAR (seepage, leachate, leachate outbreaks, leachate-contaminated surface water, contaminated groundwater, and collection/cutoff trench);
- Lack of detail regarding the composition, characteristics, and spatial variation of non-CCR waste and leachate based on existing data;
- Lack of detail needed to demonstrate that monitoring wells would be constructed in accordance with 401 KAR 6:350; and
- Lack of clarity regarding how groundwater results would be evaluated, including the statistical methodology/approach and the use of Monitoring Well MW-8 as the upgradient/background well.

On April 22, 2021, a virtual meeting took place between BREC, Burns & McDonnell and KDWM to discuss BREC's proposed responses to KDWM's comments on the 2020 GWAP dated February 28, 2020 (AECOM, 2020) provided in TNOD #6. BREC's proposed approach to revising the GWAP to satisfy KDWM requirements and achieve approval was also discussed during the meeting. A revised GWAP was submitted to KDWM and conditionally approved in a letter issued by the KDWM on August 4, 2021. Conditions for GWAP approval included in the letter issued by the KDWM were listed on the revised Permit issued August 4, 2021. A copy of the KDWM approval letter and revised Permit are provided in **Appendix A**.

2.0 SITE BACKGROUND

2.1 Site Location and Description

D.B. Wilson Station is located in Ohio County, approximately 5 miles northwest of the town of Centertown, Kentucky (**Figure 1**). The Wilson Landfill is located north of State Route 85, east of the Green River, south of the Rough River, and west of Raymond Nall Road. The Wilson Landfill is permitted under the 401 KAR 45 for disposal of special waste (utility waste such as fly ash, bottom ash, and scrubber sludge per KRS 224.50-760). The landfill consists of two phases, Phase I and Phase II (**Figure 1**). Phase I is located east of an overhead power corridor that runs from north to south, while Phase II is located west of this power corridor.

The current Wilson Phase I Landfill footprint is approximately 103 acres in size (**Figure 1**). The Wilson Phase I Landfill began receiving waste in approximately 1984 and stopped receiving waste in approximately 2010. The Wilson Phase II Landfill is currently active. The original ground surface within the landfill footprint was an irregular post-mining reclaimed surface.

The Wilson Phase I and Phase II Landfills are located on an upland plain east of the Green River at an elevation of approximately 420 feet above mean sea level (amsl), with a maximum elevation of 570 feet amsl. Precipitation falling on the Phase I and Phase II Landfills is directed to ponds on the south, east, and west (Phase II Landfill) sides of the Unit, and then to Elk Creek or to a tributary stream to the Rough River under Kentucky Pollution Discharge and Elimination System permits. Elk Creek is a primary tributary to the Green River and it flows westward to the Green River.

2.2 Geology

The Phase I and Phase II Landfills lie in the Western Kentucky Coalfields section of the Interior Low Plateaus physiographic province, characterized by rolling uplands underlain by coal-bearing bedrock of the Pennsylvanian Period. The Geology underlying the Site vicinity consists of unconsolidated materials, including loess, alluvial deposits, and mine spoil, underlain by Upper to Middle Pennsylvanian-age clastic and carbonate bedrock consisting primarily of sandstone and shale.

The geologic quadrangle (**Figure 3**, Geologic map of the Equality quadrangle, Ohio County, Kentucky, 1969) for the Site vicinity, published by the United States Geological Survey, shows the surficial material to be unconsolidated Quaternary alluvium and Upper Pennsylvanian coal deposits. However, south of State Route 85 these materials consist of silty clay and clayey silt, ranging in thickness from 6 feet (MW-104) to 25 feet (MW-110), while north of State Route 85 the thickness is 36 feet (MW-102). The mine spoil deposits are primarily located north of State Route 85 in the reclaimed mine area. The spoil

deposits consist of a relatively fine-grained matrix of disaggregated, unsorted mixtures of silty clay soils, with gravel-to boulder-sized pieces of sandstone and durable shales resulting from historic strip-mining activities that were subsequently reclaimed with mine spoil backfill. The thickness and distribution of mine spoil, which approximates the physical limits of the uppermost water-bearing zone under the Unit, are illustrated on **Figure 4**. The base of the spoil deposits slopes from north to south, following the base of the number 9 coal bed of the Carbondale Formation as illustrated on **Figure 3**, which was removed by strip mining and subsequently reclaimed with spoil backfill.

Based on borings completed at the Site, the unconsolidated materials are underlain by bedrock of the Middle Pennsylvanian Carbondale Formation. The Carbondale Formation consists of cyclic sequences of sandstones, shales, siltstones, and coals. The Carbondale sediments were deposited in a fluvial-deltaic system. As a result of the depositional environment, the sandstone units of the Carbondale tend to be lenticular bodies rather than continuous sheet-like strata. Regionally, gradational and abrupt horizontal changes in lithology are often encountered.

2.3 Report Outline

The Report has been prepared to provide a summary of the groundwater monitoring well network installed to meet long-term groundwater monitoring objectives at the Site.

This Report includes the following:

- Monitoring Well Installation Activities – Section 3.0
- Groundwater Occurrence and Flow – Section 4.0
- Conclusion – Section 5.0
- References – Section 6.0
- KDWM GWAP Approval Letter and Revised Permit – Included in Appendix A
- BREC 10-Day Notification Letter to KDWM – Included in Appendix B
- Field Photographs – Included as Appendix C
- Downhole Camera Videos – Included as Appendix D (electronic deliverable)
- Field Logbook – Included as Appendix E
- Drill Logs – Included as Appendix F
- Kentucky Monitoring Well Variance Request – Included in Appendix G
- Monitoring Well Construction Diagrams – Included as Appendix H
- Uniform Kentucky Well Construction Record – Included as Appendix I
- MW-105 Abandonment Record and Supporting Documents – Included in Appendix J

- Monitoring Well Development Forms – Included as Appendix K
- Monitoring Well Survey Report – Included as Appendix L

3.0 MONITORING WELL INSTALLATION ACTIVITIES

To support the installation of the groundwater monitoring wells the following field activities were performed in accordance with the Work Plan:

- Advanced six (6) borings to be completed with monitoring wells at six (6) locations.
- Developed monitoring wells.
- Performed in-situ hydraulic conductivity testing at all newly installed monitoring wells.
- Abandoned and replaced Monitoring Well MW-105; and
- Conducted surveying of newly installed monitoring wells.

The monitoring well locations are presented on **Figure 2**. The general approach and results of field activities is presented below. These new groundwater monitoring wells will be included as assessment wells in the established State groundwater monitoring program at the Site in accordance with 401 KAR 45:160.

3.1 Pre-Investigation Activities

Pre-investigation activities included clearing subsurface utilities, obtaining on-site property access, satisfying permit requirements, and preparing a Site-specific Health and Safety Plan (HASP).

3.1.1 Health and Safety Plan

A Site-specific HASP (Burns & McDonnell, 2021b) was developed and implemented during the well installation field activities. The HASP complies with applicable Occupational Safety and Health Administration (OSHA) regulations. No health or safety incidents occurred during the well installation activities.

3.1.2 Site Access and Permitting

Site access, including access to the monitoring well locations within the existing BREC D.B. Wilson Station property, was obtained and coordinated with BREC prior to initiation of field work. No access agreements or permits were needed as all the monitoring wells are located on BREC property.

3.1.3 Utility Clearance

Prior to initiation of field activities, subsurface utilities were located with the aid of BREC personnel and Kentucky One-Call (811 local or 1-800-752-6007), a public utility locating service. BREC was responsible for locating all on-site utilities owned by BREC.

3.1.4 KDWM Notification

In accordance with 401 KAR 6:350 Section 12, BREC provided the KDWM at least 10 days' notice prior to monitoring well construction and abandonment activities associated with the KDWM-approved GWAP. Notification was provided via a letter dated November 15, 2021. A copy of the notification letter is provided in **Appendix B**. Field activities were delayed due to driller availability and the KDWM was notified of the delay and overall schedule impact. A member of the KDWM was present from the start of the field activities and observed drilling and construction of Monitoring Wells MW-105R, MW-113, MW-114, and MW-112, and the abandonment of MW-105.

3.2 Monitoring Well Installation

To address the presence of elevated chloride and pH levels in groundwater, and to remain in compliance with groundwater monitoring requirements by KDWM (401 KAR 45:160), six (6) new monitoring wells were installed as assessment monitoring wells at the Facility in accordance with 401 KAR 6:350. Monitoring wells were installed at locations illustrated in **Figure 2** and consisted of single wells at six (6) locations. These monitoring wells were designed to assess groundwater flow patterns and groundwater quality at the Site. Monitoring well installation activities were conducted from December 7th, 2021 – January 13th, 2022.

The six newly installed wells include Monitoring Wells MW-111 through MW-114, MW-105R, and MW-10D (**Figure 2**). Monitoring Wells MW-111, MW-112, and MW-10D were completed in mine spoils while Monitoring Wells MW-105R, MW-113, and MW-114 were completed in sandstone bedrock.

The purpose of Monitoring Well MW-10D is to provide vertical delineation of groundwater quality impacts detected in the existing shallower Monitoring Well MW-10, screened in mine spoils.

Monitoring Well MW-105R served as a replacement for MW-105, screened in bedrock. A replacement well was needed due to the filter pack in MW-105 extending too far above the top of well screen. Details regarding Monitoring Well MW-105 abandonment are provided in Section 3.3.

3.2.1 Drilling Activities

Soil boring and well installation drilling services were provided by Cascade Environmental LP, a Kentucky-licensed driller and KDWM-certified well contractor, in accordance with 401 KAR 6:350 monitoring well construction practices and standards. Verbal approval was obtained from KDWM to use Thread Armour TJC® by Hole Products as a pipe thread lubricant on the drill rods and casing joints during drilling.

Three (3) monitoring wells, MW-105R, MW-113, and MW-114, were completed in sandstone bedrock. Roto-sonic drilling was used to advance through the unconsolidated overburden above bedrock and a six-inch diameter temporary steel casing (outer drill casing) was advanced into bedrock before switching the roto-sonic rig to wire-line rock coring. Wire-line rock coring was used to retrieve an intact core of the bedrock and the core was examined by the field geologist for potential groundwater pathways (i.e., natural fractures). Each boring was advanced through the sandstone into underlying shale. The depth of shale penetration ranged from 2 feet (MW-105R) and to 6 feet (MW-114). All rock cores recovered during wire-line coring were placed in labeled wooden core boxes stored at the Facility by BREC personnel. Photos of core boxes are included in **Appendix C.** If natural fractures were observed in rock cores, a downhole camera was deployed to further examine potential groundwater pathways. A submersible pump was used to remove water from the core hole to provide improved visibility of the borehole sidewalls during downhole camera deployment. Videos from the downhole camera at MW-105R, MW-113, and MW-114 are included in **Appendix D**.

Monitoring Wells MW-111, MW-112, and MW-10D were completed to the base of the mine spoils. Roto-sonic drilling was used to advance through the mine spoils and into the underlying shale bedrock. During drilling, a six-inch diameter temporary steel casing (outer drill casing) was advanced in each borehole to prevent sloughing (fall-in or hole collapse). At Monitoring Well MW-112, the drilling method switched from roto-sonic to wire-line rock coring at 24 feet bgs after encountering suspected bedrock. However, the rock coring resulted in low recovery and low rock quality designation, with the material consisting of poorly-sorted sandstone and shale cobbles and trace amounts of coal. This material was then interpreted as suspected mine spoils. Each boring was advanced through the mine spoils into underlying shale to confirm that the base of the mine spoils had been reached. The depth of shale penetration ranged from 3 feet (MW-112) to 10 feet (MW-111). No rock cores were retained from the borings completed in the mine spoils due to low recovery. Soil cuttings generated by roto-sonic drilling were placed in containers and staged on-site.

Collection of soil samples for laboratory testing/analysis was not planned or performed, except for sampling unconsolidated drill cuttings for waste characterization (Section 3.7). A copy of the field logbook and drill logs are included in **Appendices E and F**, respectively. The drilling depths for the new monitoring wells are summarized in **Table 1**.

3.2.2 Geology Encountered

The overburden encountered in borings completed for wells located outside of the mine spoil footprint (MW-105R, MW-113, and MW-114) was similar at each location. The upper 2-5 feet of overburden

consisted of a yellowish-brown silt with trace sand and clay. Sand content increased with depth and indurated layers became more present. Bedrock was encountered at Monitoring Well MW-105R and MW-114 at approximately 10-feet bgs, while bedrock at Monitoring Well MW-113 was encountered deeper, at 24.5-foot bgs. A mica and quartz rich sandstone was encountered as the first competent bedrock. The upper 3-5 feet of sandstone was weathered and highly oxidized with iron staining. The iron-stained sandstone transitioned into a light to medium gray, fine grained, quartz and mica rich sandstone ranging from approximately 25 feet (MW-105R) to 70 feet (MW-113) in thickness. The sandstone had few natural fractures with some healed fractures throughout; some organic inclusions/laminations were found at varying depths within the sandstone bedding. Beneath the sandstone was a dark gray to black shale with some fine-grain sandstone interbeds/laminations of unknown thickness.

Monitoring Wells MW-10D, MW-111, and MW-112 were installed near the base of mine spoils. The base of the spoil deposits slopes from north to south, following the base of the number 9 coal bed of the Carbondale Formation as illustrated on **Figure 3**. A mine spoil thickness/distribution (isopach) map is provided in **Figure 4**. As noted above, the mine spoil deposits are dominated by a fine-grained matrix of disaggregated, unsorted mixtures of silty clay soils, with gravel-to boulder-sized pieces of sandstone and durable shales derived from the historic strip-mining activities. Based on this composition, the mine spoils provide a relatively poor-quality water-bearing unit. However, the spoil deposits are the uppermost water-bearing zone for groundwater monitoring purposes under 401 KAR 45:160.

3.2.3 Emergency Variance Request

Due to the use of bentonite chips/pellets, in place of high-solids bentonite grout slurry, for annular seal construction for Monitoring Wells MW-10D, MW-111, and MW-112 (wells completed in mine spoils), three emergency variances were submitted to KDWM. On January 5th, 2022, an emergency variance was requested for MW-112 due to suspected voids in the mine spoils after 200 gallons of high-solids bentonite grout slurry were placed above the bentonite seal and the grout level remained static at 26 feet bgs, resulting in an annular seal thickness of only 6 feet. The KDWM provided verbal variance approval allowing for medium bentonite chips to be used in an attempt to seal off the suspected void(s) before continuing to grout the remaining annulus with high-solids bentonite slurry. Bentonite chips were added to create a 4-foot thick seal and another 75 gallons of bentonite grout slurry were placed in the annulus with still no rise in the grout level. The KDWM subsequently granted approval to use the medium bentonite chips for the remainder of the annular seal. This resulted in a 19-foot thick annular seal comprised of medium bentonite chips. The bentonite chips were added slowly into the borehole through the free fall (gravity) method. During placement of the bentonite chips, the depth to top of bentonite chips was continuously checked/monitored with a tape measure to verify bridging of the bentonite was not

taking place. When the top of bentonite chips were above the water column, five (5) gallons of potable water were added for every one-half bag of chips for hydration.

Two additional emergency variances were requested on January 7th, 2022 for Monitoring Wells MW-111 and MW-10D. These variances were verbally approved by KDWM to allow for the use of 3/8-inch bentonite pellets, rather than a bentonite slurry grout, for constructing annular seals for these wells. This method was used due to the potential for the bentonite grout to migrate through void(s) in the mine spoils, into the underlying well filter pack and screen. The bentonite pellets were added slowly into the borehole using the free fall (gravity) method. During placement of the bentonite pellets, the depth to top of bentonite pellets was continuously checked/monitored with a tape measure to verify bridging of the bentonite was not taking place. When the top of bentonite pellets were above the water column, five gallons of potable water were added for every one-third bucket of pellets for hydration. The thickness of the 3/8-inch bentonite pellet annular seal was 78.8 feet at MW-111, and 54.8 feet at MW-10D. Variance request forms were submitted by the driller to the KDEP on January 20, 2022, copies of which are included in **Appendix G**.

3.2.4 Monitoring Well Construction and Installation

The three bedrock monitoring wells (MW-105R, MW-113, MW-114) were installed in a 4.82-inch diameter core hole and the three monitoring wells completed in mine spoils (MW-111, MW-112, MW-10D) were installed in a 6-inch diameter roto-sonic borehole.

The targeted depth for the placement of the well screens was determined from the total borehole depth, geology encountered during drilling, findings from the downhole camera inspection (if the camera was deployed), measured depth to groundwater in the borehole, and correspondence with KDWM personnel. For wells completed in mine spoils (Monitoring Wells MW-111, MW-112, and MW-10D), the bottom of the well (i.e., base of the end cap) was set approximately one foot into shale bedrock.

Prior to installing Monitoring Wells MW-111, 112, 113, 114 and 10D, the completed boreholes were backfilled with Polymer Drilling Systems Pel-Plug 3/8-in coated, time release, bentonite pellets to place the well screen at the targeted depth above the bottom of the borehole. The bentonite pellets were placed by the gravity free-fall method with the depth of pellets continuously monitored downhole with a weighted tape measure to confirm bridging was not occurring and that the targeted depth was achieved. The bentonite pellets were allowed to hydrate within manufacturer's recommendation of 2-4 hours before placing a 6-inch thick filter pack sand cushion and installing the well. Monitoring Well MW-105R was the only well installed without any backfilling of the borehole.

The well filter pack consisted of Global Drilling Supplies Global Quartz Silica Sand a clean, uniform, 12/20-grade silica sand. Before installing the well, a 6-inch thick filter pack sand cushion was placed in the bottom of the borehole. The well casing, screen and end cap were then placed in the borehole, with the end cap set on top of the filter pack sand cushion.

Wells were constructed with 10-foot long, 0.010-inch machine-slotted screens and threaded end caps. Well construction adhered to requirements of 401 KAR 6:350 Section 7 and 401 KAR 45:160 Section 3(3), except that the well materials consisted of 2-inch diameter Schedule 40 PVC. No glues or solvents were used in the construction of the monitoring wells.

Monitoring Wells MW-111, MW-112, MW-113, and MW-10D were installed at depths greater than 50-foot bgs and therefore included the use of centralizers in accordance with 401 KAR 6:350 Section 7. Centralizers were constructed of stainless steel to provide rust prevention near the screened interval. For each well constructed with centralizers, the first centralizers was placed 11 feet from the bottom of the well to achieve centralizer placement above the well screen and below the bentonite seal. All remaining centralizers were placed on approximate 10-foot centers along the well casing.

Following installation of the well on top of the 6-inch thick filter pack sand cushion at the bottom of the borehole, additional well filter pack sand was placed to at least 2 feet above the top of the well screen. The sand filter pack was placed by the gravity free-fall method with the depth of sand continuously monitored downhole with a weighted tape measure to confirm bridging was not occurring and that the targeted depth was achieved.

A minimum 2-foot thick bentonite pellet seal was placed immediately above the well filter pack sand at Monitoring Wells MW-105R, MW-112, MW-113, MW-114. Bentonite pellets were placed using the gravity free-fall method while continuously monitoring for bridging and pellet depth with a weighted tape measure. The bentonite seal was allowed to hydrate per manufacturer's recommendation (2-4 hours) before placing the annular seal. At wells where the bentonite seal was below groundwater, the pellets were allowed to hydrate in the groundwater for a minimum of 4 hours. Where the bentonite seal was above the water table, potable water was used to hydrate the pellets.

The annular seal for bedrock monitoring wells MW-105R, MW-113, and MW-114 consisted of Haliburton Quik-Grout®, a high-solids bentonite grout slurry. The grout was placed above the bentonite seal, to within 3 feet of the ground surface, using a tremie grout pipe. Per manufacture specifications, the grout was mixed at a ratio of one 50-pound bag to 24 gallons of potable fresh water to create 20% active solids within the mixture. Grout was tremied in place using a grout pipe per 401 KAR 6:350 Section 7,

with the bottom of the pipe placed approximately 0.5-1.0 foot from the top of the bentonite seal. The grout pipe remained at depth until the high solids grout reached the top of the boring. The grout was allowed to settle and if needed, grout was added to achieve a final minimum grout depth of 3 feet bgs. As discussed in Section 3.2.3, a majority of the annular seal for Monitoring Well MW-112 and the entire annular seal for Monitoring Wells MW-111 and MW-10D consisted of hydrated bentonite.

At Monitoring Well MW-114, excess grout mixed nine (9) days prior to grouting was initially used for the annular seal. After discussions with KDWM, the grout was deemed unsuitable for use. KDWM provided approval to flush the grout out of the boring and mix a new batch of bentonite grout for the annular seal. To begin the flushing procedure, a tremie pipe was placed in the borehole annulus to approximately 6 inches from the top of the bentonite seal. Potable water was then pumped through the tremie pipe to force the grout out of the boring into a containment tray at the surface. Once the containment tray was filled, it was pumped out along with water from inside the boring into a storage tank. The process of flushing grout from the boring and pumping water from the boring until dry was repeated five (5) times and approximately 200 gallons of water was used. Approval to re-grout the borehole annulus was given after a visual inspection of the boring by an on-site KDWM representative. New grout was mixed in accordance with manufacturer's specifications and pumped into the boring using the methodology described above.

Monitoring wells were completed above the ground surface in accordance with 401 KAR 6:350 Section 8. Each well casing was constructed to protrude at least 2.5 feet above ground surface and was fitted with a locking steel protective casing. The protective casing was installed by first pouring concrete slurry into the borehole, on top of the annular seal, and then pushing the protective casing into the wet concrete slurry, approximately 2-3 feet bgs. The concrete slurry was brought to the ground surface and a square 3-foot by 3-foot, 6-inch thick concrete pad was constructed around the protective casing, with the casing centered within the pad. The concrete pad was sloped outward to provide a means for water to flow off of the pad and two (2) one-quarter inch weep holes were drilled into the steel protective casing, approximately one-half inch above the concrete pad. Four (4) bollard post were installed at the corners of the well pad to provide protection from vehicle or equipment strikes. Bollards were not located within or in contact with the surface well pad and consisted of 3-inch diameter steel pipes that were 5-foot in length, extending 3 feet above ground surface and 2 feet bgs. The bollards were coated with high-visibility yellow paint and filled with concrete. A water-tight well cap was installed in the top of the well casing and a minimum clearance of one inch was maintained between the top of the well casing and the protective casing to provide secure unobstructive closure of the lid. A minimum clearance of 2 inches was maintained between the outer steel protective casing and the inner well casing and silica sand was used to

fill the open area between the outer protective casing and the inner well casing. Kentucky well tags were affixed to the inside of the protective casing lid.

The well construction details and well diagrams for the new monitoring wells are provided in **Table 1** and **Appendix H**, respectively. A Uniform Kentucky Well Construction Record was completed by Cascade for each new monitoring well and submitted to KDWM. Copies of the well construction records are provided in **Appendix I**.

3.3 Monitoring Well Abandonment Activities

Existing bedrock Monitoring Well MW-105, located away from the reclaimed mine area (outside of the mine spoils), was abandoned since the well cannot be used for groundwater assessment due to an excessive filter pack extended approximately 23 feet above the top of the well screen, spanning across the shale bedrock and into the overlying sandstone. This well was decommissioned (abandoned) in accordance with 401 KAR 6:350 Section 11 and was replaced with newly installed Monitoring Well MW-105R (located approximate 15 feet northeast of MW-105). The monitoring well was abandoned by over-drilling using roto-sonic drilling methods to the constructed well depth of 60 feet bgs. The roto-sonic drill rig was positioned so that the drill bit and casing were centered over the top of the monitoring well. The outside diameter (OD) of the over-drilled borehole was 6-inches, equivalent to the original monitoring well borehole diameter. Cuttings were examined at the surface to confirm the presence of well construction materials (i.e., cement-bentonite grout, filter pack sand, PVC casing). Once the well construction materials had been removed, the over-drilled borehole was filled with high solids bentonite slurry grout, from the bottom of the boring to within 3 feet bgs, using the tremie placement methods described above. The top 3 feet of the borehole were backfilled with materials consistent with the surrounding ground surface.

The well construction details for the abandoned Monitoring Well MW-105 is provided in **Table 1**. A Uniform Kentucky Well Construction Record for the MW-105 abandonment was completed by Cascade and submitted to KDWM. Copies of the MW-105 plugging report, Uniform Kentucky Well Construction Record, well diagram, and drill log are provided in **Appendix J**.

3.4 Monitoring Well Development

Well development was performed on all six newly installed monitoring wells, prior to in-situ hydraulic conductivity testing, to remove fine-grained material from the well screen and filter pack. Development was accomplished by surging and pumping the monitoring wells using a submersible pump.

The monitoring wells completed in bedrock (MW-113, MW-114 and MW-105R) were each developed 3 separate times, with the well being pumped dry during each development event. These wells were allowed to recharge to at least 90% of the static water level prior to beginning each successive purging event. Field water quality parameters of turbidity, pH, conductivity and temperature were measured at the beginning of development and then again when the water level had dropped approximately 50%. Final water quality parameter readings were recorded after the well was nearly dry. Due to the low-yield of these bedrock monitoring wells, well development was considered completed after pumping the wells dry 3 times.

Monitoring wells completed in the mine spoils (MW-111, MW-112 and MW-10D) all had high rates of recharge, allowing for uninterrupted development. During development of these wells, the previously listed water quality parameters were measured after each pumped well volume. Well development was considered complete after a total of three well volumes were pumped from each well. Data collected during the development of each well was recorded on a Well Development Form, copies of which are included in **Appendix K**.

3.5 Monitoring Well Surveying

The monitoring wells were surveyed for both vertical and horizontal control. Surveying was performed by Associated Engineers of Madisonville, Kentucky, a Kentucky-licensed Professional Land Surveyor, on January 12, 2022. The monitoring well locations were surveyed horizontally to the nearest 0.1 foot and referenced to a facility-specific local coordinate system (northing and easting) and Kentucky State Plane, Southern Zone for latitude/longitude coordinates. The monitoring well locations were surveyed vertically using an established surveyed benchmark referenced to the North American Datum 1927. The ground surface elevation at each monitoring well location was measured to the nearest 0.1 foot relative to mean sea level and reported using a Facility-specific datum from an established surveyed benchmark. The top of the monitoring well riser pipe was surveyed to the nearest 0.01 foot relative to mean sea level. The surveying report prepared by Associated Engineers is provided in **Appendix L**.

3.6 Decontamination

Drilling equipment and tools and other non-disposable sampling equipment used for subsurface soil sampling and well installations were decontaminated with a Hotsy® hot water pressure washer prior to drilling operations and between boring and monitoring well locations. A centralized decontamination pad was constructed near MW-113 and all decontamination fluid was contained within the pad by a polyvinyl lining. Decontamination fluids were pumped from the decontamination pad and transferred into an

on-Site fractionation tank. Decontamination fluids and monitoring well purge water were managed in accordance with IDW procedures specified in Section 3.7.

3.7 Investigation-Derived Waste

Excess soil cuttings resulting from the drilling operations through soil overburden (non-mine spoils) were disposed of on the ground surface near the associated boring/well location. Excess soil cuttings consisting of mine spoils generated during drilling at Monitoring Well MW-111, MW-112, and MW-10D locations were containerized in United Nations rated 55-gallon steel drums and staged on-site.

Liquid investigation-derived waste (IDW) generated during the monitoring well installation activities consisted primarily of decontamination water and groundwater purged during well development. Liquid IDW was containerized in a 21,000-gallon fractionation tank staged on-site.

The mine spoil drill cuttings and liquid IDW will be disposed of by BREC following review of IDW characterization sampling results.

4.0 GROUNDWATER OCCURENCE AND FLOW

4.1 Groundwater Occurrence

Groundwater level data was collected from all new and existing monitoring wells at the Site on January 12-13, 2022. Groundwater levels were measured using a decontaminated, battery-operated, electronic water level probe. The depths to groundwater measured in the monitoring wells ranged from 5.97 feet below top of casing (bTOC) at MW-104 to 79.75 feet bTOC at MW-111, with an average of approximately 25 feet bTOC. Groundwater elevations calculated using the measured water levels and surveyed top of well casing elevations ranged from 426.0 feet amsl at MW-1 to 385.2 feet amsl at MW-110, with an average of approximately 394 feet amsl. Groundwater level and elevation data are summarized in **Table 2**. Future water level gauging of the groundwater monitoring network will be performed during semi-annual monitoring events to further evaluate both static groundwater levels and groundwater fluctuations at the Site.

4.2 Estimated Horizontal Gradients and Groundwater Flow

Potentiometric surface contours were generated using the January 2022 groundwater elevation data described in Section 4.1. A map presenting groundwater elevations for each well and depicting the potentiometric surface contours and groundwater flow direction, denoted by arrows drawn perpendicular to the potentiometric contour lines, is included as **Figure 5**. The potentiometric surface depicted in the figure represents the uppermost groundwater surface within the bedrock and mine spoil hydrostratigraphic units at the Site. Based on the data presented on Figure 5, groundwater beneath the Site generally to the south-southwest, with a western component near the southeastern boundary of the Site, localized northern components in the vicinity of Monitoring Wells MW-105R and MW-113, and southeastern flow near Monitoring Wells MW-1, MW-2, and MW-102. Future water level gauging will be performed during subsequent monitoring events to further evaluate groundwater flow direction under static conditions, and to evaluate variations in groundwater flow patterns beneath the Site.

The locations of the six newly installed groundwater monitoring wells, relative to the site boundary and groundwater directions observed at the Site in January 2022, are as follows:

- Monitoring Wells MW-114, MW-113, and MW-105R, located south of Route 85 West, are hydraulically upgradient of the CCR waste boundary.
- Monitoring Wells MW-111 and MW-112, located near the western site boundary, are hydraulically downgradient of the CCR waste boundary.

4.3 Estimated Vertical Gradient and Groundwater Flow

Vertical gradients can be estimated using hydrologic data obtained from paired/nested monitoring wells. Two nested well pairs are currently present at the Site – Monitoring Wells MW-4/4D and Monitoring Wells MW-10/10D.

The estimated vertical groundwater gradient is calculated as follows:

$$\frac{\textbf{Groundwater Elevation (shallow well) – Groundwater Elevation (deep well)}}{\textbf{Bottom of Screen Elevation (shallow well) – Bottom of Screen Elevation (deep well)}}$$

* A positive value identifies a downward gradient, while a negative value identifies an upward gradient.

The estimated vertical gradients were minimal, ranging from -0.0011 upward (MW-10/10D) to -0.00063 upward (MW-4/4D). The estimated vertical gradients are summarized on **Table 3**.

5.0 SUMMARY AND CONCLUSIONS

Six (6) new monitoring wells were installed at the Site, in accordance with 401 KAR 6:350, from December 7th, 2021 – January 13, 2022, to address the presence of elevated chloride and pH levels in groundwater, and to remain in compliance with groundwater monitoring requirements specified by KDWM (401 KAR 45:160). The monitoring wells were designed and installed to assess groundwater flow patterns and groundwater quality at the Site. Monitoring Wells MW-111, MW-112, and MW-10D were completed in mine spoils while Monitoring Wells MW-105R, MW-113, and MW-114 were completed in sandstone bedrock. The well installation activities were conducted based on the rationale presented in the KDWM-approved 2021 GWAP, and in general accordance with protocols and procedures specified in the GWAP.

The newly installed groundwater monitoring wells will be used as characterization wells to complete groundwater assessment at the Site in accordance with 401 KAR 45:160 Section 5. The monitoring wells will be purged and sampled using low-flow sampling methods in accordance with the operating-permit *Groundwater Monitoring Plan*, D.B. Wilson Special Waste Landfill Facility, Solid Waste Permit Number 092-00004, Ohio County dated February 1994 (Fuller, Mossbarger, Scott & May Engineers, Inc. [FMSME]), as amended in October 2002 (FMSME, 2002) and March 2017 (Associated Engineers, Inc., 2017). Two rounds of sampling, including both existing and new characterization wells, will be conducted in 2022 as part of the permit-required semiannual groundwater monitoring program.

The samples collected from the characterization monitoring wells will be analyzed for the same parameters required under the semi-annual monitoring schedule for the Wilson Landfill, as stipulated in the August 4, 2021 Solid Waste Permit (SW09200004), and include those parameters listed in Appendix III and IV of 40 CFR 257. In addition to the permit-required parameters, the characterization wells will be sampled for alkalinity (as bicarbonate and carbonate), magnesium and potassium.

Following the completion of semi-annual sampling and an evaluation of the results, a Groundwater Assessment Report will be prepared in accordance with 401 KAR 45:160, Section 5 and submitted to the KDWM for review.

6.0 REFERENCES

AECOM (2019). Monitoring Well Construction Progress Report CCR Monitoring Program, Phase II Landfill, D.B. Wilson Generating Station, Ohio County, Kentucky, Agency Interest No. 3319, Application I.D. No. AIN20140001. June 25th, revised December 17th.

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Burns & McDonnell (2021a). 2021 Groundwater Assessment Plan, D.B. Wilson Station, Wilson Special Waste Landfill, Ohio County, Kentucky, Agency Interest No. 3319, Application I.D. No. AIN20140001. May.

Burns & McDonnell (2021b). Safety & Health Program 2021 Groundwater Assessment Plan, Kentucky. November.

FMSME (1997), Groundwater Sampling Protocol, Special Waste Landfill Facility, D.B. Wilson Station, Ohio County, Kentucky. March.

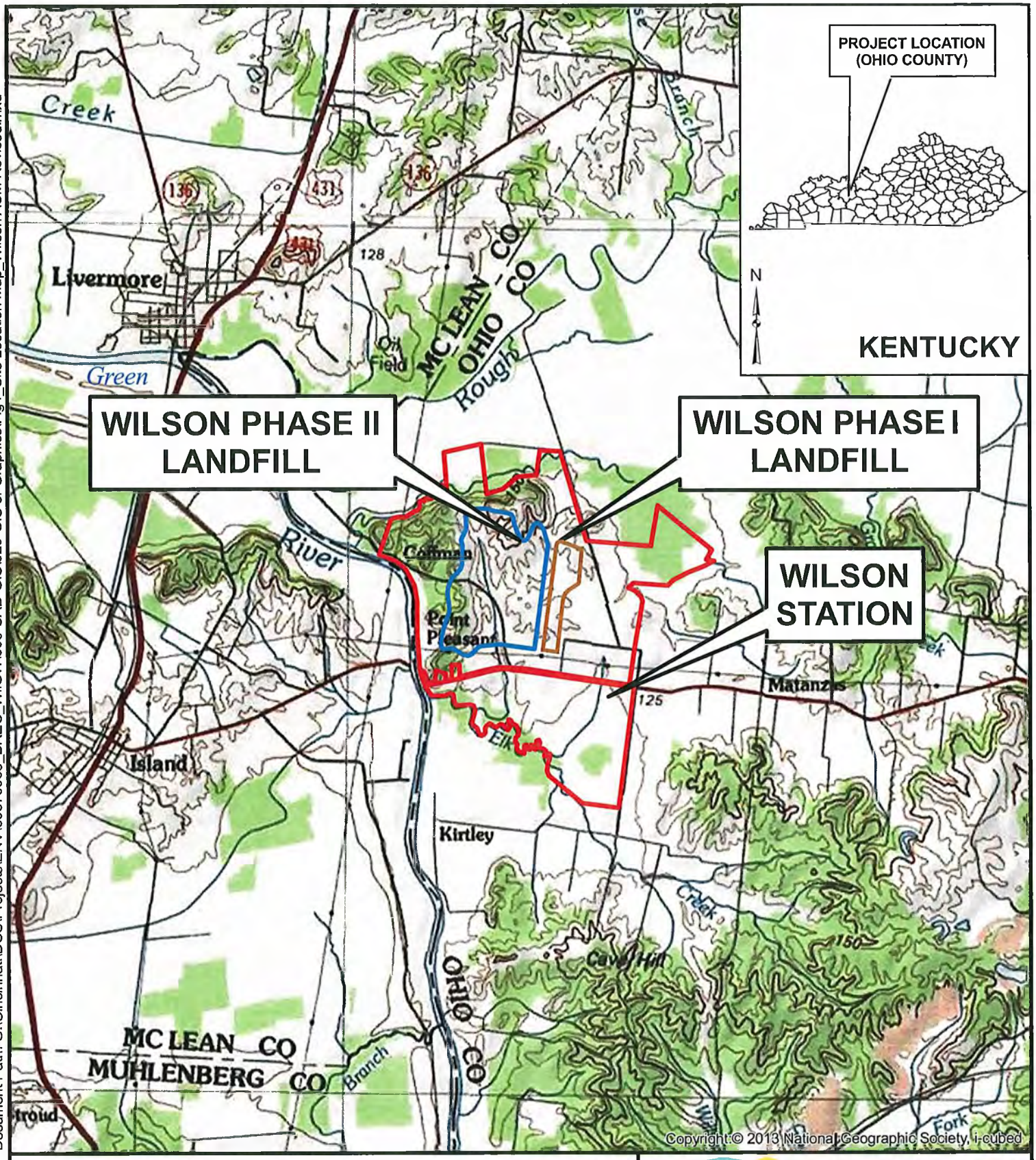
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Gus H. Goudarzi (1969). Geologic Map of the Equality Quadrangle, Western Kentucky, Department of Interior, United States Geological Survey, GQ-815.

Kentucky Administrative Regulation (KAR), Title 401 Energy and Environmental Cabinet, Department for Environmental Protection, Chapter 45 Special Waste Section, Section 160, Surface and Groundwater Monitoring and Corrective Action for Special Waste Sites or Facilities (401 KAR 45:160).

Kentucky Administrative Regulation (KAR), Title 401 Energy and Environmental Cabinet, Department for Environmental Protection, Chapter 6 Water Wells, Section 350, Monitoring Well Construction Practices and Standards (401 KAR 6:350).

FIGURES



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STATE OF KENTUCKY
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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

EQUALITY QUADRANGLE
(https://viewer.nationalmap.gov/basic/)

0 2,500 5,000 Feet

N

Big Rivers ELECTRIC CORPORATION

Wilson Station
Ohio County, Kentucky

FIGURE 1
SITE LOCATION MAP

DATE: 5/4/2021	SCALE: 1IN = 5,000 FEET
CREATED BY: BMcD	
JOB NO. 130891	

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MW-1
MW-8
MW-5
P9
MW-2
MW-102
MW-6
MW-111
P11
MW-7
MW-3
MW-112
MW-10
MW-10D
MW-4
MW-4D
MW-110
MW-105
MW-105 R
MW-113
MW-104
MW-114

FSA, USDA, NAIP, DGI

Legend

- Property Boundary
- CCR Phase 2 Fill
- Bond Increment
- KAR Permit Area
- Downgradient CCR Monitoring Well Location
- Upgradient CCR Monitoring Well Location
- Characterization Monitoring Well Location
- Piezometer Location (Water Level Only)
- Abandonded Monitoring Well Location
- New Characterization Monitoring Well Location

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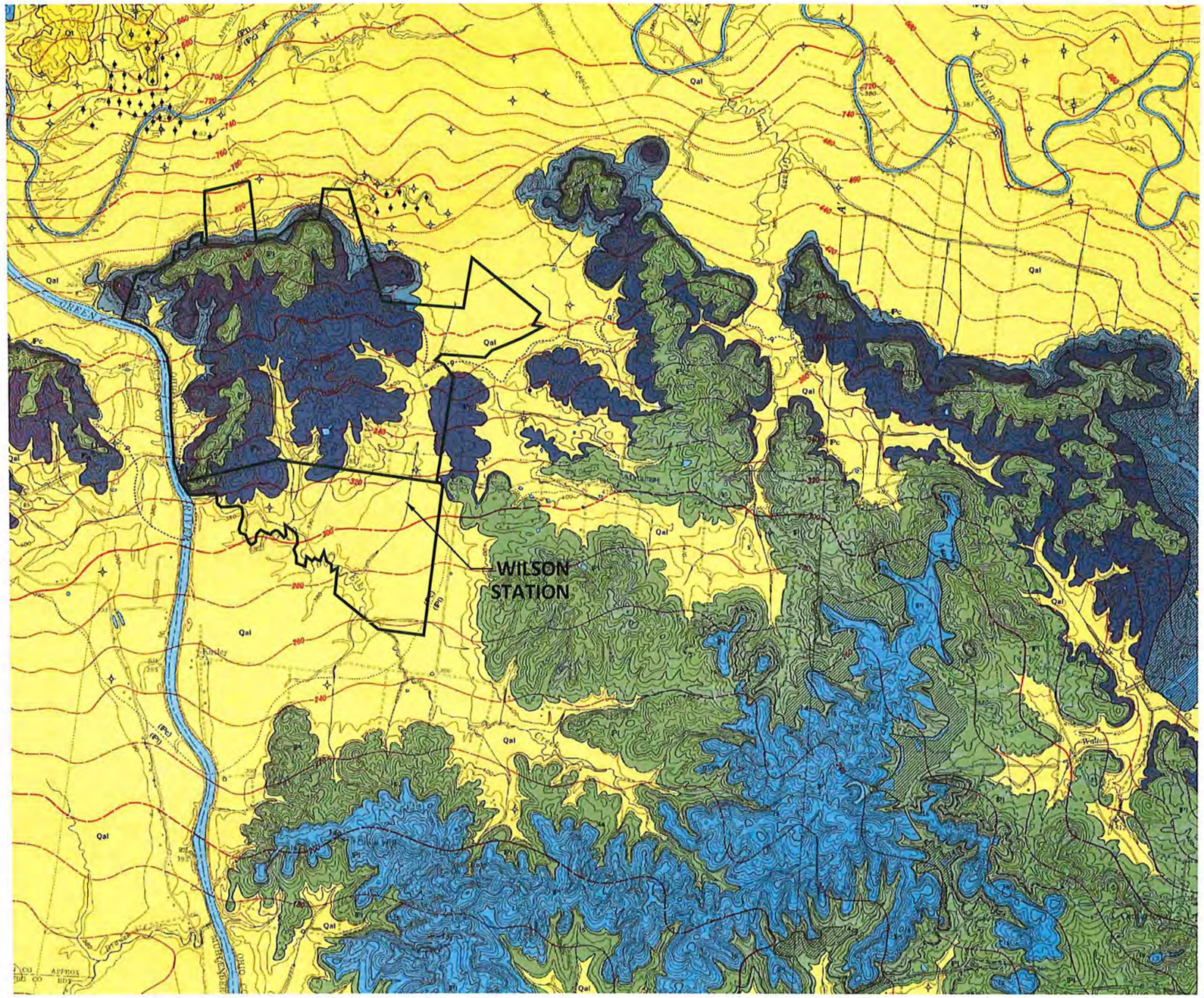
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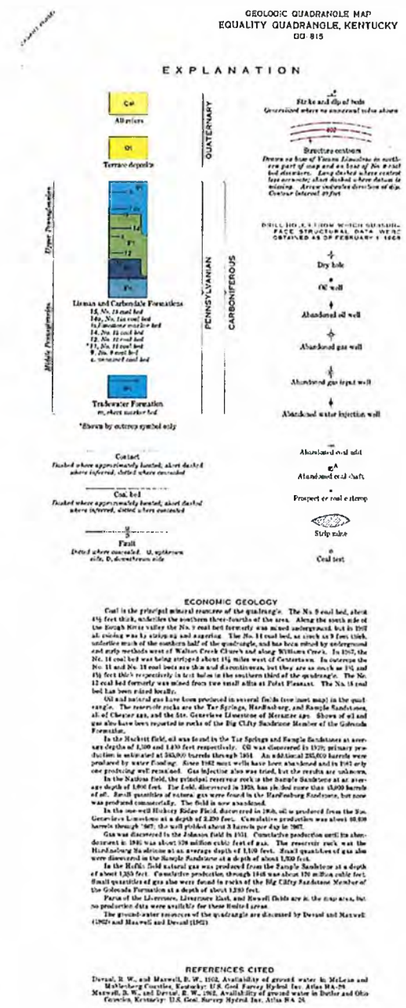
Big Rivers ELECTRIC CORPORATION

Wilson Station Landfill
Ohio County, Kentucky

FIGURE 2
MONITORING WELL AND
PIEZOMETER LOCATION MAP

DATE: 2/15/2022	SCALE: 1IN = 750 FEET
CREATED BY: BMcD	
JOB NO. 139018	





GEOLOGIC QUADRANGLE MAP
EQUALITY QUADRANGLE, KENTUCKY
GQ-815

EXPLANATION

Qal — Alluvium

Ot — Terrace deposits

QUATERNARY

PENNSYLVANIAN

CARBONIFEROUS

Lisman and Carbondale Formations
14, No. 13 coal bed
14a, No. 12a coal bed
14-No. 12 coal bed
12, No. 11 coal bed
*11, No. 10 coal bed
9, No. 9 coal bed
c, unnamed coal bed

Tradewater Formation
m, where number bed

*Shown by outcrop symbol only

Contact
Dashed where approximately located, short dashed where inferred, dotted where concealed

Coal bed
Dashed where approximately located, short dashed where inferred, dotted where concealed

Fault
Dotted where concealed. U, upthrown side; D, downthrown side

Strike and dip of beds
Generalized where too crowded to be shown

Structure contours
Drawn on base of Vienna Limestone in northern part of map and on base of No. 9 coal bed elsewhere. Long dashed where control less accurate; short dashed where datum is missing. Arrow indicates direction of dip. Contour interval 20 feet

DRILLING LOCATIONS FOR WHICH SUBSURFACE STRUCTURAL DATA ARE OBTAINED AS OF FEBRUARY 1, 1965

Dry hole

Oil well

Abandoned oil well

Abandoned gas well

Abandoned gas input well

Abandoned water injection well

Abandoned coal mine

Abandoned coal shaft

Prospect or coal outcrop

Strip mine

Coal test

ECONOMIC GEOLOGY

Coal is the principal mineral resource of the quadrangle. The No. 9 coal bed, about 4½ feet thick, underlies the southern three-fourths of the area. Along the south side of the Green River valley the No. 9 coal bed formerly was mined underground, but its original extent was by stripping and augering. The No. 11 coal bed, as much as 5 feet thick, underlies much of the northern half of the quadrangle, and has been mined by underground and strip methods west of Walton Creek Church and along Williams Chute. In 1957, the No. 11 coal bed was being stripped about 1½ miles west of Centertown. In outcrops the No. 11 and No. 10 coal beds are 18 in and discontinuous, but they are as much as 3½ and 4½ feet thick respectively in test holes in the southern third of the quadrangle. The No. 12 coal bed formerly was mined from two small adits at Pilot Pleasant. The No. 14 coal bed has been mined locally.

Oil and natural gas have been produced in several fields (see inset map) in the quadrangle. The reservoir rocks are the Tar Springs, Hardinsburg, and Sample Sandstones, all of Chester age, and the Ste. Genevieve Limestone of Meramec age. Shows of oil and gas also have been reported in rocks of the Big Clifty Sandstone Member of the Golconda Formation.

In the Hackett field, oil was found in the Tar Springs and Sample Sandstones at average depths of 1,100 and 1,450 feet respectively. Oil was discovered in 1939; primary production is estimated at 340,000 barrels through 1954. An additional 295,000 barrels were produced by water flooding. Some 1942 wells have been abandoned and in 1961 only one producing well remained. Gas injection also was tried, but the results are unknown.

In the Station field, the principal reservoir rock is the Sample Sandstone at an average depth of 1,000 feet. The Lisbon, discovered in 1938, has yielded more than 15,000 barrels of oil. Small quantities of natural gas were found in the Hardinsburg Sandstone, but none was produced commercially. The field is now abandoned.

In the one well (Hickory Ridge Field) discovered in 1946, oil is produced from the Ste. Genevieve Limestone at a depth of 2,200 feet. Cumulative production was about 10,000 barrels through 1967; the well yielded about 3 barrels per day in 1967.

Gas was discovered in the Johnson field in 1931. Cumulative production until its abandonment in 1946 was about 170 million cubic feet of gas. The reservoir rock was the Hardinsburg Sandstone at an average depth of 1,350 feet. Small quantities of gas also were discovered in the Sample Sandstone at a depth of about 1,350 feet.

In the Huffs field natural gas was produced from the Sample Sandstone at a depth of about 1,200 feet. Cumulative production through 1948 was about 170 million cubic feet. Small quantities of gas also were found in rocks of the Big Clifty Sandstone Member of the Golconda Formation at a depth of about 1,250 feet.

Parts of the Lil-ermore, Limestone Knob, and Howell fields are in the map area, but no production data were available for these fields' areas.

The ground-water resources of the quadrangle are discussed by Durrett and Maxwell (1962) and Maxwell and Durrett (1962).

REFERENCES CITED

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Maxwell, B. W., and Durrett, R. W., 1962, Availability of ground water in Butler and Ohio Counties, Kentucky: U.S. Geol. Survey Hydrol. Inv. Atlas HA-58

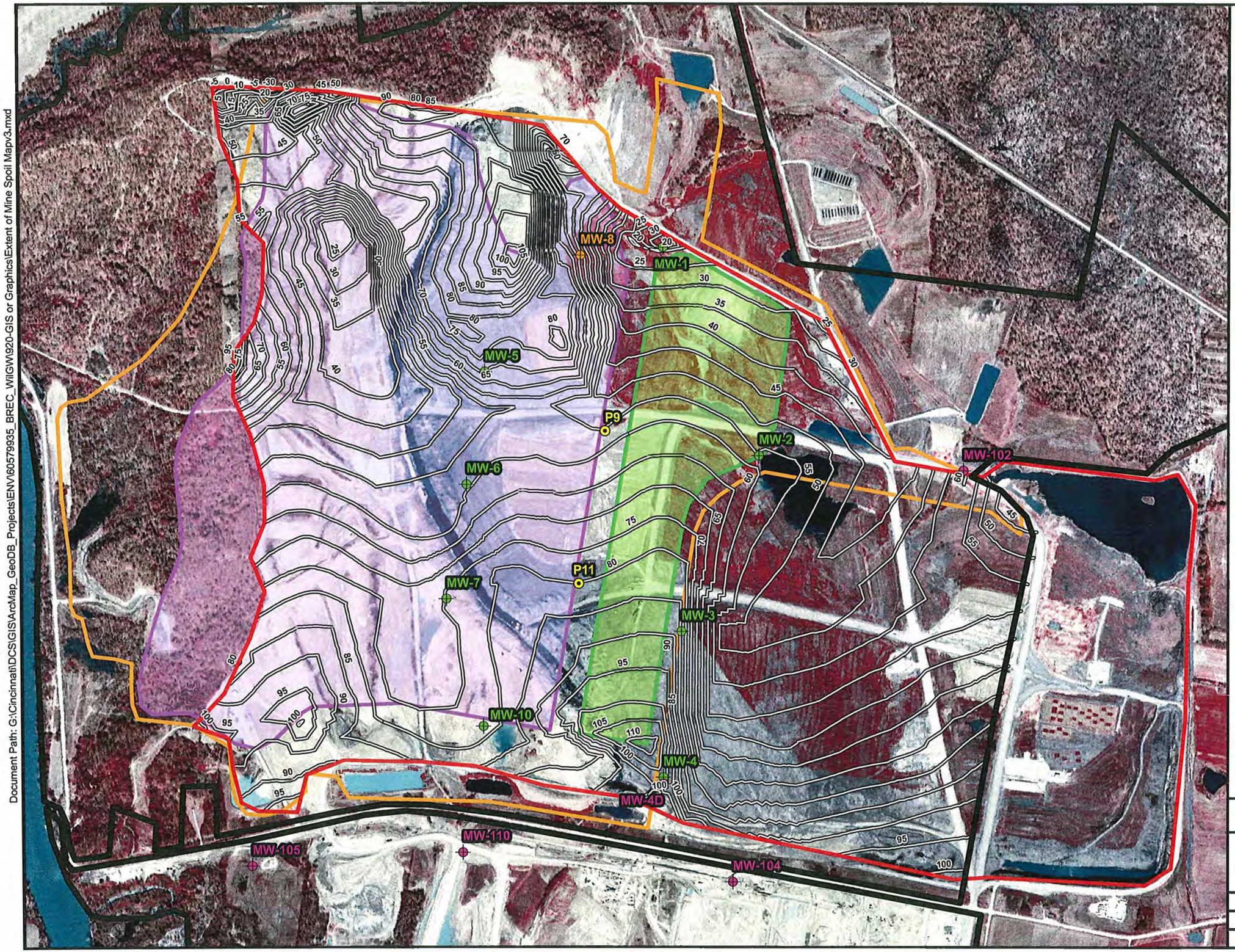
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Big Rivers ELECTRIC CORPORATION

Wilson Station
Ohio County, Kentucky

FIGURE 3
SITE GEOLOGIC MAP
(KENTUCKY GEOLOGICAL SURVEY)

DATE: 03/17/2021	SCALE: AS SHOWN
CREATED BY: BMcD	
JOB NO. 130891	



Legend

- Property Boundary
- KAR Permit
- Phase 1 Fill
- CCR Phase 2 Fill
- Interpreted Extent of Mine
- Thickness of Mine Spoils (5')
- Characterization Monitoring Well Location
- Downgradient Monitoring Well Location
- Upgradient Monitoring Well Location
- Piezometer Location (Water Level Only)

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Feet

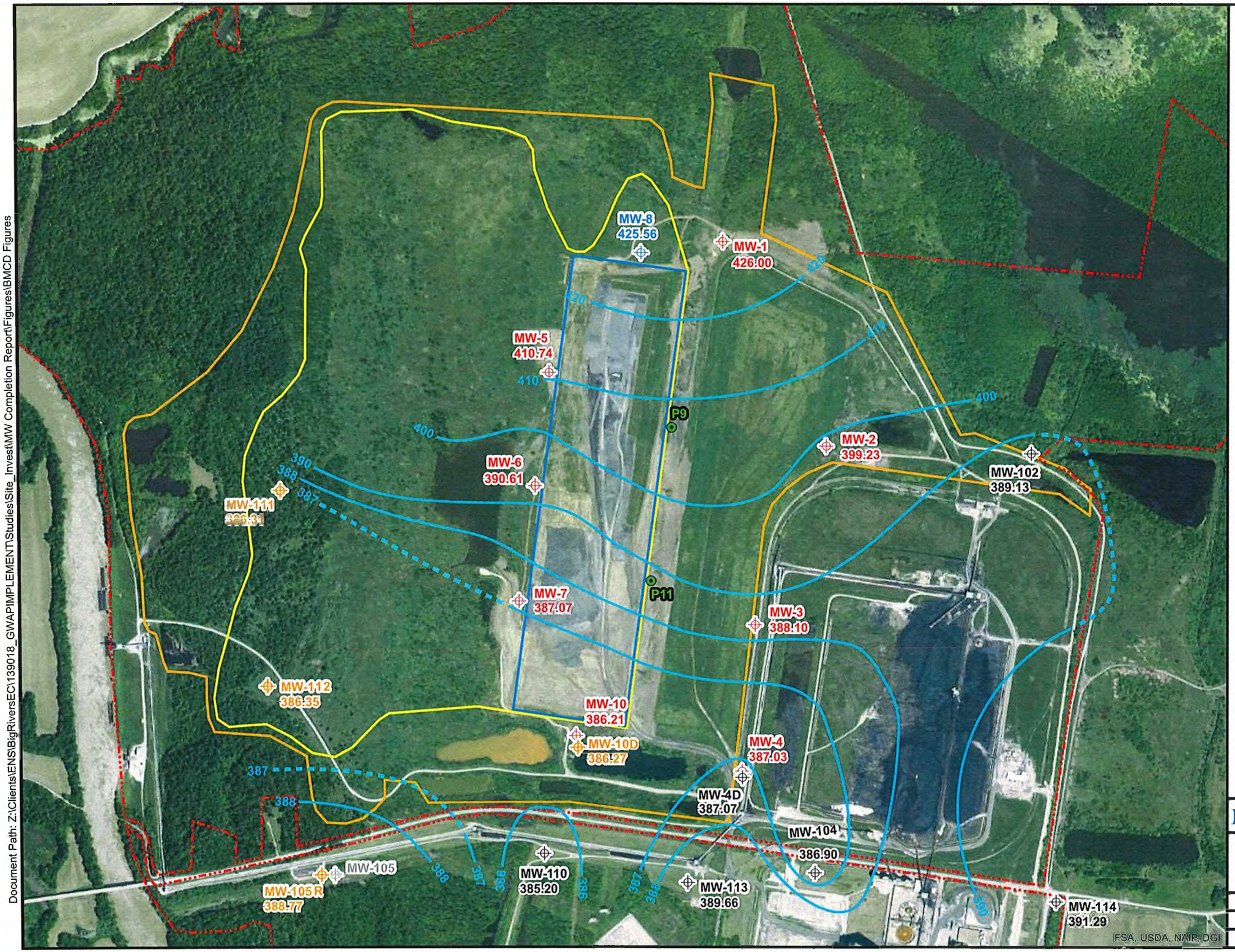
Base Map Source: USGS aerial imagery, 1981, Scale 1:58,000

Wilson Station Landfill
Ohio County, Kentucky

FIGURE 4
MINE SPOIL ISOPACH MAP

DATE: 3/17/2021	SCALE: 1IN = 800 FEET
CREATED BY: BMcD	
JOB NO. 130891	

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Legend

- Property Boundary
- CCR Phase 2 Fill
- Bond Increment
- KAR Permit Area
- Downgradient CCR Monitoring Well Location
- Upgradient CCR Monitoring Well Location
- Characterization Monitoring Well Location
- Piezometer Location (Water Level Only)
- Abandonded Monitoring Well Location
- New Characterization Monitoring Well Location
- Water Table Contour (Dashed where inferred)
- Groundwater Flow Direction
- 409.69 Groundwater Elevation (Feet, NAD27) Measured January 12-13, 2022

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N

0 750 1,500
Feet

BigRivers ELECTRIC CORPORATION

Wilson Station Landfill
Ohio County, Kentucky

FIGURE 5
GROUNDWATER SURFACE MAP
JANUARY 2022

DATE: 2/25/2022	SCALE: 1IN = 750 FEET
CREATED BY: BMcD	
JOB NO. 139018	

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TABLES

Table 1
Summary of Monitoring System Well Construction Details
Special Waste Landfill
Big Rivers Electric Corporation - Wilson Station
Centertown, Kentucky

Well No.		Location* Lat	Long	Reference Elevation* TOIC (feet, NAD27)	GS (feet, NAD27)	Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval (feet, NAD27) Top	Bottom	Screened Interval (feet, NAD27) Top	Bottom	Bottom of Boring (feet, GS)
Phase I Landfill Monitoring Wells												
MW-1 (8002-9621)	U	37.4667	-87.0852	443.89	442.31	36.3	4 inch / PVC	419.6	407.6	417.6	407.6	36
MW-2 (8002-9622)	D	37.4618	-87.0820	417.11	414.60	36.0	4 inch / PVC	393.3	381.1	391.1	381.1	36
MW-3 (8002-9623)	D	37.4576	-87.0845	411.12	408.19	36.2	4 inch / PVC	387.2	374.9	384.9	374.9	36
MW-4 (8002-9624)	D	37.4546	-87.0850	408.82	406.55	31.3	4 inch / PVC	389.6	377.5	387.5	377.5	31
Phase II Landfill Monitoring Wells												
MW-5 (8005-3477)	D	37.4638	-87.0910	469.14	467.42	75.0	2 inch / PVC	404.92	391.42	402.92	392.92	76
MW-6 (8005-3476)	D	37.4614	-87.0910	433.06	431.12	53.5	2 inch / PVC	390.42	377.12	388.12	378.12	54
MW-7 (8005-3479)	D	37.4584	-87.0913	426.14	424.08	50.0	2 inch / PVC	386.58	373.18	384.58	374.58	50.9
MW-8 (8005-3475)	U / B	37.4682	-87.0883	471.60	470.01	63.5	2 inch / PVC	419.53	405.96	417.05	407.05	64.05
MW-10 (8005-3478)	D	37.4544	-87.0902	398.91	396.91	22.4	2 inch / PVC	387.16	373.83	384.99	374.99	23.08
Characterization Wells (Screening Use Only)												
MW-4D (8007-4811)	D / C	37.4542	-87.0851	410.02	407.03	96.4	2 inch / PVC	326.03	313.03	324.03	314.03	111
MW-102 (8007-2995)	D / C	37.4613	-87.0757	399.71	396.46	39.3	2 inch / PVC	372.46	360.46	370.46	360.46	36
MW-104 (8007-2994)	D / C	37.4517	-87.0826	392.87	389.76	43.4	2 inch / PVC	361.76	349.26	359.76	349.76	40
MW-105 (8007-2992)*	D / C	37.4516	-87.0973	396.74	393.56	63.3	2 inch / PVC	366.56	333.56	343.56	333.56	60
MW-105R (8007-1175)	U / C	37.4516	-87.0972	397.13	394.11	38.7	2 inch / PVC	371.11	357.94	368.67	358.67	35.33
MW-110 (8007-2996)	D / C	37.4521	-87.0907	393.54	390.56	42.8	2 inch / PVC	362.56	350.56	360.56	350.56	76 / 40
MW-111 (8007-8615)	D / C	37.4593	-87.0982	466.06	463.58	98.5	2 inch / PVC	379.81	367.08	377.81	367.81	105
MW-112 (8007-8614)	D / C	37.4559	-87.0990	403.82	401.15	54.7	2 inch / PVC	361.38	348.65	359.38	349.38	56
MW-113 (8007-1174)	U / C	37.4514	-87.0862	411.61	408.66	58.0	2 inch / PVC	365.89	349.99	363.89	353.89	94
MW-114 (8007-8613)	U / C	37.4510	-87.0760	404.18	401.46	50.7	2 inch / PVC	365.69	351.46	363.69	353.69	56
MW-10D (8007-8616)	D / C	37.4548	-87.0899	399.00	396.27	77.7	2 inch / PVC	333.50	320.77	331.50	321.50	77
Water Levels Only												
P-9 (8005-3480)	water level only	37.4622	-87.0867	432.37	429.19	38.7	2 inch / PVC	402.99	389.99	400.99	390.99	39.2
P-11 (8005-3472)	water level only	37.4593	-87.0872	446.55	444.03	68.6	2 inch / PVC	388.43	374.90	385.93	375.93	69.13

Notes:

* MW-105R abandoned and replaced by MW-105

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015, November 2018, and January 2022.

Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum

PVC = Polyvinyl chloride

ID = Internal Diameter

TOIC = Top of internal casing, or measured from (below) TOIC

GS = Ground Surface, or measured from (below) GS

U / B = Upgradient / Background

D = Downgradient

C = Characterization

Table 2
Summary of Groundwater Depths and Elevations - January 2022
Special Waste Landfill
Big Rivers Electric Corporation - Wilson Station
Centertown, Kentucky

BREC Wilson Station Water Levels						
			1/12/2022		1/13/2022	
Well ID	GS Elev. (ft amsl)	TOC Elev. (ft amsl)	DTW (ft bTOC)	GW Elev. (ft amsl)	DTW (ft bTOC)	GW Elev. (ft amsl)
MW-105R	394.11	397.13	n/a	0.00	8.36	388.77
MW-10D	396.27	399.00	12.73	386.27	NM	na
MW-111	463.58	466.06	79.75	386.31	NM	na
MW-112	401.15	403.82	17.47	386.35	NM	na
MW-10	396.91	398.91	12.70	386.21	NM	na
MW-113	408.66	411.61	n/a	0.00	21.95	389.66
MW-114	401.46	404.18	n/a	0.00	12.89	391.29
MW-110	390.56	393.54	n/a	0.00	8.34	385.20
MW-104	389.76	392.87	n/a	0.00	5.97	386.90
MW-7	424.08	426.14	n/a	0.00	39.07	387.07
MW-6	431.12	433.06	n/a	0.00	42.45	390.61
MW-5	467.42	469.14	n/a	0.00	58.40	410.74
MW-8	470.01	471.60	n/a	0.00	46.04	425.56
MW-1	442.31	443.89	n/a	0.00	17.89	426.00
MW-2	414.60	417.11	n/a	0.00	17.88	399.23
MW-3	408.19	411.12	n/a	0.00	23.02	388.10
MW-4	406.55	408.82	n/a	0.00	21.79	387.03
MW-4D	407.03	410.02	n/a	0.00	22.95	387.07
MW-102	396.46	399.71	n/a	0.00	10.58	389.13

Notes:
amsl = above mean sea level
bTOC = below top of casing
DTW = depth to water
Elev. = elevation
ft = feet
GS. = ground surface
GW = groundwater

Table 3
Estimated Vertical Hydraulic Gradients
Special Waste Landfill
Big Rivers Electric Corporation - Wilson Station
Centertown, Kentucky

Well Cluster	Total Well Depth (feet bTOC)	Well Screen Elevation Top (ft amsl)	Well Screen Elevation Bottom (ft amsl)	Screened Geologic Formation	January 2022 Water Depth (ft bTOC)	January 2022 Water Elevation (ft amsl)	January 2022 Difference in Water Level (ft)	January 2022 Vertical Gradient (feet/foot)	
MW-4	31.30	387.50	377.50	Mine spoils	21.79	387.03	0.04	-0.00063	Upward
MW-4D	96.40	324.03	314.03	Mine spoils	22.95	387.07			
MW-10	22.4	384.99	374.99	Mine spoils	12.70	386.21	0.06	-0.0011	Upward
MW-10D	76.95	331.50	321.50	Mine spoils	12.73	386.27			

$$\text{Vertical Gradient (ft/ft)} = \frac{\text{(Groundwater Elevation of Shallow Well - Groundwater Elevation of Deep Well)}}{\text{(Bottom Elevation of Shallow Well Screen - Bottom Elevation of Deep Well Screen)}}$$

amsl - above mean sea level (North American Vertical Datum 1988 (NAVD88)
bTOC - below top of casing
ft - feet

Notes:

1. Positive vertical gradient value identifies a downward gradient, while a negative value identifies an upward gradient.

APPENDIX A – KDWM GWAP APPROVAL LETTER AND REVISED PERMIT

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

TONY HATTON
COMMISSIONER

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601
TELEPHONE: 502-564-2150
TELEFAX: 502-564-4245

August 4, 2021

Mr. Tracy Cole
Big Rivers Electric Corporation
5663 State Route 85 West
Centertown, Kentucky 42328

Sent via E-mail only

RE: Conditional Approval of Groundwater Assessment Plan
Big Rivers Electric Corporation – D.B. Wilson Station Special Waste Landfill
Agency Interest No. 3319
Application I.D. No. AIN20140001
Ohio County

Dear Mr. Cole,

The Kentucky Division of Waste Management (DWM), Solid Waste Branch has completed the review of the Groundwater Assessment Plan for the facility, referenced above, received July 28, 2014, with additional subsequent responses to DWM comments. The Groundwater Assessment Plan is hereby conditionally approved with the provisions listed on the permit.

Please find enclosed a revised permit. To receive an electronic copy of the approved application, please utilize the Kentucky Department of Environmental Protection's eSearch tool via https://dep.gateway.ky.gov/eSearch/Search_License.aspx on or around August 17, 2021.

Be advised that if you consider yourself aggrieved by the issuance of this permit, you have the right, pursuant to KRS 224.10-420(2) to file a petition demanding a hearing with the Cabinet. This right shall be limited to a period of thirty (30) days. The petition should be filed with The Office of Administrative Hearings located at 211 Sower Blvd., Frankfort, KY 40601. See https://eec.ky.gov/About/Administrative-Hearings/Pages/default.aspx for additional information.

If you need any additional information, please contact Todd Hendricks, P.G. at (502) 782-6380 or todd.hendricks@ky.gov.

Sincerely,

Signed by: Danny Anderson

Danny Anderson, P.E.
Manager, Solid Waste Branch

DA/km/ta/lkg/sa

c: Mr. Tracy Cole via e-mail: Tracy.Cole@bigrivers.com
Mr. Nathan Berry via e-mail Nathan.Berry@bigrivers.com
Mr. Mike Galbraith via e-mail Michael.Galbraith@bigrivers.com

Kentucky Energy and Environment Cabinet
Department for Environmental Protection
Division of Waste Management

PERMIT

Facility: **Big Rivers Electric Corp - DB Wilson Station Landfill**
5663 KY 85 W
Centertown, KY 42348

Permittee: **Big Rivers Electric Corporation**
5663 KY 85 W
Centertown, KY 42328

Agency Interest: **Big Rivers Electric Corp - Wilson Station**
5663 KY 85 W
Centertown, KY 42348

The Division has issued the permit under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. This permitted activity or activities are subject to all conditions and operating limitations contained herein. Issuance of this permit does not relieve the permittee from the responsibility of obtaining any other permits, licenses or approvals required by this Division or other state and local agencies.

No deviation from the plans and specifications submitted with your application or any condition specified herein is allowed, unless authorized in writing from the Division. Violation of the terms and conditions specified herein may render this permit null and void. All rights of inspection by representatives of the Division are reserved. Conformance with all applicable Waste Management Regulations is the responsibility of the permittee.

Agency Interest ID #: **3319**

Solid Waste Permit #: **SW09200004**

County: **Ohio**

Permitted Activities:

Subject Item	Activity	Type	Status
ACTV005	Special Waste Landfill-Coal/09200004	Construction/Operation	Active
ACTV009	CCR Unit - Landfill/09200004	Construction/Operation	Active

PERMIT

Acreage Summary:

Waste Disposal Area (in Acres):

Activity	Disposal Area
CCR Unit - Landfill	91.83
Special Waste Landfill-Coal	82.47
Total Disposal Area	174.30
Total Permitted Area	700.00

Cost Estimate Summary:

Coverage Type	Cost Estimate	Effective	Comments
*See Page 3 for additional information			

Financial Assurance Summary:

The owner or operator shall maintain the following financial assurance approved by the Division in compliance with KRS Chapter 224.40-650, KRS Chapter 224.50-862, 401 KAR 45:080, and 401 KAR 48:310:

Instrument Type	Instrument Number	Amount	Date Received	Comments
Letter of Credit	KY062-H-5102-002	$2,504,400.00	07/15/2009	See Page 3 for additional information

First Operational Permit Effective Date: 11/27/1984 -- Inert Landfill

Permit Effective Date: 07/01/1992

Permit Expiration Date: Life of Facility

Permit issued: 08/04/2021

Sincerely,

Danny Anderson, P.E.
Manager, Solid Waste Branch

Permit Conditions:

Facility Information and/or Conditions

1. An updated cost estimate incorporating the technical standards of 401 KAR Chapter 46 was submitted to the Solid Waste Branch (SWB) on June 3, 2021 as part of a proposed modified closure plan, referenced as APE20200002. The owner or operator shall submit the increase in financial assurance, in accordance with 401 KAR 45:080 and the updated estimate, no later than **September 8, 2021**.

Subject Items

ACTV0005 - Special Waste Landfill-Coal

Standard Requirements:

1. General: The owner or operator of a special waste facility shall comply with KRS Chapter 224 and 401 KAR Chapters 30, 40 and 45 for the construction and operation of special waste facilities. [KRS 224.50-760]

2. General: For construction and operation of the special waste landfill, the owner or operator shall comply with KRS Chapter 224.50-760, 401 KAR 45:030, 45:110 and the approved permit application(s). [401 KAR 45:110]

Variances, Alternate Specifications and Special Conditions:

1. Financial Assurance: The maximum extent of operation includes the area of the landfill identified by an operating permit and for which the final cover Construction Progress Report has not yet been approved by the cabinet. The current maximum extent of operation for this Special Waste Landfill is 91.8 acres. [401 KAR 45:080]

2. General: The Special Waste Landfill previously operated as a single permitted activity recorded as ACTV0005. On August 4, 2021, the permit issued reflected the updates in accordance with the 401 KAR Chapter 46 technical standards. The Special Waste Landfill permitted activity was split into two separate permitted activities: the Phase I Special Waste Landfill and the Phase II CCR Landfill. The Phase I Special Waste Landfill footprint consists of approximately 94.29 acres, which includes disposal area and portions of extended cover and run-off ditches. The Phase I Special Waste Landfill continues to be recorded as a Special Waste Landfill (ACTV005). The Phase II CCR Landfill was split from and converted from a Special Waste Landfill (ACTV005) to a CCR Unit - Landfill (ACTV009) on August 4, 2021. [401 KAR 45:140 Section 2]

3. Wastestreams: The permittee may accept special waste streams as described in the approved plans and applications from the D. B. Wilson Station, Ohio Co., Island, Kentucky. If waste is accepted in the Phase I Special Waste Landfill, the owner or operator shall notify the Solid Waste Branch in writing within forty-eight (48) hours. [401 KAR 45:110 Section 3(7), 401 KAR 45:140 Section 2]

4. Closure: Upon cessation of special waste disposal activities at the landfill, the owner or operator shall implement the approved closure plan in accordance with its terms and the requirements of this chapter. An owner or operator may be required to revise a closure plan prior to implementation. [401 KAR 45:110 Section 5]

5. Wastestreams: The permittee may accept fly ash and bottom ash from the Kenneth Coleman Station, Hancock Co., Hawesville, KY. If waste is accepted in the Phase I Special Waste Landfill, the owner or operator shall

notify the Solid Waste Branch in writing within forty-eight (48) hours. [401 KAR 45:110 Section 3(7), 401 KAR 45:140 Section 2]

6. Closure: A special waste landfill shall be closed in a manner that complies with 401 KAR 30:031. The owner or operator of a special waste landfill shall submit a closure plan that includes a closure design as specified in subsection (2) of 401 KAR 45:110, Section 5, a closure cost estimate in accordance with Section 2 of 401 KAR 45:080, a narrative discussing the closure plan's conformance with 401 KAR 30:031, and a schedule for implementation of the plan. [401 KAR 45:110 Section 5]

7. General: The owner or operator may only accept waste at the special waste landfill from the sources which are approved per 401 KAR 45:020, Section 2(1)(a), 45:030, Section 8(1)(a), and 45:110. If waste is accepted in the Phase I Special Waste Landfill, the owner or operator shall notify the Solid Waste Branch in writing within forty-eight (48) hours. [401 KAR 45:110, 401 KAR 45:140 Section 2]

County Sources - The owner or operator may accept waste as authorized by the cabinet pursuant to KRS 224 and/or 401 KAR Chapter 47 from the following counties:

Kentucky: Hancock, Ohio

Approved Applications - The owner or operator shall comply with applicable statutes and regulations and the following approved applications:

1. 10-01-1979 - As-Built Plans Approved
2. 04-16-1981 - As-Built Plans Approved
3. 09-06-1984 - First Construction Permit Issued
4. 10-10-1984 - As-Built Plans Approved
5. 11-27-1984 - First Operation Permit Issued (Inert Landfill) - Effective on 11-27-1984
6. 12-07-1987 - As-Built Plans Approved
7. 10-28-1988 - As-Built Plans Approved
8. 09-12-1990 - Permit Renewal - APE19890001
9. 03-10-1994 - Major Modification - LI1MOVX1 - Vertical Expansion Approval & Continuation to Operate - APE19920001
10. 01-30-1996 - Groundwater Monitoring Plan - APE19900001
11. 02-28-1996 - Minor Modification #1 - LI1MOMN1 - APE19900002
12. 02-28-1996 - Permit Renewal #2 - LI1PR2 - APE19930001
13. 03-22-1999 - Permit Transfer - LS1PT1 - Transfer Big Rivers Electric Corp to Western Kentucky Energy Corp - APE19980001
14. 11-17-2004 - Add Waste Source - LS1MOAD1 - Fly Ash and Bottom Ash from Kenneth Coleman Plant – APE20010001
15. 12-20-2004 - Special Waste Beneficial Reuse - Poz-O-Tec - ARP20040001
16. 02-25-2008 - Groundwater Assessment Report - AIN20050002
17. 03-14-2005 - Minor Modification - Vertical Expansion - APE20040001
18. 05-05-2005 - Groundwater Assessment Plan - AIN20040001
19. 02-26-2009 - Groundwater Monitoring Plan - APE20080002
20. 10-08-2009 - Monitoring Well CPR & Authorization for Waste Placement in Bond Increment Area 2 – APE20090004
21. 05-19-2010 - Permit Transfer - From Western Kentucky Energy to Big Rivers Electric Corporation – APE20090002
22. 11-30-2017 - Amendment to Groundwater Monitoring Plan - APE20170001

23. 08-04-2021 - See the CCR Unit-Landfill activity (ACTV0009) for additional information
24. 08-04-2021 - Groundwater Assessment Plan - AIN20140001

ACTV0009 - CCR Unit - Landfill

Variances, Alternate Specifications and Special Conditions:

1. General: The Special Waste Landfill previously operated as a single permitted activity recorded as ACTV0005. On August 4, 2021, the permit issued reflected the updates in accordance with the 401 KAR Chapter 46 technical standards. The Special Waste Landfill permitted activity was split into two separate permitted activities: the Phase I Special Waste Landfill and the Phase II CCR Landfill. The Phase II CCR Landfill consists of approximately 91.83 acres. The Phase II CCR Landfill was split from and converted from a Special Waste Landfill (ACTV005) to a CCR Unit - Landfill (ACTV009) on August 4, 2021. Additional information pertaining to this conversion can be found in permitting actions AIN20140001 and APE20200002. The Phase II CCR Landfill is a CCR Unit as defined by 401 KAR 46:101 and is subject to the standards pursuant to 401 KAR 46:110, and the Phase II CCR Landfill remains subject to the procedural requirements in 401 KAR Chapter 45. [401 KAR 45:020, 401 KAR 45:025, 401 KAR 45:030, 401 KAR 45:040, 401 KAR 45:050, 401 KAR 45:080, 401 KAR 45:140, 401 KAR 46:110]

2. General: The owner or operator of a Coal Combustion Residuals (CCR) Unit shall comply with KRS Chapter 224 and 401 KAR Chapter 46 for the construction, operation, maintenance, and closure of a CCR Unit and other provisions pursuant to 401 KAR Chapters 30, 40, and 45 as applicable. The owner or operator shall comply with the applicable provisions in the Approved Applications listed on this permit document for ACTV0005 - Special Waste Landfill-Coal and with all provisions in the Approved Applications listed on this permit document for ACTV0009 - CCR Unit - Landfill. [401 KAR 45:030, 401 KAR 45:140]

3. General: The owner or operator shall submit the $15,000 annual fee no later than July 31 of each year pursuant to 401 KAR 46:120. Applications and reports specific to only the Phase II CCR Landfill, or only other CCR Units, for this facility shall not be subject to the filing fees pursuant to 401 KAR 45:250. [401 KAR 46:120 Section 4]

Approved Applications - The owner or operator shall comply with applicable statutes and regulations and the following approved applications:

1. 08-04-2021 - See the Special Waste Landfill-Coal activity (ACTV0005) for additional information and site history
2. 08-04-2021 - Permit Issued in accordance with 401 KAR Chapter 46 technical standards - AIN20140001

Financial Assurance

ACTV0001 - Financial Assurance

The following is a history of the financial assurance for this facility:

1. 1 0-07-1984 - SB #B5703-16, $879,600.00
2. 07-14-1994 - SB #CSB0162808, $879,600.00
3. 07-14-1994 - SB #B5703-16 released
4. 07-08-1998 - LOC #SLCDC3896/912678, $879,600.00 rejected

5. 11-16-1998 - LOC #SLCDC3896/912767, $879,600.00 rejected
6. 01-15-1999 - LOC #SLCDC3896/912851, $879,600.00
7. 01-15-1999 - SB #CSB0162808 released
8. 02-26-2004 - LOC #033250100, $951,263.00
9. 02-26-2004 - LOC #SLCDC3896/912851 released
10. 08-19-2004 - LOC #033250100 increased to $966,483.00
11. 06-30-2004 - LOC #033250100 increased to $986,779.00
12. 05-10-2006 - LOC #033250100 increased to $1,008,779.00
13. 07-24-2007 - LOC #033250100 increased to $1,039,735.00
14. 07-15-2009 - LOC #KY06-2-H-5102-002, $2,504,400.00
15. 07-31-2009 - LOC #033250100 released.

Monitoring Conditions

GSTR0001 - Groundwater Monitoring - SWB: (Phase I monitoring wells)

Group Members: STRC0001 - Well MW-1; STRC0002 - Well MW-2; STRC0003 - Well MW-3; STRC0004 - Well MW-4

Standard Requirements:

1. The owner or operator shall satisfy the requirements of 401 KAR 45:160 for all wastes and waste constituents contained in the site or facility. [401 KAR 45:160 Section 1]

2. The permittee shall monitor for other parameters as required by the cabinet. [401 KAR 45:160 Section 8(2)(c)]

3. The owner or operator shall monitor groundwater on the approved schedule at each approved groundwater monitoring location in accordance with 401 KAR 45:160, the permit, and the approved plans. A table summarizing the parameters to be monitored, their respective limits and monitoring frequency is included herein. [401 KAR 45:160, 401 KAR 45:140 Section 1(1)]

4. The owner or operator shall conduct statistical analysis of the groundwater data in accordance with 401 KAR 45:160 Section 6 and the approved applications. The statistical test chosen shall be conducted separately for each parameter in each well for each monitoring event. The results shall be maintained as part of the facility record throughout the operating and postclosure life of the facility. [401 KAR 45:160 Section 6, 401 KAR 45:140 Section 1(1)]

5. The groundwater analytical data and statistical analysis shall be submitted on forms provided by the cabinet, within sixty (60) days after sampling or 15 days of the completion of statistical analysis, whichever is sooner. [401 KAR 45:160 Section 4]

6. If the analysis of groundwater sample results indicates contamination (i.e., a statistical or MCL exceedence) as specified in 401 KAR 45:160 Section 5, the owner or operator shall notify the cabinet within (forty-eight) 48 hours of receiving the results and shall arrange to split samples no later than ten (10) days from the receipt of the results. [401 KAR 45:160 Section 5]

7. The owner or operator shall be required to prepare and submit a groundwater contamination assessment plan if laboratory analyses of one (1) or more public or private water supplies or monitoring wells at the site shows the presence of one (1) or more parameters above the maximum contaminant level (MCL) as specified in 401 KAR 30:031 or a statistically significant increase over background levels for parameters that have no MCL. [401 KAR 45:160 Section 5]

8. The owner or operator shall provide alternate water supplies to all affected parties within twenty-four (24) hours of notification of the cabinet that sample results indicate contamination of a drinking water supply if it has been determined that the special waste site or facility is the probable source of the contamination. [401 KAR 45:160 Section 3]

9. If required by the cabinet, groundwater contamination assessment and corrective action shall be performed in full compliance with all provisions of 401 KAR 45:160 Section 5. [401 KAR 45:160 Section 5]

Variances, Alternate Specifications and Special Conditions:

1. Monitoring Well Purging: Monitoring wells shall be purged using low-flow sampling equipment, at flow rates between 100 and 500 milliliters per minute. Drawdown during purging shall not exceed 0.5 feet. Purge water shall be passed through a calibrated flow cell until three consecutive readings taken at three- to five-minute intervals show that: a) pH varies no more than plus or minus 0.1 Standard Units; b) conductivity varies no more than plus or minus 3%; c) temperature varies no more than plus or minus three percent; d) dissolved oxygen varies no more than plus or minus 10%, or is less than 0.5 mg/L; e) redox potential varies no more than plus or minus 10 mV; and f) turbidity varies no more than plus or minus 10%, or is less than 5 NTU. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

2. Monitoring Well Purging: If, after one hour of purging, three consecutive readings taken at three- to five-minute intervals show that: a) pH varies no more than plus or minus 0.1 Standard Units; and b) conductivity varies no more than plus or minus 3%, purging may be considered complete. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

3. Monitoring Well Purging: If parameters have not stabilized after five well volumes have been purged from the well casing, purging may be considered complete. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

4. The permittee shall submit a potentiometric map in each semiannual report showing: 1) the locations of all monitored wells and piezometers; 2) waste disposal areas; 3) groundwater elevation in each well and piezometer in feet above mean sea level referenced to a USGS datum; and 4) potentiometric contours in feet above mean sea level referenced to a USGS datum. [401 KAR 45:140 Section 2]

5. Groundwater Assessment: The owner or operator shall submit a Groundwater Assessment Report which shall:

a) Be submitted no later than **November 8, 2021**;
b) Define the existence, quality, quantity, areal extent, and depth of groundwater degradation from the facility and the rate and direction of migration of contaminants in groundwater. Contaminant concentrations and groundwater flow rates and directions shall be determined empirically, in a manner sufficient to ascertain current or potential impacts of groundwater pollution from the facility upon both human and ecological receptors;
c) Empirically determine and include the point(s) and mechanism(s) of discharge of polluted groundwater from the site into surface water pursuant to 401 KAR 45:160, Section 5(4);

d) Include all new data collected, an analysis of both new and preexisting data used or obtained in the assessment investigation, and recommendations on the necessity for the abatement of groundwater pollution. Recommendations on the necessity for the abatement of groundwater pollution shall be empirically based and include an evaluation of potential impacts to both human and ecological receptors pursuant to 401 KAR 45:160 Section 5(7); and
e) Evaluate whether groundwater pollution at the facility violates (or has the potential to violate) any provision of the environmental performance standards of 401 KAR 30:031.
[401 KAR 45:140 Section 2, 401 KAR 45:160]

6. Groundwater monitoring wells shall be constructed and maintained in accordance with 401 KAR 45:160 Section 3, 401 KAR 6:350, the permit, and the approved plans. [401 KAR 45:140 Section 1(1), 401 KAR 45:160 Section 3, 401 KAR 6:350]

7. No monitoring well construction, maintenance, or abandonment may be conducted without prior approval by the Division of Waste Management. [401 KAR 45:140 Section 1(1), 401 KAR 6:350 Section 12(1)]

8. Groundwater Well Construction: The owner or operator shall comply with the standards and provisions in 401 KAR Chapter 6. This includes, but not limited to, the provision each monitoring well shall be constructed, modified, or abandoned by a monitoring well driller or monitoring well driller assistant certified in accordance with KRS 223.425 and 401 KAR 6:320. [401 KAR 6:350]

9. Groundwater Well Construction: The Division of Waste Management shall be notified at least ten (10) working days prior to monitoring well construction, modification, or abandonment so that a cabinet representative may be present at the construction, modification, or abandonment. [401 KAR 6:350 Section 12]

GSTR0002 - Groundwater Monitoring - SWB: (Phase II monitoring wells)

Group Members: STRC0031 - Well MW-5; STRC0032 - Well MW-6; STRC0033 - Well MW-8; STRC0034 - Well MW-7; STRC0036 - Well MW-10

Standard Requirements:

1. The owner or operator shall satisfy the requirements of 401 KAR 45:160 for all wastes and waste constituents contained in the site or facility. [401 KAR 45:160 Section 1]

2. The permittee shall monitor for other parameters as required by the cabinet. [401 KAR 45:160 Section 8(2)(c)]

3. The owner or operator shall monitor groundwater on the approved schedule at each approved groundwater monitoring location in accordance with 401 KAR 45:160, the permit, and the approved plans. A table summarizing the parameters to be monitored, their respective limits and monitoring frequency is included herein. [401 KAR 45:160, 401 KAR 45:140 Section 1(1)]

4. The owner or operator shall conduct statistical analysis of the groundwater data in accordance with 401 KAR 45:160 Section 6 and the approved applications. The statistical test chosen shall be conducted separately for each parameter in each well for each monitoring event. The results shall be maintained as part of the facility record

throughout the operating and postclosure life of the facility. [401 KAR 45:160 Section 6, 401 KAR 45:140 Section 1(1)]

5. The groundwater analytical data and statistical analysis shall be submitted on forms provided by the cabinet, within sixty (60) days after sampling or 15 days of the completion of statistical analysis, whichever is sooner. [401 KAR 45:160 Section 4]

6. If the analysis of groundwater sample results indicates contamination (i.e., a statistical or MCL exceedence) as specified in 401 KAR 45:160 Section 5, the owner or operator shall notify the cabinet within (forty-eight) 48 hours of receiving the results and shall arrange to split samples no later than ten (10) days from the receipt of the results. [401 KAR 45:160 Section 5]

7. The owner or operator shall provide alternate water supplies to all affected parties within twenty-four (24) hours of notification of the cabinet that sample results indicate contamination of a drinking water supply if it has been determined that the special waste site or facility is the probable source of the contamination. [401 KAR 45:160 Section 3]

Variances, Alternate Specifications and Special Conditions:

1. Monitoring Well Purging: Monitoring wells shall be purged using low-flow sampling equipment, at flow rates between 100 and 500 milliliters per minute. Drawdown during purging shall not exceed 0.5 feet. Purge water shall be passed through a calibrated flow cell until three consecutive readings taken at three- to five-minute intervals show that: a) pH varies no more than plus or minus 0.1 Standard Units; b) conductivity varies no more than plus or minus 3%; c) temperature varies no more than plus or minus three percent; d) dissolved oxygen varies no more than plus or minus 10%, or is less than 0.5 mg/L; e) redox potential varies no more than plus or minus 10 mV; and f) turbidity varies no more than plus or minus 10%, or is less than 5 NTU. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

2. Monitoring Well Purging: If, after one hour of purging, three consecutive readings taken at three- to five-minute intervals show that: a) pH varies no more than plus or minus 0.1 Standard Units; and b) conductivity varies no more than plus or minus 3%, purging may be considered complete. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

3. Monitoring Well Purging: If parameters have not stabilized after five well volumes have been purged from the well casing, purging may be considered complete. [401 KAR 45:140 Section 1, 401 KAR 45:140 Section 2]

4. The permittee shall submit a potentiometric map in each semiannual report showing: 1) the locations of all monitored wells and piezometers; 2) waste disposal areas; 3) groundwater elevation in each well and piezometer in feet above mean sea level referenced to a USGS datum; and 4) potentiometric contours in feet above mean sea level referenced to a USGS datum. [401 KAR 45:140 Section 2]

5. Groundwater monitoring wells shall be constructed and maintained in accordance with 401 KAR 45:160 Section 3, 401 KAR 6:350, the permit, and the approved plans. [401 KAR 45:140 Section 1(1), 401 KAR 45:160 Section 3, 401 KAR 6:350]

6. No monitoring well construction, maintenance, or abandonment may be conducted without prior approval by the Division of Waste Management. [401 KAR 45:140 Section 1(1), 401 KAR 6:350 Section 12(1)]

7. Groundwater Well Construction: The owner or operator shall comply with the standards and provisions in 401 KAR Chapter 6. This includes, but not limited to, the provision each monitoring well shall be constructed, modified, or abandoned by a monitoring well driller or monitoring well driller assistant certified in accordance with KRS 223.425 and 401 KAR 6:320. [401 KAR 6:350]

8. Groundwater Assessment: Groundwater contamination assessment and corrective action shall be performed in full compliance with all provisions of 401 KAR 45:160 Section 5; the owner or operator shall be required to prepare and submit a groundwater contamination assessment plan if laboratory analyses of one (1) or more public or private water supplies or monitoring wells at the site shows the presence of one (1) or more parameters above the maximum contaminant level (MCL) as specified in 401 KAR 30:031 or a statistically significant increase over background levels for parameters that have no MCL. The owner or operator shall comply with the provisions of this group, referenced as GSTR0002; the data gathered may be used in the groundwater assessment process in accordance with the technical provisions of 401 KAR Chapter 45. The approval of the groundwater assessment plan, referenced as AIN20140001, in no way constitutes Division of Waste Management acceptance or concurrence with any technical provision pursuant to 401 KAR Chapter 46. [401 KAR 45:140 Section 2, 401 KAR 45:160 Section 5]

9. Groundwater Well Construction: The Division of Waste Management shall be notified at least ten (10) working days prior to monitoring well construction, modification, or abandonment so that a cabinet representative may be present at the construction, modification, or abandonment. [401 KAR 6:350 Section 12]

GSTR0003 - Groundwater Monitoring - SWB: Piezometer Monitoring Group

Group Members: STRC0035 - Well P-9; STRC0037 - Well P-11
Variances, Alternate Specifications and Special Conditions:

1. These piezometers are for monitoring static water levels for groundwater flow determination. [401 KAR 47:160]

GSTR0004 - Groundwater Monitoring - SWB: Chapter 46 Groundwater Monitoring Group

Group Members: AIOO3319 - Agency Interest #3319

Variances, Alternate Specifications and Special Conditions:

1. Groundwater Monitoring: The owner or operator shall monitor groundwater and provide notifications in accordance with 401 KAR Chapter 46 and submit the results and analysis to the Division of Waste Management, Solid Waste Branch upon request. [401 KAR 45:030, 401 KAR 46:110 Section 10, 401 KAR 46:110 Section 8]

PERMIT

GSTR0005 - Groundwater Monitoring - SWB: Chapter 6 Groundwater Monitoring Group

Group Members: AIOO3319 - Agency Interest #3319

Variances, Alternate Specifications and Special Conditions:

1. Groundwater Well Construction: Prior to the installation, modification, or abandonment of a monitoring well at a unit regulated by the Division of Waste Management (DWM), the permittee shall obtain DWM approval of all monitoring-well construction designs and all monitoring-well construction materials. The approval request shall be submitted to the Solid Waste Branch of the DWM. [401 KAR 6:350 Section 12]

2. Groundwater Well Construction: The Division of Waste Management shall be notified at least ten (10) working days prior to monitoring well construction, modification, or abandonment so that a cabinet representative may be present at the construction, modification, or abandonment. [401 KAR 6:350 Section 12]

3. Groundwater Well Construction: The owner or operator shall comply with the standards and provisions in 401 KAR Chapter 6. This includes, but not limited to, the provision each monitoring well shall be constructed, modified, or abandoned by a monitoring well driller or monitoring well driller assistant certified in accordance with KRS 223.425 and 401 KAR 6:320. [401 KAR 6:350]

4. Reports and Submittals: For recordkeeping purposes and in order to verify compliance with 401 KAR Chapter 6 standards, the owner or operator shall submit a Construction Progress Report (CPR) within 45 days of the completion of any groundwater monitoring well installation, modification, or abandonment activities. [401 KAR 45:140 Section 1(8), 401 KAR 6:350]

Groundwater Monitoring Limits:

Subject Item	CAS Number	Parameter	Frequency	Lower Limit	Upper Limit	Units	Statistical Limit	Report Only
GSTR0001	7440-36-0	Antimony, Total (as Sb)	semiannually		0.006	mg/L		
GSTR0001	7440-38-2	Arsenic, Total (as As)	semiannually		0.010	mg/L		
GSTR0001	7440-39-3	Barium, Total (as Ba)	semiannually		2.0	mg/L		
GSTR0001	7440-41-7	Beryllium, Total	semiannually		0.004	mg/L		
GSTR0001	7440-42-8	Boron	semiannually			mg/L	Yes	
GSTR0001	7440-43-9	Cadmium, Total (as Cd)	semiannually		0.005	mg/L		
GSTR0001	7440-70-2	Calcium, total [as Ca]	semiannually			mg/L	Yes	
GSTR0001		Carbon, Total Organic	semiannually			mg/L	Yes	
GSTR0001		Chemical Oxygen Demand (COD)	semiannually			mg/L	Yes	
GSTR0001	16887-00-6	Chloride	semiannually			mg/L	Yes	
GSTR0001	7440-47-3	Chromium, Total (as Cr)	semiannually		0.10	mg/L		
GSTR0001	7440-48-4	Cobalt, Total	semiannually			mg/L	Yes	
GSTR0001		Fluoride, Total (as F)	semiannually		4.0	mg/L		
GSTR0001		Groundwater Elevation	semiannually			feet above mean sea level based on a USGS datum		Yes
GSTR0001	7439-89-6	Iron, Total (as Fe)	semiannually			mg/L	Yes	
GSTR0001	7439-92-1	Lead, Total (as Pb)	semiannually		0.015	mg/L		
GSTR0001		Lithium, (Total) as Li	semiannually			mg/L	Yes	
GSTR0001	7439-97-6	Mercury, Total (as Hg)	semiannually		0.002	mg/L		
GSTR0001	7439-98-7	Molybdenum, Total (as Mo)	semiannually			mg/L	Yes	
GSTR0001		Radium 226 + Radium 228, Total	semiannually		5.0	pCi/L		
GSTR0001	7782-49-2	Selenium, Total (as Se)	semiannually		0.05	mg/L		
GSTR0001	7440-23-5	Sodium, Total (as Na)	semiannually			mg/L	Yes	
GSTR0001		Solids, Total Dissolved	semiannually			mg/L	Yes	
GSTR0001		Specific Conductance	semiannually			umhos/cm	Yes	
GSTR0001	14808-79-8	Sulfate	semiannually			mg/L	Yes	
GSTR0001		Temperature, Water Deg. Fahrenheit	semiannually			degrees Fahrenheit		Yes
GSTR0001	7440-28-0	Thallium, Total	semiannually		0.002	mg/L		
GSTR0001		pH	semiannually			S.U.	Yes	
GSTR0002	7440-36-0	Antimony, Total (as Sb)	semiannually		0.006	mg/L		
GSTR0002	7440-38-2	Arsenic, Total (as As)	semiannually		0.010	mg/L		

Subject Item	CAS Number	Parameter	Frequency	Lower Limit	Upper Limit	Units	Statistical Limit	Report Only
GSTR0002	7440-39-3	Barium, Total (as Ba)	semiannually		2.0	mg/L		
GSTR0002	7440-41-7	Beryllium, Total	semiannually		0.004	mg/L		
GSTR0002	7440-42-8	Boron	semiannually			mg/L	Yes	
GSTR0002	7440-43-9	Cadmium, Total (as Cd)	semiannually		0.005	mg/L		
GSTR0002	7440-70-2	Calcium, total [as Ca]	semiannually			mg/L	Yes	
GSTR0002		Carbon, Total Organic	semiannually			mg/L	Yes	
GSTR0002		Chemical Oxygen Demand (COD)	semiannually			mg/L	Yes	
GSTR0002	16887-00-6	Chloride	semiannually			mg/L	Yes	
GSTR0002	7440-47-3	Chromium, Total (as Cr)	semiannually		0.10	mg/L		
GSTR0002	7440-48-4	Cobalt, Total	semiannually			mg/L	Yes	
GSTR0002		Fluoride, Total (as F)	semiannually		4.0	mg/L		
GSTR0002		Groundwater Elevation	semiannually			feet above mean sea level based on a USGS datum		Yes
GSTR0002	7439-89-6	Iron, Total (as Fe)	semiannually			mg/L	Yes	
GSTR0002	7439-92-1	Lead, Total (as Pb)	semiannually		0.015	mg/L		
GSTR0002		Lithium, (Total) as Li	semiannually			mg/L	Yes	
GSTR0002	7439-97-6	Mercury, Total (as Hg)	semiannually		0.002	mg/L		
GSTR0002	7439-98-7	Molybdenum, Total (as Mo)	semiannually			mg/L	Yes	
GSTR0002		Radium 226 + Radium 228, Total	semiannually		5.0	pCi/L		
GSTR0002	7782-49-2	Selenium, Total (as Se)	semiannually		0.05	mg/L		
GSTR0002	7440-23-5	Sodium, Total (as Na)	semiannually			mg/L	Yes	
GSTR0002		Solids, Total Dissolved	semiannually			mg/L	Yes	
GSTR0002		Specific Conductance	semiannually			umhos/cm	Yes	
GSTR0002	14808-79-8	Sulfate	semiannually			mg/L	Yes	
GSTR0002		Temperature, Water Deg. Fahrenheit	semiannually			degrees Fahrenheit		Yes
GSTR0002	7440-28-0	Thallium, Total	semiannually		0.002	mg/L		
GSTR0002		pH	semiannually			S.U.	Yes	

APPENDIX B – BREC 10-DAY NOTIFICATION LETTER TO KDWM

Big Rivers
ELECTRIC CORPORATION

D.B. Wilson Station
5663 State Rt. 85 West
Centertown, KY 42328

November 15, 2021

Danny Anderson, P.E.
Manager, Solid Waste Branch
Kentucky Division of Waste Management
Kentucky Department of Environmental Protection
300 Sower Boulevard
Frankfort, Kentucky 40601

Cc: Kevin Patrick, Environmental Scientist V (copied via email)
Todd Hendricks, Environmental Scientist V (copied via email)

Re: Big Rivers Electric Corporation, D.B. Wilson Station Special Waste Landfill
Agency Interest No. 3319
Application I.D. No. AIN20140001
Ten day notification for drilling new groundwater monitoring wells

Mr. Anderson,

Big Rivers Electric Corporation (BREC) received a revised permit for the D.B. Wilson Station Special Waste Landfill on August 4, 2021. Permit SW09200004 was revised for the conditional approval of the Groundwater Assessment Plan (GWAP). As specified in 401 KAR 45:160, Section 5(4), the GWAP contains the planned scope for the installation of five new groundwater monitoring wells and the abandonment of one existing groundwater monitoring well.

Big Rivers contracted Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to assure drilling, installation and abandonment of the monitoring wells are performed in accordance with 401 KAR 6:350. Burns and McDonnell will be utilizing a Kentucky certified well driller with Cascade Drilling LP. Cascade Drilling is scheduled to be onsite at D.B. Wilson Station on November 29, 2021 with the work expected to continue through December 10, 2021.

Please accept this correspondence to comply with the official 401 KAR 6:350 Section 12 required notification. Additionally, per his request an email notification is being sent to Kevin Patrick. In accordance with 401 KAR 45:140 Section 1(8) and 401 KAR 6:350, a Construction Progress Report (CPR) will be submitted within 45 days of completion of monitoring well installation and abandonment activities.

Please contact Diana Merritt at (270) 844-5008 should you have any questions or concerns.

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person

or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for such violations."

Tracy Cole

Plant Manager, D.B. Wilson Station

APPENDIX C - FIELD PHOTOGRAPHS

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical Roto-Sonic drilling advanced through unconsolidated soils to collect disturbed subsurface soil for logging. Photo looking south at MW-113. 12/9/2021
	Typical soil bag recovered from roto-sonic drilling collected at MW-105R from 8-12 ft below surface (bgs) consisting of highly weathered sandstone. Top of core on left. 12/7/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical change from roto-sonic to high-speed drilling head to be used with wire-line rock coring. Photo looking east at MW-114 12/13/2021
	Typical setup of wire-line rock coring using PQ sized bit. Utilized water trough to contain and transfer water from drilling into containers. Photo looking southeast at MW-113. 12/10/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical rock core from bedrock sandstone taken at MW-114 from 41-46ft bgs. Grey, fine-grain, quartz-rich sandstone, some black organic laminae, few healed fractures. Breaks in core representative of mechanical fracture during rock coring. Top of run on left. 12/20/2021
	Typical decontamination of drill rods after roto-sonic drilling and wire-line coring. Photo taken looking south at centralized decontamination pad located northwest of MW-113. 12/9/21

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical decontamination of drilling rig. 1/6/2022
	Typical process of adding 6-inch filter pack sand cushion at bottom of borehole before installing well. Photo looking south at MW-114. 12/21/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical stainless-steel centralizers installed on wells over 50-foot in depth. Centralizers placed 1-foot above top of screen and every 10-ft thereafter. Photo taken at MW-111. 1/8/2022
	Typical monitoring well installation after adding 6-inch filter pack sand buffer at bottom of borehole. Photo taken looking south at MW-113. 11/4/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical addition of sand filter pack in annular space around screened interval. Drill casing removed while placing sand filter pack to prevent borehole collapse during well construction. Photo looking west at MW-112. 1/4/2022
	Typical addition of 3/8-inch coated bentonite pellets for minimum 2-foot-thick bentonite seal on top of sand filter pack. Photo taken facing southwest on MW-113. 12/12/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical mixing of high-solids bentonite grout. Approximately 48 gallons of potable water for two 50lb bags of grout as recommended by manufacturer. Photo taken facing southeast at MW-112. 1/5/2022
	Typical pumping of grout into boring through drill casing using grout pipe. Photo taken facing east on MW-112. 1/5/2022

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical construction of 3-foot x 3-foot well pad. Photo taken facing northwest at MW-113 12/14/2021
	Typical install of outer protective steel casing pressed into wet concrete. Photo taken facing north at MW-113. 12/14/2021

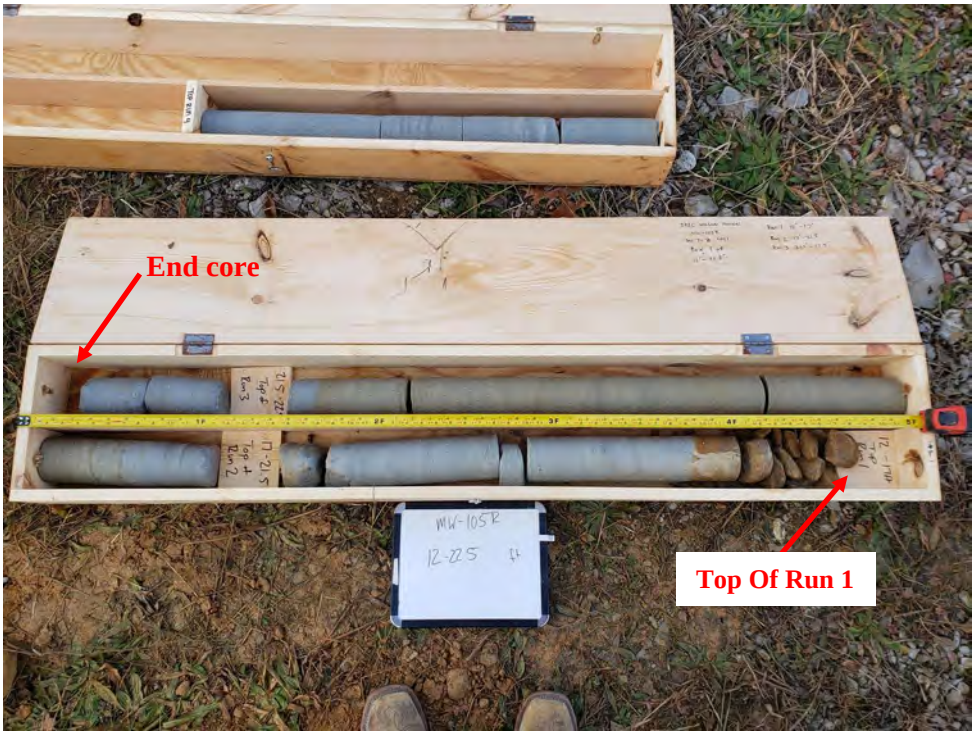
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical finished well pad and protective steel casing. Photo taken facing east on MW-105R. 12/12/2021
	Typical completed monitoring well with completed well pad and bollards. Photo taken facing south east at MW-10D. 1/12/2022

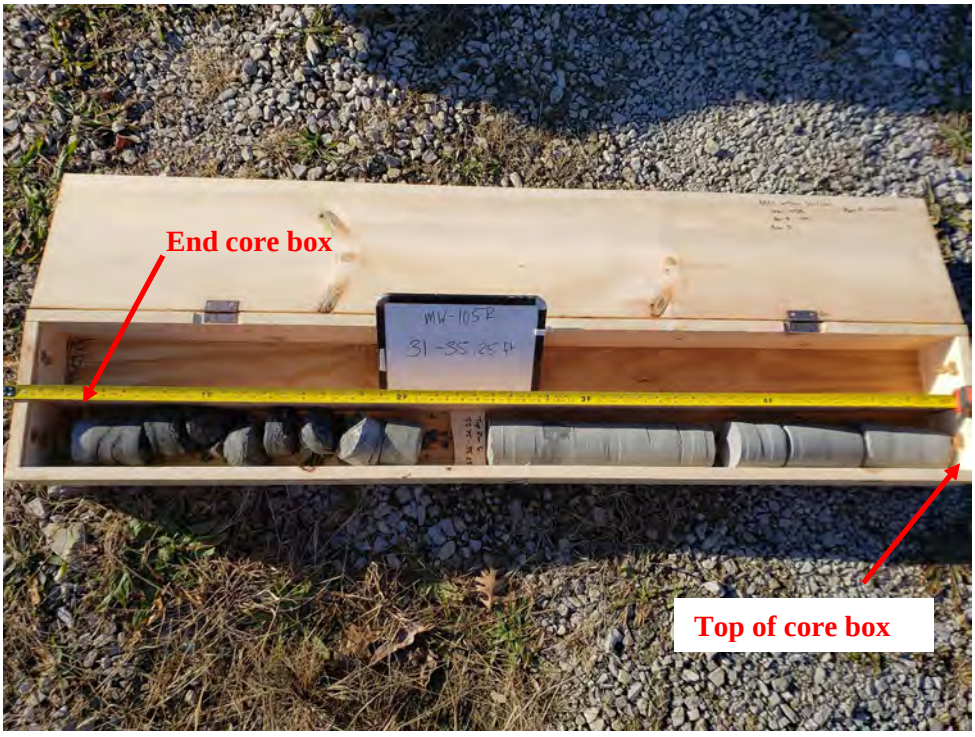
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Typical setup for well development using a submersible electric pump. Photo taken facing northwest at MW-113. 12/14/2021
	Core box of rock cores taken from 12-22.5 feet bgs at MW-105R. Box 1 of 3. Top of Run 1 on bottom right of core box. 12/8/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 22.5-31 feet bgs at MW-105R. Box 2 of 3. Top of core box on bottom right. 12/8/2021
	Core box of rock cores taken from 31-35.25 feet bgs at MW-105R. Box 3 of 3. Top of core box on bottom right. 12/8/2021

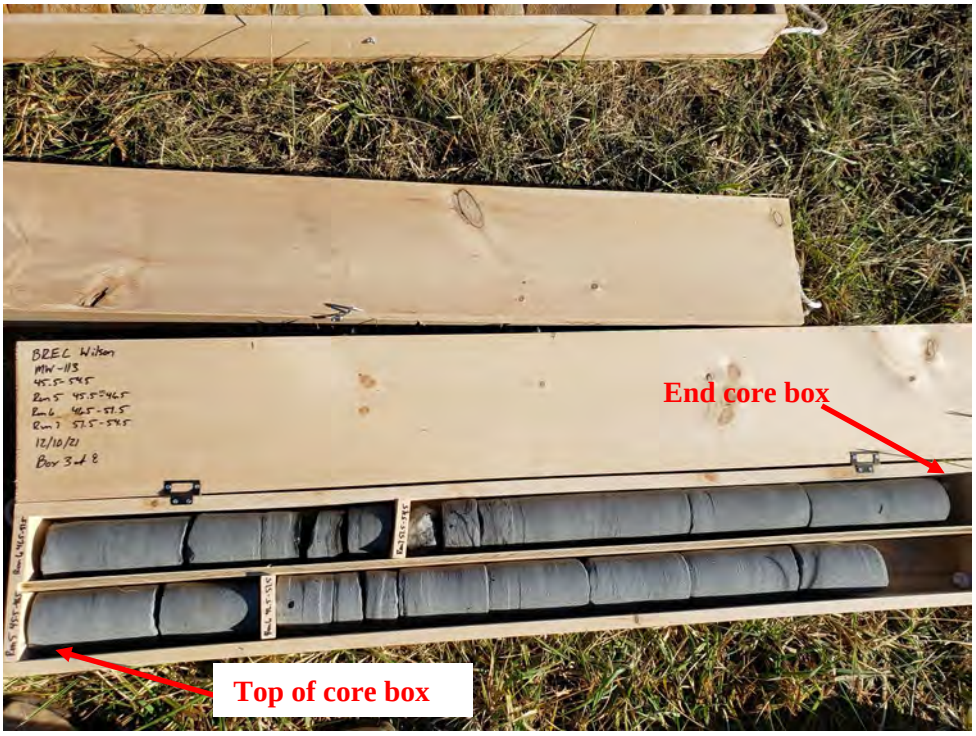
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 24.5-35 feet bgs at MW-113. Box 1 of 8. Top of core box on bottom left. 12/10/2021
	Core box of rock cores taken from 35-45.5 feet bgs (bottom box) at MW-113. Box 2 of 8. Top of core box on bottom left. 12/10/2021

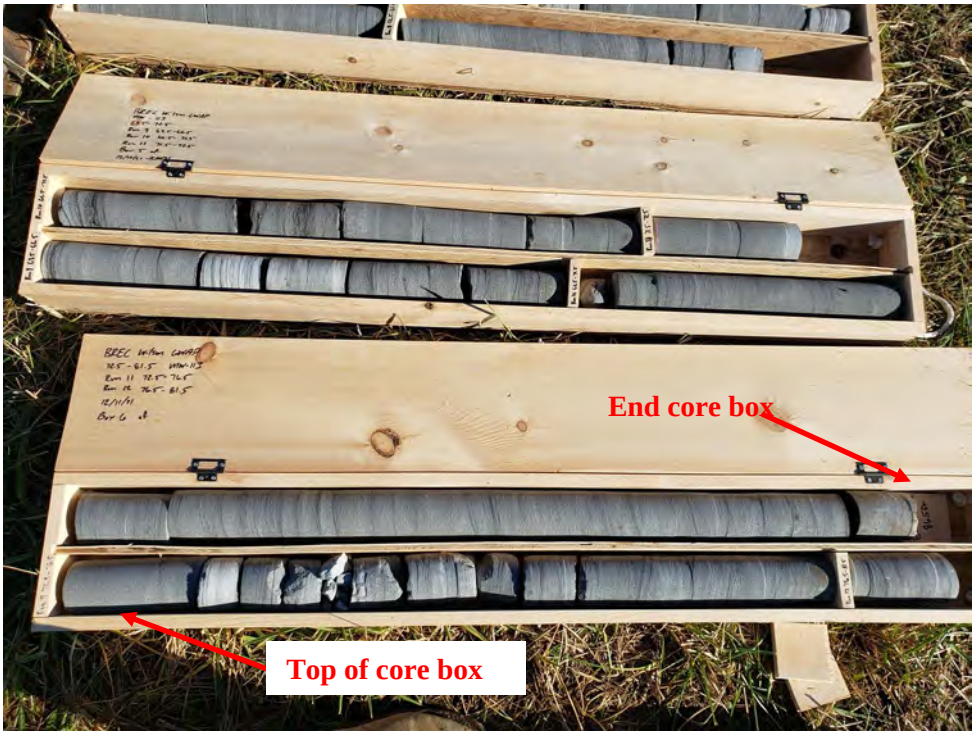
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 45.5-54.5 feet bgs at MW-113. Box 3 of 8. Top of core box on bottom left. 12/10/2021
	Core box of rock cores taken from 54.5-63.5 feet bgs (bottom box) at MW-113. Box 4 of 4. Top of core box on bottom left 12/10/2021

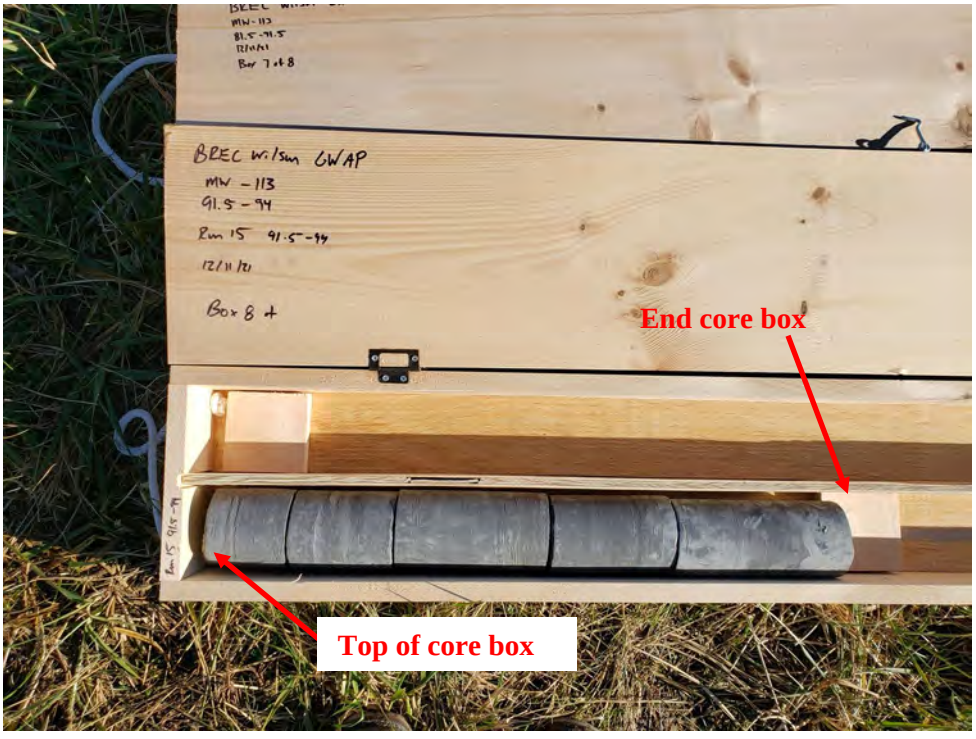
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 63.5-72.5 feet bgs (bottom box) at MW-113. Box 5 of 8. 12/10-12/11/2021
	Core box of rock cores taken from 72.5-81.5 feet bgs (bottom box) at MW-113. Box 6 of 8. Top of core box on bottom left. 12/11/2021

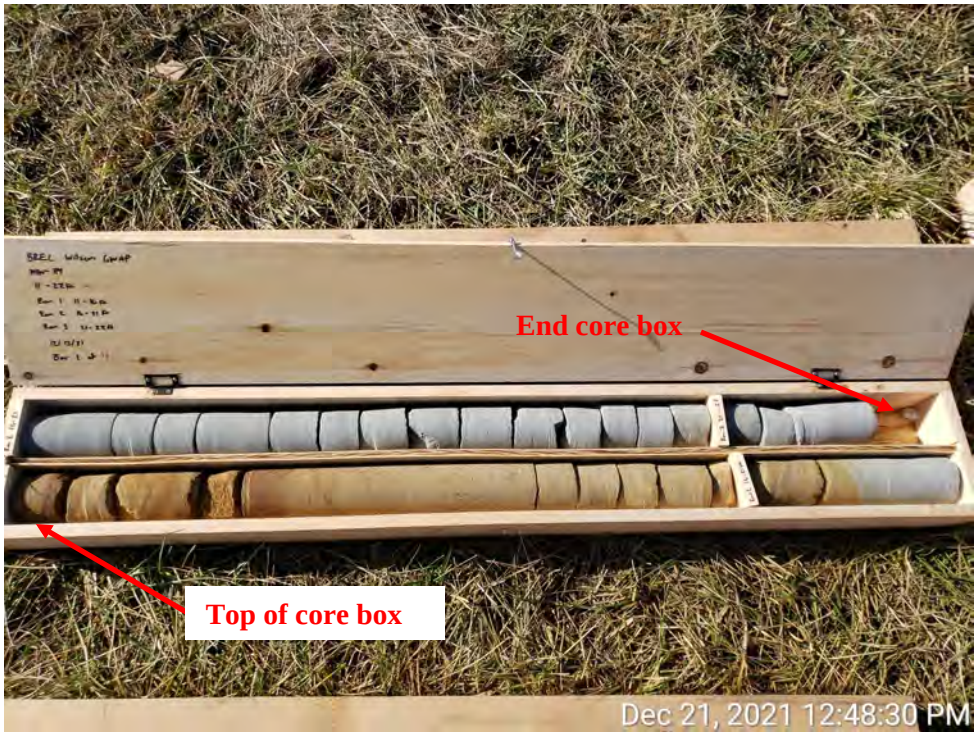
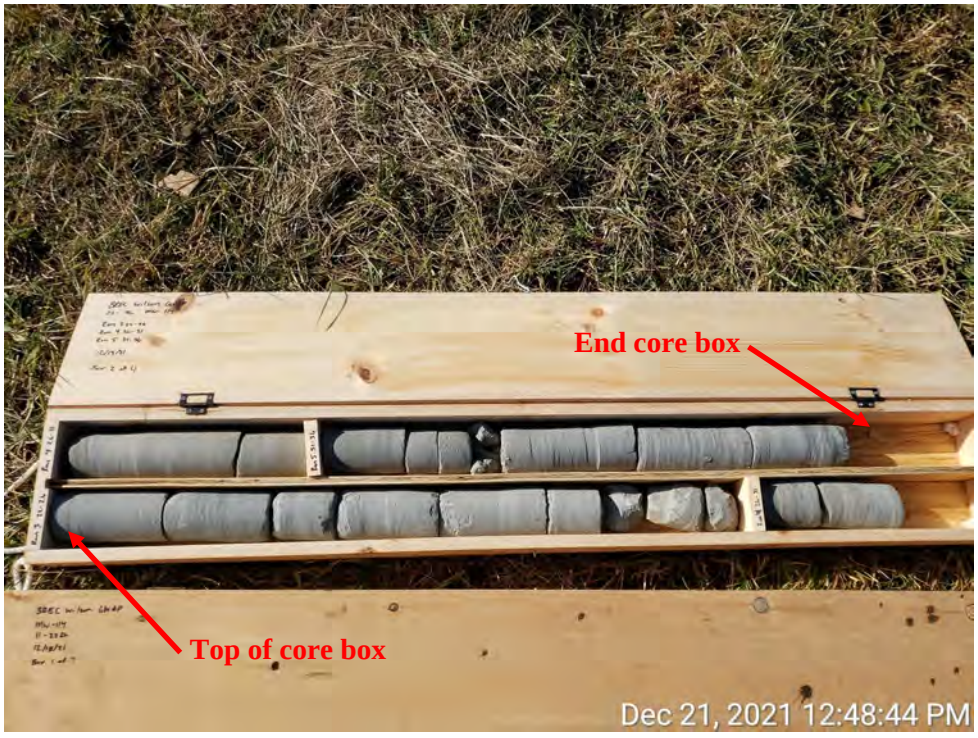
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 81.5-91.5 feet bgs (bottom box) at MW-113. Box 7 of 8. Top of core box on bottom left. 12/11/2021
	Core box of rock cores taken from 91.5-94 feet bgs at MW-113. Box 8 of 8. Top of core box on bottom left. 12/11/2021

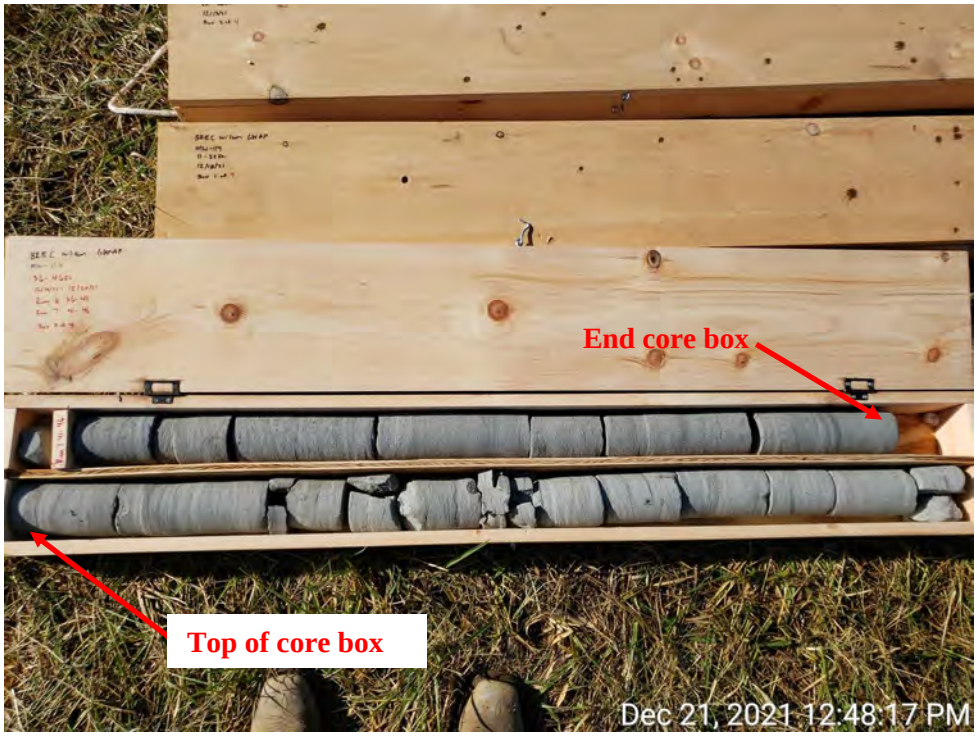
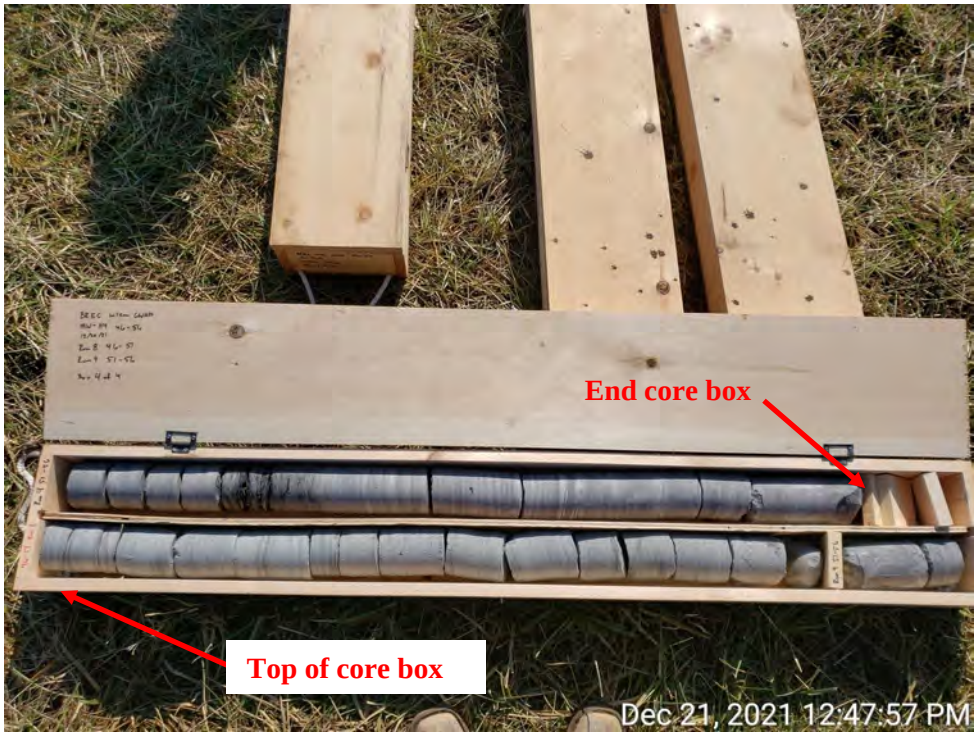
APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 11-22 feet bgs at MW-114. Box 1 of 4. Top of core box on bottom left. 12/13/2021
	Core box of rock cores taken from 22-36 feet bgs at MW-114. Box 2 of 4. Top of core box on bottom left. 12/13/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Core box of rock cores taken from 36-46 feet bgs at MW-114. Box 3 of 4. Top of core box on bottom left. 12/13-12/20/2021
	Core box of rock cores taken from 46-56 feet bgs at MW-114. Box 4 of 4. Top of core box on bottom left. 12/20/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Mine Spoils at MW-10D from 60-70 ft bgs. Top of run on the left. 1/10/2022
	Suspected mine spoils at MW-112 from 46-57 ft bgs. top of core's on left. 1/3/2021

APPENDIX C – SITE PHOTO LOG

Monitoring Well Construction Progress Report
Big Rivers Electric Corporation – Wilson Station
Centertown, Kentucky

Photograph	Description
	Suspected Mine Spoils at MW-111 from 50-55 ft bgs. Top of core on right. 12/13-12/20/2021

APPENDIX D – DOWNHOLE CAMERA VIDEOS
(PROVIDED ON CD)

APPENDIX E – FIELD LOGBOOK

Monday December 7, 2021

Weather: 50's clear

Personnel: Chris Hoglund, Josh Frasher

Task: site orientation & recon

1445 Arrive on-site - Gate #3

1450 Cascade on-site (4)

1515 Meet BREC Mike Galbraith & Travis Sneed at security shed @ Gate #3 scan

1525 Escort to Gate 1 ~ recon MWs locations + H2O with driller

1530 Josh on-site

1600 Watch BREC safety video @ Gate #1

1630 Get BREC card after safety quiz

1700 off-site

Tuesday December 8, 2021

Weather: AM: 30's-

PM:

Personnel: Chris Hoglund Josh Frasher

Task: MW Install

0630 Arrive on-site Gate #3 + Cascade on-site (4)

0645 Complete PTA + SOW meeting

0700 Setup staging area & decon pad south of MW-113 along access road.

0825 Mike + Travis (BREC) on-site

0830 Cascade ball w/ water - prep for decon

0840 Start decon

0910 Complete decon - mobilize to MW-105R

0926 Arrive @ MW-105R

0935 Cascade setting up @ MW-105R - part issue

1030 Kevin Patrick (KRUM on-site), T. Sneed onsite with S.Sneed part. 1040 Travis off-site

1057 Start drilling @ MW-105R Sonic 4x6 system

1115 Setscrew failure - added sealant to set screw let set, ordered new replacement part, cascade off-site. ~6' Drilled

1130 Mike Galbraith off-site

1211 Cascade on-site

1220 Resume drilling

1240 Stop sonic @ 12' BGS - sandstone, switch to

Rite in the Rain

1455 Resume drilling w/ PQ coring
1615 Stop for day @ 17' BGS

C. Hoglund
J. Frasher
12/8/21

Wednesday December 8, 2021
Weather: AM: Partly cloudy 30's
PM:
Personnel: Chris Hoglund + Josh Frasher
0632 Arrive on-site, check in @ Gate 63
0638 Arrive @ MW-105R, Josh (BMCO) on-site
Cascade (4) on-site
0700 Complete PTA + SCW today - Cascade getting water.
0705 Resume drilling PQ coring @ 17' BGS
0750 Mike Gallerani (BREC) on-site
0
0930 Travis Speed (BREC) on-site
0937 MW-105 WL: 9.98' BTOC - 6.28' BGS
stickup - 3.7' TD: 63.46' BTOC
Travis removed / kept MW-105 Pump + tubing
0938 MW-105R WL: 9.21' TOC stickup: 2.6', WL: 6.61' BGS
TD: 39.14' TOC
0953 MW-105 WL: 7.53' BTOC
1015 MW-105 WL: 7.52' BTOC
Kevin Patrick (KDWM) on-site
1016 MW-105R WL: 9.14' TOC
11
1120 Complete downhole camera
1121 MW-105R WL: 36.57' BTOC

Rite in the Rain

6 C. Hoglund
J. Frasher

12/8/21

1130 105R WL= 36.31

1133 105R WL= 36.95

MW-105R End Cap = 0.23'

Screen = 10.01' ~~+10.02~~ CH 10.02

Casing = 10.00 + 10.02 + 10.01

40.27' total well casing

Borehole TD = 36'-2"

Bottom Sand = ~~34'-11"~~ CH Sand Bags 1/2 1/2

~~34'-11"~~ 35'-8" Bottom well

Screen = ~~34'-11" - 24'-6"~~ CH 35'-8" - 25'-8"

Top Sand - 23'-00"

1201 Bentonite Seal 3/8" PEL PLUG - coated pellets

23'-21'

1205 H/brake bentonite seal w/ potable water

1210 Cascade Lunch Break, 3.92'

MW-105R - cut off 3'-11" TOC at MW-105R

1255 Cascade switch over PQ systems to sonic casing

1430 Grout setup @ MW-105R ~~@~~ 1445 complete grout

1505 MW-105R WL= 16.49' BTOC stick-up= 1.25'

1535 Setup @ MW-105 to abandon after decon rig, using new/clean tooling.

1540 MW-105R WL= 13.10' BTOC stacking: 36.35'

1555 Kevin off-site

1630 BMcD / Cascade offsite

12/8/21

12/9/21

7

J. Frasher

Date: Thursday December 9th, 2021

Weather: 35-61°F, Sunny to overcast, S 17mph

Task: Well Removal, Decon

Personnel: Josh Frasher

0630 BMcD on site, Cascade on site

0640 Morning safety meeting

0650 Begin Sonic drilling on MW-105 for abandonment. Mike Baltonwith on site

0724 will have to start using water with drilling

0915 TD 60ft bgs begin pulling out

0924 Prep for grout

0936 Assemble tremie tube for grout

0943 Begin mixing grout

0945 MW-105R WL: 7.08ft TOC: 1.25ft

0953 finish grouting pull up tremie tube 3 bags of grout total used 72 gallons of water

1000 Kevin on site

Clean out Tremie tube / Rig

1002 Begin clean up and tear down to move rig

1030 Begin moving to MW-113

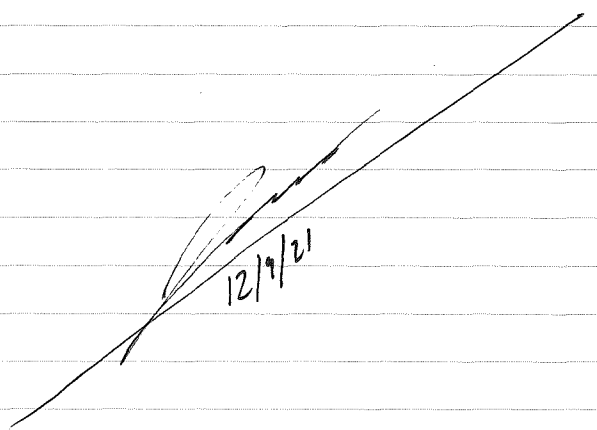
1033 use bobcat to clean up area and level out road

Rite in the Rain

12/9/21

J. Frasher

1103 Begin set-up on MW-113
1105 Setup Decon
1122 Begin Decon
1220 Finish Decon. Cascade takes lunch
1240 pump decon water into containment drum
move rig over and decon rig
1306 Setup rig at MW-113
Rig has code on computer. Trying to figure out what code is for
1401 Begin sonic drilling at MW-113
1420 Rigs coolant sensor tripped and have to get fixed
1446 Have to drive to louisville to get part
Russ (head driller) offsite
1500 Cascade offsite
1510 BMCD offsite



J. Frasher

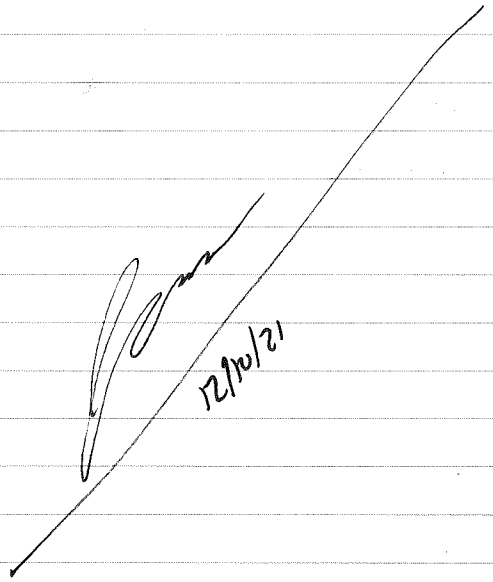
Date: Friday December 10th, 2021
Weather: 57-69°F, Scattered T-Storms in afternoon, SSE 10-15
Task: MW Instal / Drilling
Personnel: Josh Frasher

0630 BMcD onsite. Cascade already on site
0635 Coolant sensor repair part was wrong part. Cascade is going to try and bypass it.
0650 Morning safety meeting
0737 Begin sonic drilling @ 10ft bgs on MW-113
0808 Instal casing to 20ft bgs then continue coring with Core barrel
Begin using water
0840 Short break
0845 Kevin on site
0847 Resume Drilling
0910 Bedrock encountered @ 24.5ft. going to continue with sonic another 5ft to see how core Look.
0955 no recovery at 39Ft bgs. Core fell back in, going to try and retrieve it
1100 Cascade break for lunch
1106 Talk with Chris Hoglund. going to Change from Sonic to PQ.

Rite in the Rain

J. Frasher 12/10/21

1136 Begin Change over to PA.
1806 Change complete
1308 Begin PA from 39ft bgs
1435 load of Drums for IDW is here
Cascade goes to unload
1452 Resume Coring
1604 end coring for day. going to fill water tanks and prep for storms over night @ 71ft bgs
1630 All personell offsite



J. Frasher
Date: Saturday December 11th, 2021
Weather: 57-42°F, Cloudy windy, 20-25 mph ENE
Task: MW-113 Install
Personell: Josh Frasher

0630 BMCD / Cascade on site
0635 Safety meeting, Warm up rig
0710 Begin Coring from 71ft bgs
0940 Shale found at 91.5 ft bgs
out of Room in drums for IDW
and no drums available.
1010 Pull up drill rods
1030 drop pump down well and begin pumping out boring to use Camera
1055 Set up to decon
1040 begin scoping boring. Draw down is slow
1150 determine screening eff well to be between 45-55 ft bgs
1155 pull up pump and camera
1210 Cascade break for lunch
1250 Return from lunch. fill water tanks and gather supplies for Monitoring well

Rite in the Rain

J. Frasher 12/11/21

1315 Begin adding bentonite pellets to bring up to screened interval
TD: 94ft bgs before adding bentonite

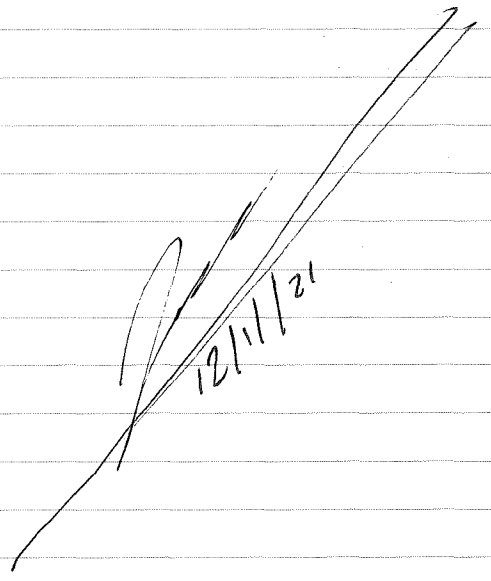
1340 Begin Decon d-rods

1345 Bentonite pellets added to 58.5ft bgs will allow to swell over night 7.5 buckets

1350 Begin partial rig teardown / continue decon

1430 Rig changed back to sonic and winterized

1500 All personell offsite. 29 IDW Drums



J. Frasher 12/12/21

Date: Sunday December 12th, 2021
Weather:
Task: MW-113 Instal
Personnel: Josh Frasher

0630 All personnel on-site
0635 Morning Safety meeting
Begin warming up Rig
0700 MW measurements
Screen length: 9.97 ft
2" pvc stick up: 9.98 ft
2" pvc stick up: 9.97 ft
2" pvc stick up: 9.99 ft
2" pvc stick up: 9.99 ft
2" pvc stick up: 10.1 ft
Depth to bentonite: 58' 8"
Centralizer: 11ft from bottom
2" PVC stick up: 5.0
0715 Begin installing MW-113
0718 Begin adding Sand base to bring bottom of well to 55ft bgs
0730 did not add enough centralizers. Pull up PVC that is not ~~in Sand~~ in Filter-pack
0732 Able to pull up 45 ft of PVC. Will add centralizers every 10ft

Rite in the Rain

J. Fraser 12/12/21

0738 Centralizers at 44ft, 34ft, 24ft, 14ft and 4ft bgs

0741 Begin installing MW-113 that was previously removed with Centralizers

0742 Continue Adding filter pack

0748 Filter pack at 43ft bgs

0750 Begin adding Bentonite pellets

0752 Bentonite pellets to 40ft bgs will let sit for 4hrs to swell

0810 Cascade leaves to get supplies

0830 other Cascade personnel begin digging out around MW-105R for pad

0950 Russ Returns with supplies Begin Construction at well pad

1050 Begin mixing Concrete

1051 push protective casing into Concrete slurry

1110 Finish Concrete pad let sit before sloping.

1115 Cascade break for lunch

1200 Cascade back from lunch

1220 Move back to MW-113 and set up for grout

J. Fraser 12/12/21

1228 begin grouting from 40ft bgs
- 2 bags of grout mixed 48 gallons of water used
- 1½ of grout made is used

1237 begin pulling up tremie tube

1242 begin pulling up outer casing

1360 Cascade goes to get tanks from BREC for IDW water

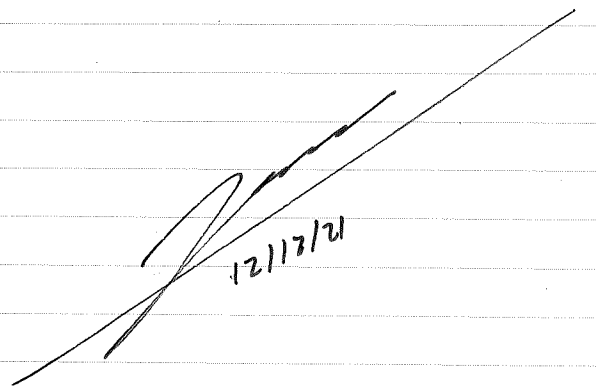
1322 Arrive back with Tank. Pump IDW from overflow tray

1344 Begin Decon

1450 finish decon begin tear down and load up to move to MW-114

1540 Move to MW-113 and begin set up

1630 All personnel offsite



Rite in the Rain

J. Frasher 12/13/21

Date: Monday December 13th, 2021

Weather: 30-56°F, Sunny, light Wind

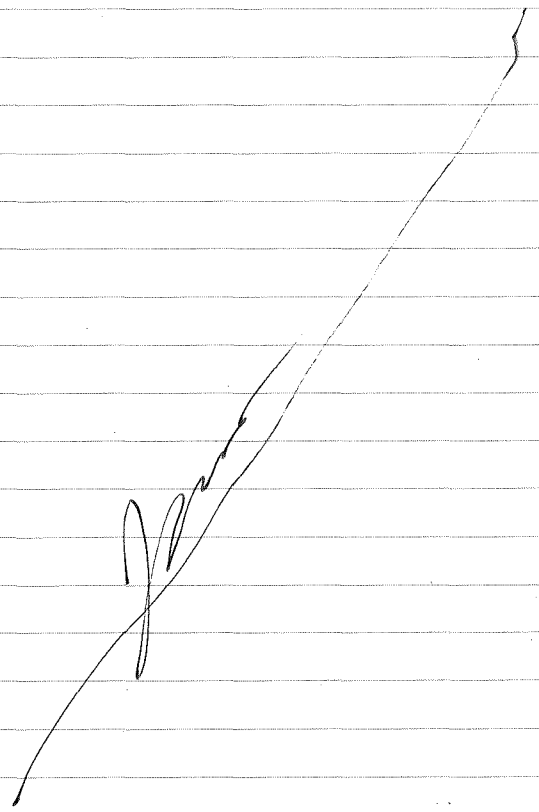
Task: Drilling on MW-114

Personnel: Josh Frasher

0630	BM+D / Cascade on site	
0635	Morning safety meeting	
0640	Warm up Rig	
0655	begin setting up Rig (Boom 3 Rods)	
0705	begin Sonic drilling	
0720	Bedrock hit (weathered sandstone) pull up and install outer casing and switch to PQ coring	
0857	MW-105R WL: 9.7ft stickup: 3.0ft	
0906	MW-113 WL: 19.38ft Bgs	
1003	Change to PQ complete begin Coring from 11ft bgs	
1215	Cascade break for lunch	
1250	Return from lunch resume Coring	
* note *	Cores keep falling back into hole. have to try multiple times to retrieve	
1330	Stop to get another tank for IDW	
1357	Resume Coring	
1430	Bearings on Core barrel went out have spare just need to assemble	

J. Frasher 12/13/21

1500	threads on replacement are different size. will see if there is one at the shop.
1530	All personnel clear



Rite in the Rain

J. Frasher 12/14/21

Date: Tuesday ~~November~~ December 14th, 2021

Weather: 41-62°, Cloudy, SE light winds

Task: Well completions / development

Personnel: Josh Frasher

0630 BMcD/Cascade on site

0635 Morning Safety meeting

0700 Warm up rig

0710 Begin pulling up rods to use Downhole Camera when Stale arrives

0735 move to MW-113 to begin building the pad
MW-113 WL: 19.53 ft from ground surface

0745 move to MW-105R to install bollards before MW-113 completion

0800 MW-105R WL: 9.16ft top of casing
Bottom: 37.81 ft
Water column 28.65ft ~ 4.68 gallons

0813
~~0805~~ Begin Developing MW-105R #1

0815 PH: 7.0, Temp; 14.7°C, Cond: 2.66
Turb: 1993 NU

0817 PH: 7.08 Temp: 16.2 Cond: 1405
Turb: 999 NU

0821 pH: 7.11 Temp: 15.1 Cond: 1801
Turb: 89 NTU

J. Frasher 12/14/21

0832 pH: 7.03 Temp: 14.8 Cond: 1739 Turb: 2495 NU

0833 pump MW-105R DRY

0835 left MW-105R Recharge
begin forming base on MW-113

0940 Install bollards at MW-105R

0950 Decon pump

1005 move to MW-113

1010 Todd Hendricks, Kevin and two others arrive onsite

1026 Stick up: 34½" from ground surface MW-113

1035 Begin mixing concrete on MW-113

1038 place outer casing into Concrete

1105 Move to MW-114 to use downhole Camera

1193 MW-114 WL: 42.9 From clamp
pumped to bottom of boring

1145 look at remaining proposed locations

1200 Cascade breaks for lunch

1230 Return from lunch
trailer is broken, they are trying to see exact problem to get it fixed
Allows time for concrete to set up and wells to recharge

Rite in the Rain

J. Frasher 12/14/21

1315 MW-113 WL: 22.31 Ft TD 57.9 Ft
Top of casing 2.9 ft above ground surface. Beg. Development #1

	pH	Temp	Cond	Turb
1321	7.47	18.0°C	1287	771 AU
1325	7.47	18.1°C	1132	1150 AU
1330	7.42	18.3°C	938	2169

* well volume is 5.81 gallons

1335 pumped dry ~12 gal. will let recharge and try developing again

1544 Wells developed today will not be recharged enough to develop today. Will return tomorrow to develop

1550 boom down on Rig and pick up.
WL at MW-114 16.34 Ft below clamp

1555 Insial Cap on to well

1610 All personnel offsite

12/14/21

J. Frasher 12/15/21

Date: Wednesday December 15th, 2021
Weather:
Task: Well development
Personnel: Josh Frasher

0630 Arrive on site
0635 Morning safety meeting
0640 Beg. development on MW-113 #2

WL: 21.92 Ft

	pH	Temp	Cond	Turb
6.41	7.67	16.6	1080	688 AU

0645 well pumped dry ~6 gallons
0650 Drill weep holes in 113
0700 Arrive at MW-105R
WL: 10.45 Ft
0702 Beg. development on 105R #2

	pH	Temp	Cond	Turb
0703	6.89	15.8	1452	1344 AU
0705	6.95	16.6	1324	76 NTU
0707	6.79	16.7	1355	3094 AU

0709 well pumped dry ~5.5 gallons
0730 All personnel offsite

12/15/21

Rite in the Rain

J. Fraher 12/20/21

Date: Monday December 20th, 2021
Weather: 22-45, Sunny, light winds
Task: Well Development, Drilling
Personnel: Josh Fraher

0650 Cascades BMcD on site
0635 morning safety meeting
0700 Set up to Develop MW-105R
WL: 10.75 Ft
TD: 37.87 Ft
0713 Begin Development #3

	pH	Cond	Temp	Turb
0714	7.22	1310	10.1	N/A
0717	7.03	1289	12.6	0 NTU
0730	7.03	1304	12.1	22 NTU

0737 MW-105R pumped dry ~ 7 gallons
0740 move to MW-113 for Development
0748 MW-113 WL: 23.31 TD: 57.93 Ft
0755 Begin Development #3

	pH	Cond	Temp	Turb
0756	7.34	978	11.9	N/A
0802	7.45	835	13.7	11 NTU
0810	7.43	850	13.2	26 NTU

0820 pumped dry ~ 13.5 gallons
0830 Begin pumping drums into poly tank to empty into Frac tank

J. Fraher 12/20/21

0900 begin pumping into Frac tank
~250 gallons per trip
Number of tanks: TTN TTN ~2500 gal
0945 Jason & Jim with Cascade on site
Jason has to watch safety video
1030 Begin Firing Rig
1100 Begin warming up Rig and setup
1120 Begin Coring from 41ft BGS
1240 Cascade Break for lunch TD: 57ft
1315 Cascade Return from lunch
Begin pulling Core rods
1345 Begin pumping water out on MW-114 for down hole camera
1445 use down hole camera
1500 Water coming in around 42ft bgs going to place well screen from 38-48ft
1530 Begin change back to Sonic
1537 Add bentonite pellets to bring bottom up to 50ft
1550 Continue change over to Sonic
1630 All personnel offsite

12/20/21

Rite in the Rain

J. Frasher 12/21/21

Date: Tuesday December 21st, 2021

Weather: 31-50, partly Cloudy, SSW 5-10 mph

Task: Install MW-114, Decon

Personnel: Josh Frasher

0630 All personnel on site

0635 morning safety meeting

0650 Warm up rig, get supplies for MW-114 Install

0710 Well measurements
Screen 9.99ft
Cap 2.75in
Risers, 10.0, 9.99, 10.0, 9.99

0727 Bentonite at 50ft bgs
begin adding sand to bring up to 48ft bgs

0730 begin installing well

0731 Add sand filter pack

0752 Sand at 36ft bgs begin adding bentonite

0800 Bentonite to 34ft bgs

0810 look at other locations for Decon/Set-up area

0845 Cascade goes to town for supplies

0850 Setup for slug test on MW-113

J. Frasher 12/21/21

0930 Initial WL: 22.17ft

0935 Add Slug

1050 pull slug

1200 finish slug test go to MW-114

1230 Bentonite at 34ft bgs
35ft at Tremie pipe
Begin mixing grout/pumping into boring ~1 bag # 24 gallon Water

1235 finish grouting, pull Tremie tube

1240 Begin tear down of Rig

1300 Todd with state will not approve used grout. Attempt to pump out.

1350 grout is to thick to pump out. try and come up with alternative methods.

1430 pump water (potable) to flush hole

1530 pumped water in and out of boring 5 ¼ times
200 gal total
Pump for last time before measuring

1527 pull up tremie tube to measure Depth. Depth measures 34ft
All around

Rite in the Rain

J. Frasher 12/21/21

1530 Begin moving grout. Pump to top of well
* 500 gal IDW added to frac tank.
1540 Begin pulling Tremie Tube
1 Bag of grout used / 24 gal of water
1550 load up and prep to move
1630 All personell offsite

12/21/21

J. Frasher 12/22/21

Date: Wednesday December 22nd, 2021
Weather: 32 - 40, Sunny, NW 5 to 10 mph
Task: Begin coring on MW 112
Personnel: Josh Frasher

0630 Arrive on site / Cascade on site
0635 Morning safety meeting
0645 Begin moving equipment to MW-112
0700 Begin set up at Decon Between MW 111 & MW 112
0730 Decon location will not work move to original Decon location and setup
0755 Begin Building Decon Pad
0815 Begin Decon
0915 finish Decon, load up and move to MW-112
0930 Begin setup on MW-112
1000 Begin sonic at MW-112
1055 Hard rock Hit. Stop Sonic and start change over to DR
1210 Finish change to PQ. pack up
1230 All personell offsite

12/22/21

Rite in the Rain

1/3/22 J. Fraslar

Date: Monday January 3rd, 2022

Weather: 30-35, partly cloudy, snow flurries, NW 5-10

Task: Coring on MW-112

Personnel: Josh Fraslar

0930 BMCD on site

0945 Cascade on site

0950 morning safety meeting, begin unloading

1020 get water

1047 Return from getting water

1117 Begin Coring from 24ft bgs

1300 Cascade break for lunch

1330 Return from lunch

1450 Stop to get water

1530 Return from getting water

1545 Resume Drilling

1600 WL: 25.69ft top of Rods

1608 Finish drilling at 56ft

Stop for day

1625 MW-114 WL: 10.18ft from TOC

1630 All personnel offsite

1/4/22 J. Fraslar

Date: Tuesday, January 4th, 2022

Weather: 22-45, Sunshine & Clouds, SSE 10-15

Task: MW-112 Install

Personnel: Josh Fraslar

0630: All personnel on site

0635 morning safety meeting

0705 MW-112 WL: 17.58ft from top of Rod

↓ 5ft Rod Removed with ~2ft of Rod exposed

0710 Water pumped from boring to gauge recharge rate. Water level is consistent well pumping.

0735 beg. pulling up rods. will change to sonic and advance to 56ft bgs to ensure no fall in is under bentonite seal.

* Sonic inner diameter 5 3/4"

0850 Begin Sonic from 24 ft bgs

0910 56ft reached with sonic ~4in fall in. beg. pulling up and adding bentonite pellets

0915 Bentonite at 52.5ft bgs Curing at 52ft bgs. 1 bucket used WM 1 of Hydrate for 4 hours

Rite in the Rain

1/4/22 J. Frasher

1027 WL MW-10 : 12.94ft TOC

1032 WL MW-7 : 39.51ft TOC

1045 setup for slug test on MW-105R
WL: 8.89

1100 Begin slug test

1335 End slug test

1350 Top of Bentonite at 52.5ft
PVC lengths
10.05 ft
10.00 ft
10.00 ft
9.98 ft
Screen + Cap: 10.23 ft

1355 Instal centralizers at 41, 31, 21, 11, ~~42, 32, 22, 12 ft 3-2ft~~

1400 begin adding sand to 6" thick

1410 top of sand cushion at 52ft bgs

1412 Begin installing MW

1415 Add filter pack
Casing will be pulled up ~ 6in to 1 ft at a time and sand checked and filled when needed

1503 Sand Filter pack at 40ft bgs
6.5 bags used

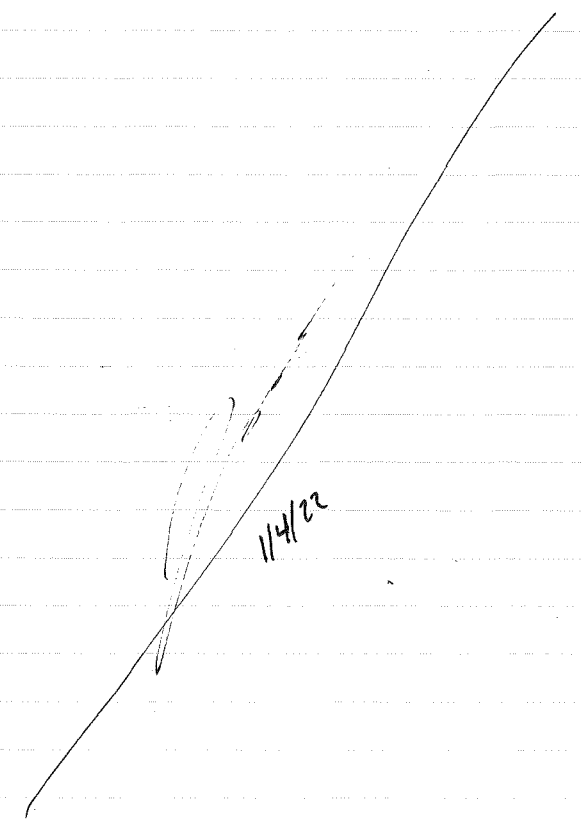
1505 Begin adding Bentonit pellets

1/4/22 J. Frasher

1515 Bentonite seal at ~~30~~ 32 ft bgs
will Allow to hydrate overnite
~8ft bentonite seal
3 buckets total used

1548 WL MW 16 : 42.79

1545 All personnel offsite



1/5/22 J. Fraser

Date: Wednesday January 5th, 2022

Weather: 41-25, ~~cooler~~ Temp dropping throughout day, Cloudy, Breezy

Task: Grout MW-112, Decon

Personnel: Josh Fraser

0630 All personnel on site

0640 morning safety meeting

0650 warm up Rig

0714 Bentonite seal at 32 ft bgs

0720 Beg.- mixing grout 48 gallons water 2 bags of grout

0722 Pump grout through tremie

0746 mix 2 more bags & 48 gallons pump into boring

0747 2 more bags & 48 gall of water pump into boring

0800 Some settled grout in mixing drum. Add 15 gal of water to re mix and pump out into ground.

0810 2 more bags 48 gal of water

0815 Grout level has not come up from 26 ft BGS. trying to get approval from State on useing Bentonite Chips to fill void.

0940 move to MW-114 and add pellets to finish out well

1/5/22 J. Fraser

1023 Beg.- digging pad at MW-114

1100 Beg.- adding pellets (Bentonite) on top of grout to bring up seal and fill void.

1110 Bentonite chips to 22ft bgs will hydrate for 4 hours. Then grout on top

11.33 ~~Begin~~ Setup for development on MW-114

WL: 12.99ft TD: 50.32ft TOC: 2.5 ft

1142 Begin Development:

	pH	Cond	Turb	Temp
1142	7.54	3.11ms	N/A	15.4
1145	7.35	1030 ms	34.7	16.6
1147	7.43	1023	175	14.8

pumped dry ~ 10 gallons

1200 Lunch

1240 WL: 13.1 ft MW-114

1243 Begin purging on MW-114

	pH	Cond	Turb	Temp
1243	7.35	1071	64.2	15.1
1246	7.36	1046	62.9	15.7
1250	7.18	975	38.9	16.5

pumped dry 10 gallons

Rite in the Rain

1/5/22 J. Frashure

1351 MW-114 WL: 13.09

1352 Begin purging

	pH	Temp	Cond	Turb
1353	7.36	14.3	920	6.62
1355	7.26	15.4	997	15.4
1358	7.23	16.6	955	15.2

Pumped dry ~10 gal

1505 prep for grout
Bentonite chips at 22 ft bgs

1306 Begin mixing grout

1307 Begin pumping grout
1 Bag grout 24 gallon water

1512 Mix another batch
1 Bag grout 24 gallon water

1513 pump into boring

1540 mix 1 bag grout 24 gallon water

1541 pump into boring

1600 Talk with Kevin Patrick from State.
he talked with Todd Hendricks
and got Approval to use Bentonite
Chip to seal boring.

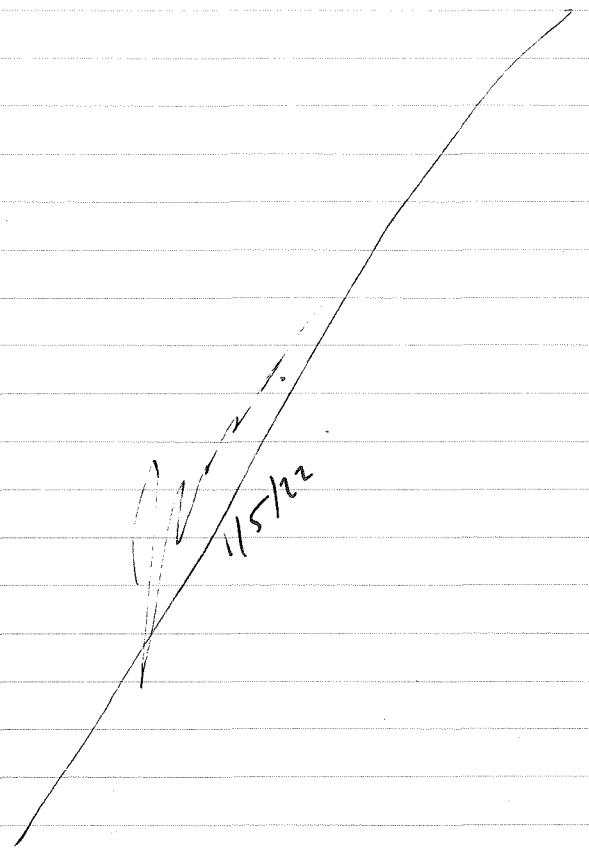
1603 Begin adding Bentonite chips
water table ~15 ft bgs when bentonite
Chips reach 15 ft ½ bag will be
poured and adequately hydrated before
adding more

1/5/22 J. Frashure

1630 Bentonite Chips at 3 ft bgs
3.5 bags used

1635 pack up

1645 All personnel offsite



Rite in the Rain

1/6/22 J. Frasher

Date: Thursday January 6th, 2022
Weather: 21-23, Cloudy Snow, NNW 10 to 15 mph
Task: Decon / Drilling on MW-111
Personnel: Josh Frasher

0630 All personnel on site
0635 morning Safety meeting
0645 Warm up equipment
0706 Begin loading up to move to Decon
0710 MW-112 WL: 18.35 TD: 54.55 TOC: 2.95
0730 move to Decon pad and setup
0815 Water ~~Pump Heater~~ is frozen and needs to thaw before decon
0912 pump thawed begin decon
1012 Finish Decon move to and setup on MW-111
1350 setup ing and Sonic
1620 Finish drilling for day at 90ft bgs winterize
1635 All personnel offsite

1/6/21

1/7/21 J. Frasher

Date: Friday January 7th, 2022
Weather: 0-20°, partly Cloudy, light winds
Task: Drilling & Well instal
Personnel: Josh Frasher

0730 All personnel on site
0735 morning Safety meeting
0750 Begin warming up equipment bet melter
0900 Begin sonic at 90ft bgs
1015 Finish Sonic at 105 Ft bgs
Discuss plan for well instal
1120 Begin advancing outer casing to 95ft bgs
* Talk with Kevin patrizi from state to let him know plan for Instal of MW-111. Well will be installed at 96ft bgs with a 12ft bentonite seal on top of filter pack. Grout will be tremmied in. If a void is encountered bentonite Chips or pellets will be used to backfill/ Seal remainder. Still waiting for approval from state.
1200 Launch

Rite in the Rain

1/7/22 J. Fraher

1425 TD is 105 Ft Bgs on MW-111
Begin adding Bentonite pellets to bring TD up to ~96.5 Ft BGS

1440 TD: 96.5 Ft bgs. will hydrate overnite. Winterize Rig
2.5 buckets used

1450 move to MW-112 to Develop Well
Well volume = 5.91 gallons

1520 Begin Development on MW-112
WL: 18.40 Ft TOC 2.5 gpm

	pH	Cond	Temp	Turb	
1526	7.15	1670	10.8	N/A	Surge
1530	7.12	1244	10.1	105	
1533 1538	7.08	1368	9.4	39.2	
1541 1546	7.07	1355	9.6	16.5	
1543	7.05	1301	10.7	N/A	Surge
1548	7.08	1297	9.4	N/A	Surge
1550	7.12	1290	9.0	N/A	

~55-60 gallons purged. no Draw Down while pumping

1605 All personnel offsite

1/7/22

1/8/22 J. Fraher

Date: Saturday January 8th, 2022
Weather: 14-41°, partly Cloudy rain possible, SSE 5-10
Task: MW-111 install, Decon
Personnel: Josh Fraher

0630 All personnel on sit
0635 Morning Safety meeting
0645 load up supplies
0700 WL: 78.4 Ft bgs Bentonite at 96.5 Ft bgs
Casing lengths
9.98 9.97 10.0 10.0
9.99 10.0 9.99 10.0
Screen length: 9.99 +.25 cap

0730 Begin installing well
Centralizers at ~~1~~, ~~84~~ 85, ~~74~~ 75, ~~64~~ 65, ~~54~~ 55, ~~44~~ 45, ~~34~~ 35, ~~24~~ 25, ~~14~~ 15, 4

0810 Add 6" sand for cushion at bottom 96ft
Place well on top ½ bag at 96ft bgs

0815 begin adding 12 Ft filter pack sand
5Ft pvc with stainless cap fell down hole. Using borehole camera pvc is at bottom of well
Going to Attempt to remove Some of well and fish out The PVC that fell

Rite in the Rain

1/8/22 J. Frasher

1015 was able to get 5ft pvc & Cap out. will reinstal 80ft of well casing removed

1050 Begin adding remainder of filter pack

1152 Sand to 84ft bgs begin adding Bentonite pellets

1202 2 buckets of Pellets gained 3ft to 81ft bgs. have to wait for Russ to get back with more pellets. Winterize Rig.

1210 Lunch

1240 Begin picking up and prep to move to MW-114 and Construct well pad

1307 MW-10 : 12.95 ft

1318 MW-7 : 39.54ft

1330 Begin construction of MW-114 pad 8 bags of Concrete used

1446 Arrive at MW-112 begin digging out pad location

1535 Finish Digging out pad will finish ~~tomorrow~~ Monday.

1600 All personnel offsite

1/8/22

1/10/22 J. Frasher

Date: Monday January 10th, 2022

Weather: 20-38, Sunny, WNW 5-10

Task: MW-111 Install, Decon

Personnel: Josh Frasher

0630 All personnel on site

0635 Morning safety meeting

0645 Begin warming up equipment.

0713 Begin adding pellets on MW-111 82ft bgs Add water for every 1/2 bucket

0725 Bentonite at 70ft bgs

0808 28.5 buckets of pellets used to reach 3ft bgs

0810 Begin picking up & tearing down to move to Decon

0930 Set-up Decon

1000 Start Decon

1030 Finish Decon, pack up & move to MW-10D

1045 Arrive at MW-10D. Begin Setup

1108 Start Coring on MW-10D

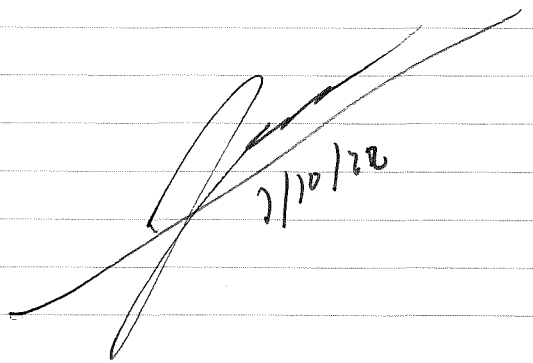
1200 Break for lunch

1258 Return from lunch resume Coring

Rite in the Rain

1/10/22 J. Fraser

1317 hit shale at 74ft bgs TD: 77ft
Stop coring
1318 WL: 10ft bgs
1350 WL: 10ft bgs
Will set well at 75ft
1355 Advance outer casing to 75ft bgs
1400 add bentonite pellets to bring bottom to 75.5 ft bgs
1/2 bucket
1427 Setup slug test at MW-114
1600 Finish slug test at MW-114
* well slug testing Cascade worked on Completion of MW-112 & MW-111. MW-112 pad was completed and MW-111 was dug out and ready to be completed
1630 All personnel offsite



1/11/22 J. Fraser

Date: Tuesday January 11, 2022
Weather: 22-41, Sunny, SSE 5-10
Task: MW-10D construction, pad completions
Personnel: Josh Fraser

0630 Arrive on site, Cascade on site
0635 morning safety meeting
0700 Begin loading supplies for Construction at MW-10D
0717 Well casing lengths
9.98', 9.99', 9.98', 9.99', 9.98', 9.99'
Screen 10.00'
Cap .23'
WL: ~10 ft bgs
726 Add 6" sand cushion 75ft
0736 begin installing MW-10D
Centralizers at: 64, 54, 44, 34, 24, 14, 4
0756 Add sand filter pack to 63ft bgs
0818 Filter pack at 63ft bgs
16 bags total
0819 Begin adding bentonite pellets
0848 Bentonite at 3ft bgs 17.5 buckets
0852 Begin clean up & tear down.
0900 Cascade gathers supplies to do Completion on MW-111 and bollards on MW-113, 114, 112, 111

1/11/22 J. Frashure

0924 move to MW-112 & setup for slug test

1016 Start slug test.

1018 WL returns to static before able to take measurement will repeat test multiple times for ~~transducer data~~ transducer data

1045 Finish slug testing

1100 Working on completion of MW-111

1150 Work on mw-112 completion

200 lunch

~~280~~ 1280 Continue on MW-112

1300 Move to MW-10D and begin working on completion

1450 MW-111 WL: 79.80 ft TD: 98.31 ft

1500 MW-112 WL: 17.49 ft TD: 54.01 ft

1510 MW-105R WL: 9.00 ft TD: 37.88 ft

* Cascade move to MW-113 for bollards

1525 MW-113 WL: 22.55 ft TD: 57.96 ft

* Cascade move to MW-114 for bollards

1613 MW-114 WL: 13.48 ft TD: 57.55 ft

1645 All personnel offsite

1/11/22

1/12/22 J. Frashure

Date: Wednesday January 12, 2022

Weather:

Personnel: Josh Rinehart

Task: Develop Wells, sampling

0630 All personnel onsite

0635 morning safety meeting

0640 prep to develop MW-10D

0647 WL: 12.76 ft TD: 76.95

Beg. Development

	pH	cond	Temp	turb	
0707	7.02	—	9.2	N/A	Brown
0709	6.90	—	11	N/A	Light Brown
0712	6.77	—	14.3	42	Surge
0717	6.85	—	12.8	N/A	Brown
0714	6.82	—	11.3	N/A	Light brown
0721	6.84	—	12.2	27	Surge
0724	6.83	—	12.3	N/A	Brown
0726	6.81	—	11.8	N/A	Cloudy Brown
0728	6.81	—	12.5	48.4	
0731	6.80	—	12.8	25.6	

0746 Finish Development ~ 55 gallons total no draw down

0830 Surveyor on site

Rite in the Rain

1/12/22 J. Fraser

1120 begin development on MW-111 with bailer WL: 79.~~95~~ H

	pH	Turb	Temp	
1122	6.96	N/A	18.3	Cloudy light brown
1131	6.80	N/A	15.5	" " "
1150	6.74	N/A	15.9	" " "
1158	6.74	N/A	15.8	" " "
1206	6.75	N/A	16.1	" " "
1217	6.73	N/A	17.9	" " "
1223	6.76	N/A	18.3	Clear up Some "Chunks"
1227	6.71	104.0	16.6	" " "

1228 Complete development ~30 gallons

1234 Set up for slug test on MW-111
start WL: 79.73 Cascade offsite

1440 Finish slug test
MW-111 WL: 79.75 Tag # 8007-8615

1450 MW-112 WL: 17.47 Tag # 8007-8614

1510 MW-10D WL: 12.73 Tag # 8007 8616

1512 setup for slug test

1515 Start slug test

1517 MW-10 WL: 12.70

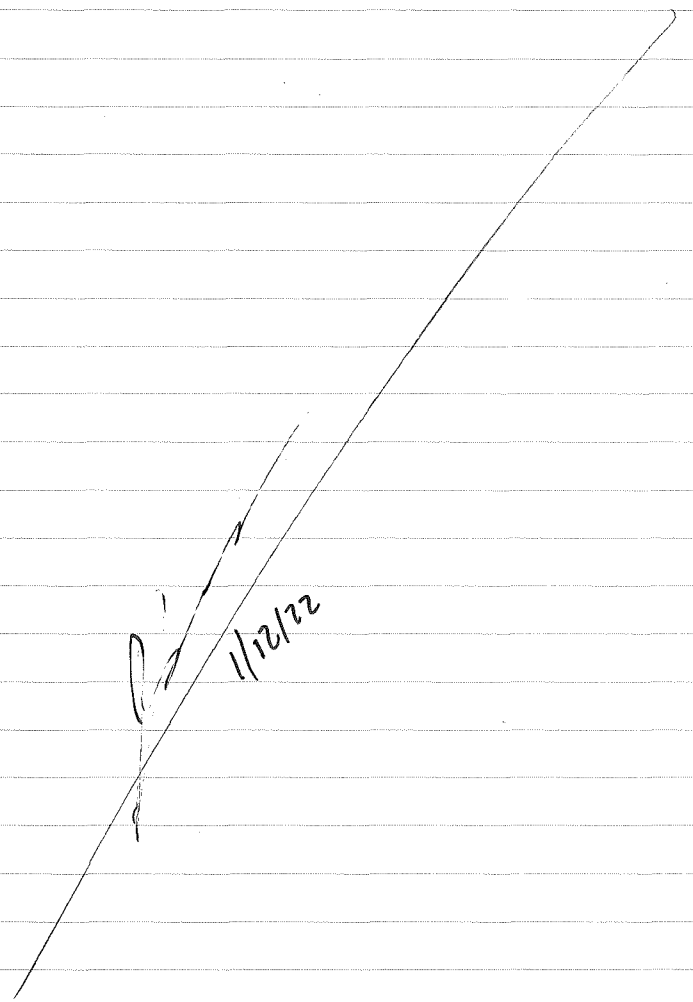
1534 Collect mine spoil Composite
[IDW-1]

1600 Finish Slug test

1/12/22

1610 Collect MW-10D mine Spoils
IDW-2

1630 BMcD offsite



Rite in the Rain

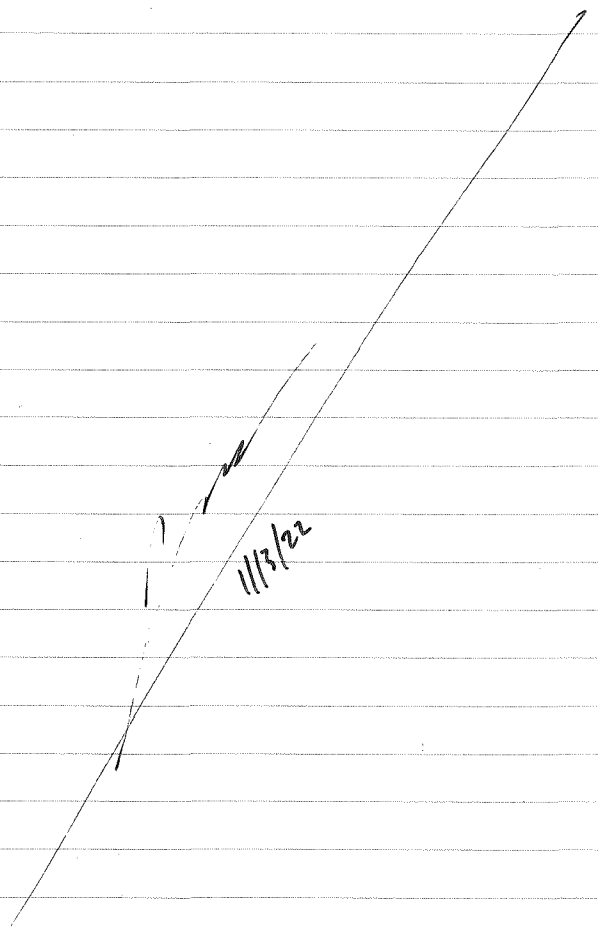
1/13/22 J. Frasher

Date: Thursday January 13th, 2022
Weather: 38-48, partly sunny, WNW 5-10
Task: Water level gauging
personnel: Josh Frasher
0730 Arrive on site
0745 Begin gathering Water levels

	Well ID	WL	
0745	MW-105R	8.36	8007-1175
0751	MW-110	8.34	
0755	MW-113	21.95	8007-1174
0915	MW-104	5.97	
0920	MW-114	12.89	8007-8613
0800	MW-7	39.07	
0804	MW-6	42.45	
0808	MW-5	58.40	
0812	MW-8	46.04	
0816	MW-1	17.89	
0836	MW-2	17.88	
0832	MW-3	23.02	
0841	MW-4	21.79	
0842	MW-4D	22.95	
0924	MW-102	10.58	

0855 Collect IDW sample from frac tank A2527C
IDW Water

1/13/22 J. Frasher
0940 off site



Rite in the Rain

APPENDIX F – DRILL LOGS

Drilling Log

Project Name: Big Rivers Wilson GWAP	Project Number:	Boring Number: MW-105R
Ground Elevation:	Location: Big Rivers Wilson Station	Page: 1 of 3
Air Monitoring Equipment:		Total Footage: 35' 4"

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic /Coring		12'	23' 4"	0	3

Drilling Company: Cascade	Driller(s):
Drilling Rig:	Type of Sampler:
Date: 12/7/21 To:	Field Observer(s): J. Frasher C. Hoglund

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Silt Some Sand (fine to very fine grained) Brownish yellow (10yr 6/8) non Plastic			7.5'/8'						1056 start
2										
3										
4	more Indurated (compacted)									
5										
6										
7	Silt, some Sand (fine to very fine) trace to Some clay, micaceous, more Indurated. very stiff, reddish yellow (7.5yr 6/8)									
8					1220					
9	weathered sandstone, fine grained Sand, Iron staining, quartz, mica yellowish red (5yr 5/8)			5ft/4ft			Drilling became harder			
10	mostly loose weathered sandstone with some competent beds interlayed									
11										
12	Hard Sandstone Iron Stained sandstone cobbles				1240		Switch to Coring			
13	Transition to competent sand stone layer Iron staining top 3 in						30 - 35° Bedding			
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

051601 Form WCD-2-1

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Drilling Log Continuation

Boring Number MW-105R
Project Name BREC Wilson GWAP
Page 2 of 3
Project Number
Date 12/7/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	Sandstone (fine to medium grain) light gray 7/) very hard competent Sand stone			3.5ft / 5.0ft			RQD 26/42 = 62%			
16							2 mechanized fractures near 15 - 16ft			
17		—	—	—	1520		Stop for day Start 12/8/21 0705			
18	Same as above: light olive gray to olive gray (5y 6/2 - 5/2) Some Iron staining/streaks more feldspar Rich			4.5ft / 5.0ft			RQD 100%			trace to some natural fractures
19										
20										
21	Partially healed natural fracture, Some Iron staining. Color returns to light gray (7y(). Quartz Rich				0715					
22		—	—	—	~~0715~~		21.5 - 25ft			
23	Same as above. little to no Iron staining. Quartz Rich				3.5ft / 3.5ft		RQD 100%			
24	few organic Interlays/lenses									
25					0745					
26	Same as above. Some Black Organic laminations throughout Trace Pyrite Weaker zone, more free sand prominent				5.0' / 5.0'		RQD 45.75/60 = 76%			
27							10 - 15° Bedding Planes			
28										
29										
30					0820					
31										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log Continuation

	Boring Number MW-105R
Project Name BREC Wilson GWAP	Page 3 of 3
Project Number	Date 12/8/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32	Same as above			3.5'/3.75'			RQD 35.5/43 = 83%			
33	Soft sediment mineralization Pyrite				0840					
34	Transition from SS to Shale. Wavy lenticular bedding, some lenses, Black organic layers			1.75'/2.0'			RQD 4.25"/21" = 20%			
35	Shale, dark grey, ~~soft~~ medium stiff to hard, Dense				0900		TD 35' 4"			
36										
37										
38										
39										
40										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log

Project Name: BREC Wilson GWAP	Project Number:	Boring Number: MW-111
Ground Elevation:	Location: BREC Wilson Station	Page: 1 of 7
Air Monitoring Equipment:		Total Footage: 105 ft

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic		95ft	10ft 95ft	0	0

Drilling Company: Cascade	Driller(s): Jason Green
Drilling Rig:	Type of Sampler: N/A
Date: 1/6/22 To: 1/7/22	Field Observer(s): Josh Fraser

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Very dark gray (2.5y 3/1) silt, Shale Cobbles, not stiff, non plastic			5'/5'						
2	Sand some Clay (fine sand), Shale Chunks some gravel light-yellowish brown (10y 6/4) not stiff, non plastic									
3										
4										
5	Course gravel, gray				1338					
6	mottled clay, brownish yellow (10yr 6/6) light-gray (10yr 7/2) stiff, some gravel / sandstone cobbles, plastic			5'/5'						
7										
8	Some silt, some Clay, Some weathered Shale, Black (10yr 2/1) multiple fossil chunks of shale mixed with Clay and silt, non plastic									
9										
10					1342					
11	Same as above			10'/10'						
12										
13	weathered Shale, Some inbedded layers, mostly broken up. TD 14									
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Project Name	BREC Wilson GWAP
Project Number	
Boring Number	MW-113
Page	2 of 7
Date	1/6/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	Same as above									
16										
17										
18										
19										
20					1355					
21	Same as above, less intact layers, more gravel sized pieces									
22										
23				7/10'						
24										
25	Weathered Sandstone, some intact layers mostly broken up from Sand, Iron Staining									
26										
27										
28										
29	mottled Clay some silt lenses in some sand (Fine grain) brownish yellow (10yr 6/6) medium Plasticity medium Stiff									
30					1420					
31										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Project Name	BREC Wilson GWAP
Project Number	
Boring Number	MW-111
Page	3 of 7
Date	1/6/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32	Same as above more shale present									
33										
34	Sand, fine grained, yellow (10yr 8/6)									
35				10'/10'						
36	Clay with sand (fine) brownish yellow (10yr 6/8), some plasticity stiff, trace to some gravel, some iron staining									
37										
38										
39										
40	Broken up weathered shale				1430					
41										
42	Broken up sandstone highly weathered									
43	Weathered shale broken up PRY									
44				9'/10'						
45										
46										
47										
48	weathered broken up sandstone									
49					1445					

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log Continuation

	Boring Number MW-111
Project Name BREC Wilson GWAP	Page 4 of 7
Project Number	Date 1/6/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
50	Weathered Shale, broken up Wet from Drilling water									
51										
52	Weathered broken up sandstone some Inbedded layers, some Iron Staining									
53										
54	Weathered broken up Shale DRY			8'/10'						
55										
56										
57										
58	Broken up weathered Sand Stone									
59										
60					1500					
61	Same as above									
62										
63				0'/10'						
64										
65	Weathered Shale, broken up from inbedded layers									
66										
67	Weathered Sandstone, very broke up, Iron Staining throughout									

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log Continuation

Project Name	BREC Wilson GWAP
Project Number	
Boring Number	MW-111
Page	5 of 7
Date	1/6/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
68										
69										
	Shale weathered, Black				1520					
70										
71										
	Interbedded shale / sandstone weathered,									
72										
73	Broken up weathered shale Some indurated layers									
				7/10'						
74										
75										
76										
77										
78										
79	Sandstone / shale interbedded (weathered)									
					1535					
80	Sandstone highly weathered some shale interbedded no hard layers									
81										
	becomes more indurated no shale			5.0'/5.0'						
82	-									
	weathered layers of sandstone, densly packed sand some to trace clay									
83										
	-									
84										
					1555					
85										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

010515 Form WCD-KC-2-2

Drilling Log Continuation

Project Name	BREC Wilson GWAP
Project Number	
Boring Number	MW-111
Page	6 of 7
Date	1/6/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
86	Weathered Sandstone Some Indurated layers									
87										
88				5.0/5.0						
89										
90					1620					
	Sand, Some gravel (fine sand, Course gravel) Sandstone gravel						1/7/22	Begin Sonic 0900		
91										
92										
93				5.0/7.0						
94	light gray broken up Shale, weathered									
95										
96										Shale Bedrock encountered more competent bedrock Indurated layers
97					0920					
98	Same as above, more Indurated layers horizontal bedding medium to dark grey									
99										
100										
101										
102										
103										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

	Boring Number MW-111
Project Name BREC Wilson Station	Page 7 of 7
Project Number	Date 1/7/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
104	Same as above				1015					
105							TD 105Ft bgs		1015	

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log

Project Name	Project Number	Boring Number
BREC Wilson GWAP		MW-112
Ground Elevation	**Location**	**Page**
	BREC Wilson Station	1 of 4
Air Monitoring Equipment		**Total Footage**
		56 ft

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic/PA		51 ft	5 ft	6	6

Drilling Company Cascade	**Driller(s)** Jason Brewer
Drilling Rig	**Type of Sampler** N/A
Date 12/22/21 **To** 1/3/22	**Field Observer(s)** Josh Fraher

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Silt with clay, gravel (course gravel) dark brown (10 yr 3/3) medium to high Plasticity, medium SI-If						Start time 1000			
2	Same as above, trace gravel (fine to course) trace iron staining throughout		5.0 / 10.0							
3										
4										
5										
6										
7										
8										
9										
10					1015					
10	Same as above									
11			5.0 / 10.6							
12	transition to more gravel									
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL

Drilling Log Continuation

Project Name BREC Wilson GWAP	Boring Number MW-112
Project Number	Page 2 of 4
	Date 12/22/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
	transition to more gravel									
15	Silt, Some clay, trace to some fine sand. Some gravel / course very dark brown (10yr 2/2) non plastic St. ff.									
16										
17										
18										
19										
20	Highly weathered sandstone. Iron staining throughout. Alternating between indurated layers and loose sand layers				1027					
21										75 Additional gallons grout used with no increase in level. Verbal Approval to use Chip for remainder
22				2.0/4.0						Verbal Approval from state to use Bentonite chip to fill void. level at Chip 22ft
23										
24					1035					Hard Rock at 24ft bgs stop for day
	Highly weathered Sandstone, Iron staining throughout. multiple mechanical fractures Quartz and mica rich.									Begin pa on 1/3/22 at 1117
25				2.0/2.0	Run1		RQD = 11/24 = 46%			
26					1154					Top at Grout 200 gallons used to reach this depth
27	limestone, light grey dense small inclusions									
28	Black Shale. Clay rich, dense			2.0/5.0	Run2		RQD: 0/24 = 0%			
29							lots of void spaces			
	weathered Iron Stained sandstone						Poor recovery			
30							lots of sand in cuttings			
31					1220					

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

010515 Form WCD-KC-2-2

Drilling Log Continuation

Project Name: BREC Wilson GWAPP
Project Number:
Boring Number: MW-112
Page: 3 of 4
Date: 1/3/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32							32ft	Top of Bentonite pellets		
33	Mine Spoils (sandstone, shale, some coal, sand to cobble size)			3.0 / 5.0	Run3		RQD%			
34										
35										
36					1240					
37	Same as above Very low to no Recovery			.5 / 5.0	Run4		RQD: 0%			
38										
39										
40									Top of Filter Pack	
41					1300					
42	Same as above Very low to no Recovery									
43				.5 / 5.0	Run5		RQD: 0%			
44										
45										
46					1400					
47	Same as above			2.5 / 5.0	Run6		RQD 10/30 : 33%			
48										
49					1425					

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

	Boring Number MW-112
Project Name BREC Wilson GWAP	Page 4 of 4
Project Number	Date 1/3/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
50										
51	Shale, Black, dense									
52				2.5/3.0		RGD:	10/30:	33%		
53										
54					Run 7 1442					
	Same as above									
55				2.0/2.0	Run 8 1400	RGD	5/24:			
56										
57										
58										
59										
60										
61										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log

Project Name: BREC Wilson GWAP	Project Number:	Boring Number: MW-113	
Ground Elevation:	Location: BREC Wilson Station	Page: 1 of 6	
Air Monitoring Equipment:		Total Footage: 94ft	

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic/PC		24.5	69.5ft	N/A	8

Drilling Company: Cascade		Driller(s):	
Drilling Rig:		Type of Sampler: N/A	
Date: 12/9/21	To: 12/11/21	Field Observer(s): Josh Fraser	

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
0	Clay some silt, yellowish brown (10yr 5/6) medium plasticity, medium stiffness						Start 1401			
1										
2										
3	Same as above, light gray inclusions or mottling, trace sand (fine to course)			8.75ft/10ft						
4										
5										
6										
7										
8	Same as above, light-gray inclusions/mottling brownish yellow (10yr 6/8)									
9										
10					1404		Stop for day @10ft bgs			
	Clay, trace to some silt, trace sand (Fine grain) yellow brown (10yr 5/6) medium to high plasticity, medium stiff		5'8"/5ft				Start 0737 12/10/21			
11										
12										
13	Same as above, trace gravel (fine to course)									
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

051601 Form WCD-2-1

BURNS McDONNELL

Drilling Log Continuation

Project Name: BREC Wilson GWAP
Project Number:
Boring Number: MW-113
Page: 2 of 6
Date: 12/10/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
	Silt, trace clay, trace sand, Indurated (Compact) yellow (2.5y 7/8)									
15	Clay, some to trace silt, ~~slight~~ mottling, medium stiff medium to high plasticity yellowish brown (10yr 5/4)				0745					
16	Silt, ~~Broken up but hard pieces Indurated, Fissile layers~~, wavy bedding very hard, pale brown (2.5y 7/4)									
	layers become more apparent toward bottom of run									
17	more indurated, wavy bedding more Prominent		4.25'→ 5.0'							
18										
19										
20					0800					
21	Weathered Sandstone (fine grained) yellow (2.5y 7/8)									
22	Same as above olive brown (2.5y 4/4)		4.5→ 4.5							
	Same as above yellow (7.5y 7/8)									
23	weathered sandstone (very fine grained) trace silt light gray (5y 7/2)									
24	Same as above yellow (7.5y 7/8)				0835		Change to Coring			
25	Indurated weathered sandstone light gray (5y 7/1) iron staining through out multiple fractures.						RQD: 25"/54" = 46%			
26	-fine grained - ~~granite~~ ~~porphyroblasts~~ mica/quartz rich		4.5→ 4.5		Run1					
27										
28										
29					0910					
30										
31										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

010515 Form WCD-KC-2-2

Drilling Log Continuation

Boring Number MW-113
Project Name BREC Wilson GWAP
Page 3 of 6
Project Number
Date 12/10/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32	Same as above, more iron staining than previous section, more mechanical fractures			2.5ft / 5.0ft	Run2		RQD=0%			
33					0930					
34	light gray to grey (5y 7/1-6/1) quartz rich sand stone, fine grained.									
35	mica rich top foot is broken up some mechanical fractures						RQD: 78%			
36				4.5' / 5.0'	Run3					
37										
38										
39	Same as above, wavy bedding some mechanical fractures				1005 Run4		Change to PQ coring Start PQ 1308			
40				2.5 / 2.5			RQD: 18.5/36 = 62%			
41	Same as above; gray (5y 6/1)				1325					Possible natural fracture vertical
42	Same as above some organic laminations wavy bedding				Run5					
43										
44										
45				5' / 5'			RQD: 52"/60" = 87%			
46	two healed fractures with some mineralization				1345		41.5-46.5			
47	Same as above									
48	Concoidal fractures, healed, Pyrite mineralization						RQD: 39.5/60 = 67%			
49										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL

Drilling Log Continuation

Project Name: BREC Wilson GWAP
Project Number:
Boring Number: MW-113
Page: 4 of 6
Date: 12/10/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
50										
51	thick lenses pyrite inclusions / organic inclusion			5.0/5.0	1405		Possible natural fracture			around 51ft
52	highly fractured zone, organic laminae									high fracture zone
53	Sandstone, gray (5y 6/1), Quartz, micah Pyrite grains, fine grained well sorted			5.0/5.0	Run7		RQD: 54/60 = 90%			
54										
55										
56					1430					
57	Same as above, few fractured zones that could be natural									
58							RQD: 57.5/60 = 96%			natural? → = → =
59				5.0/5.0	Run8					
60										
61					1505					
62	Same as above, fractured zones have mineralization / organics in them									
63	multiple laminae of organics possible natural fractures.			5.0'/5.0'	Run9		RQD: 53/60 = 88%			
64										
65	multiple laminae of organics									
66					1526					
67										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Boring Number MW-113
Project Name BREC Wilson GWAP
Page 5 of 6
Project Number
Date 12/10/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
68	Same as above									
69	Organic laminae, some natural fracture			5.0/5.0	Run 10		ZQD:	58/60 = 97%		natural fracture? → = → = → =
70										
71					1540					
72	Some as above						Start 12/11/21 0716			
73	*highfracture zone, mechanical			5.0/5.0	Run 11		ZQD: 36/60 = 60%			
74										
75										
76					0740					
77										
78	Some as above			5.0/5.0	Run 12		ZQD: 100%			
79										
80										
81					0800					
82	Some as above									
83				5.0/5.0	Run 13		ZQD: 100%			
84										
85										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

Drilling Log Continuation

Boring Number MW-113
Project Name BREC Wilson GWAP
Page 6 of 6
Project Number
Date 12/11/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
86					830					
87										
88										
89	Same as above			5.0/5.0	Run 14		RQD: 100%			
90										
91										
92	Shale black, very hard				0900					
93				2.5/2.5			RQD: 27/30 = 90%			
94					0946		TD: 94ft			
95										
96										
97										
98										
99										
100										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log

Project Name: BREC Wilson GWAP	Project Number:	Boring Number: MW-114
Ground Elevation:	Location: BREC Wilson Station	Page: 1 of 4
Air Monitoring Equipment:		Total Footage: 56

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic/PQ		11 Ft	48 Ft	N/A	N/A

Drilling Company: Cascade	Driller(s): Russ Gordon / Jason Grair
Drilling Rig:	Type of Sampler: N/A
Date: 12/13/21 To: 12/20/21	Field Observer(s): Josh Frasher

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Silt top soil, medium stiff, low plasticity Black/ gray 3/8" gravel chips						Start: 0705			
2	Silt, trace to some sand (very fine to fine) trace to some clay, yellowish brown (10yr 5/8) low plasticity, stiff			5'/4'						
3	transitions to higher sand content as moving downward									
4										
5										
6										
7										
8	Iron staining present trace gravel				0710					
9	Clay some sand (fine), trace gravel (fine to coarse, well graded) yellowish brown (10yr 5/6) medium to high plasticity, medium stiff			2'/2'						
10	weathered sandstone layers of hard sandstone and broken up sandstone iron staining throughout, fine grained									
11					0720		Install outer casing switch to PQ			
12	weathered sandstone quartz rich some mica, becomes more indurated deeper, light yellowish brown (2.5y 6/4) iron staining throughout			3.5/5.0	Run1		1003 Begin PQ coring RQD 22.5/42 = 54%			multiple natural fractures
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL

Drilling Log Continuation

Project Name	BREC Wilson Station GWAP
Project Number	
Boring Number	MW-114
Page	2 of 4
Date	12/13/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15										
16					1025					
17	Sandstone quartz arenite fine grained light grey to grey (5y 7/1 - 6/1) mechanical fractures throughout			5.6/5.0	Run2		RQD: 23.5/60 =			
18										
19										
20										
21	some Iron staining				1054					
22	Same as above mechanical fracturing throughout Slightly higher mica percentage/content			4.5/5.0	Run3		RQD: 33.5/54 = 62%			
23	Some Iron staining									
24	healed fracture									
25										
26					1120					
27	Same as above, some lighter bedding Plainness. Some fractured zones that have healed.			2.0/5.0	Run4		RQD: 19/24 = 79%			
28										
29										
30										
31					1205					

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Boring Number MW-114
Project Name BREC Wilson GWAP
Page 3 of 4
Project Number
Date 12/13/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32	Same as above, weaker cementation (able to break by hand)									
33	Sandstone hardens again			3.0/5.0	Run5		RQD: 21.5/36 = 79%			
34	~~Some Dark staining~~ Jr									
35	Some Dark Staining									
36					1325					
37										
38	Highly fractured zone vertical & Horizontal healed fracture with some Iron staining Same as above			5.0/5.0	Run6		RQD: 48/60 = 80%			Poorly cemented
39										
40										
41	Poorly cemented/gritty				1415		Stop for day			
							Begin Coring 1120 12/20/21			
42	~~Same~~ as above (grey sandstone) Some organic laminae.			4.5/5.0	Run7		RQD: 100%			
43										
44										
45	healed natural fracture, Horizontal									
46					1140					
47	Same as above			4.5/5.0	Run8		RQD: 13.5/54 = 25%			
48										
49										

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

	Boring Number MW-114
Project Name BREC Wilson GWAP	Page 4 of 4
Project Number	Date 12/20/21

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
50										
51					1202					
51	Black clay rich shale.									
52										
53	Highly fractured zone, Organic laminae			5.0/5.0	Run1		RQD: 40/60 =		66%	
54										
55										
56										
57					1257		TD: 56ft ~~57ft~~ BGS			
58										
59										
60										

Drilling Log

Project Name: BREC Wilson GWAP	Project Number	Boring Number: MW-10D
Ground Elevation	Location: BREC Wilson Station	Page: 1 of 5
Air Monitoring Equipment		Total Footage: 57

Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. of Samples	No. of Core Boxes
Sonic		7 Ft		0	0

Drilling Company: Cascade	Driller(s): Jason Greer
Drilling Rig	Type of Sampler
Date: 1/10/22 To: 1/10/22	Field Observer(s): Josh Frasher

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
1	Sand some to trace clay (fine sand) shale chunks (gravel sized) yellowish brown (10yr 5/8) loose			4' 5'			1108 start Well in mine spoils Alternates from Sand, sandstone, shale and clay			
2										
3	transition to weathered shale some sand layers, very soft gray (10yr 6/1)									
4										
5	Clay with sand, soft yellowish brown (10yr 5/8) some gravel				1110					
6	weathered gray shale									
7	Clay with sand, yellowish brown (10yr 5/8) some gravel			4' 5'						
8										
9										
10					1115					
11	Sand, trace to some clay (fine sand) shale gravel yellowish brown (10yr 5/8) loose									
12							Thin layer of shale only			
13										
14										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL

Drilling Log Continuation

Boring Number MW-10D
Project Name BREC Wilson CWA55
Page 2 of 5
Project Number
Date 1/10/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
15	Same as above									
16				6'/10'						
17										
18										
19										
20					1128					
	Same as above less gravel & clay mostly sand & weathered shale									
21										
22							bottom up shale layer			
23										
24				4'/10'						
25										
26										
27										
28										
29										
30					1135					
31										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

010515 Form WCD-KC-2-2

Drilling Log Continuation

Project Name	BREC Wilson GWAT
Project Number	
Boring Number	MW-10D
Page	3 of 5
Date	1/10/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
32										
33	Same as above more gravel sized pieces of sandstone & Shale.									
34				8'						
35				10'						
36										
37										
38										
39										
40					1142					
41	Grey Sandstone broken up. Quartz & minor Rock									
42										
43				8'						
44				10'						
45										
46										
47	Sand mixed to some Clay (fine sand) yellowish brown (10yr 5/8) loose some Shale pieces									
48										
49										
50					1153					

BZ=Breathing Zone BH=Bore Hole S=Sample

Drilling Log Continuation

Project Name: BREC Wilson	Boring Number: MW-10D
Project Number:	Page: 2 of 5
	Date: 1/10/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
50										
51	Sameas above more gray Sand & Sandstone gravel									
52										
53										
54				3'/10'						
55										
56										
57										
58										
59										
60					1245					
	Same as above									
61										
62										
63				5'/10						
64										
65										
66										
67	Patch of weathered broken gray Sandstone									

Drilling Log Continuation

Project Name	BREC Wilson GWAP
Project Number	
Boring Number	MW-10D
Page	5 of 5
Date	1/10/22

Depth (feet)	Description	Class	Blow Count	Recov.	Run/ Time	Sample Desig.	PID (ppm) BZ	PID (ppm) BH	PID (ppm) S	Remarks/ Water Levels
69	Clay with sand (firm), dusky yellowish brown (10yr 4/4) stiff. medium to low plasticity				1302					
70										
71	Same as above									
72				7'/7'						
73										
74	Shale, light gray dense, more indurated layers									
75										
76										
77					1317			TD: 77ft		
78										
79										
80										
81										
82										
83										
84										
85										

BZ=Breathing Zone BH=Bore Hole S=Sample

BURNS McDONNELL.

010515 Form WCD-KC-2-2

APPENDIX G – KENTUCKY MONITORING WELL VARIANCE REQUESTS

KENTUCKY MONITORING WELL VARIANCE REQUEST

Pursuant to 401 KAR 6:350 Section 1

Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, 3rd floor, Frankfort, KY 40601 502-564-3410

GENERAL INFORMATION

Requested By: Jason Greer

Received By:

Driller Certification Number: 0492 - 0608 -00

Date of Request: 1/7/2022

Drilling Company: Cascade Drilling

Time of Request: 15:15

WELL OWNER IDENTIFICATION

Well Owner: Big Rivers Elec. Corp.

Telephone: 270 - 827 - 2561

Address: 5663 St. Rt. 85W

Email: Travis.Sneed@bigrivers.com

City, State: Centertown, KY

Zip Code: 42328

REASON FOR VARIANCE

Attach All Supporting Documentation, 401KAR 6:350 Section 1(6)(a)

See Attached

☐ Blanket Variance for monitoring well installed in <30 ft. unconsolidated materials

Applicable Regulation: 401 KAR 6:350

Section: 3 (1) (a)

WELL LOCATION

Quadrangle: Equality, KY

Code:

County: Ohio

Code:

AI Number: 3319

AKGWA Number: 8007 - 8615

Latitude (dd): N 37.458315 °

Longitude: W -87.09736 °

EFFECTIVE DATES

Well Construction Date: 1/8/22

Well Must be Completed On or Before:

WELL CHARACTERISTICS

		Estimated	Exact
Soil Thickness:	ft.		
Depth to Bedrock: 96	ft.	☐	☒
Mine Spoils Water-Bearing Units: 0	ft.	☐	☒

Type of Bedrock: Shale

WELL CONSTRUCTION OR ABANDONMENT REQUIREMENTS

☐ The Division of Water is issuing you a onetime temporary water well variance as a certified monitoring well driller to plug a water well located at the following location:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well construction variance due to shallow water zone to be monitored at this site. This monitoring well construction variance is for approval of the shorter interval of the sand/filter packs and bentonite seals installed at:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well (construction or abandonment) variance due to

This variance is for approval of: using bentonite pellets for entire annular seal instead of high solids bentonite grout

For wells installed at: Wilson Landfill

Please include a copy of this variance request with the plugging record you submit.

CASING AND SCREEN INFORMATION

From: NA	To:	Hole Diameter: NA	in.	Outer Casing Diameter: NA	in. Material:
From: +3.00 ft	To: 86.00 ft	Hole Diameter: 6	in.	Inner Casing Diameter: 2	in. Material: Sch. 40 PVC
From: 86.00 ft	To: 96.00 ft	Hole Diameter: 6	in.	Screen Diameter: 2	in. Material: Sch. 40 PVC

SEALING MATERIAL REQUIREMENTS FOR PLUGGING

Sealing Material Type: 3/8in Bentonite Pellets

From: 3.00 ft	To: 84.00 ft	Method: Bentonite pellets
From:	To:	Method:

ADDITIONAL REQUIREMENTS

Sketch Map must be provided:

See Attached

THIS VARIANCE IS NOT VALID UNLESS SIGNED BY THE CERTIFIED MONITORING WELL DRILLER AND THE WELL OWNER

DRILLER AFFIRMATION

I, the undersigned, agree to construct the above described well in accordance with all water well construction practices and standards established by the Kentucky Energy and Environment Cabinet, Department of Environmental Protection and in accordance with those conditions described in this variance request. I will be held financially responsible for remedial measures for this well if I fail to construct the well in compliance with the conditions established in this variance request.

Signature:

Date: 1/19/22

DIVISION OF WATER AFFIRMATION

Signature:

Date:

WELL OWNER AFFIRMATION

I, the undersigned, understand the above described well is not in compliance with the water well construction practices and standards established by the Kentucky Energy and Environment Cabinet. I acknowledge that the driller has requested a variance to allow the well to be constructed according to the conditions described in this variance request. By signing below, I give my permission for the well to be constructed as described above. If this variance well is constructed to the specifications of this variance and results in degradation of groundwater quality, I will be financially responsible for remedial measures for this well, including plugging if necessary.

Signature:

1-20-22

Date:

VARIANCE REQUEST SUPPLEMENTAL INFORMATION
Big Rivers Electric Corporation D.B. Wilson Station
Monitoring Well MW-111 (AKGWA #: 8007-8615)

Location of MW-111 (AKGWA #: 8007-8615)



(Image Source: Google Earth, accessed January 17, 2022; image date 10/2020)

Monitoring Well MW-111 is located near the western property boundary of BREC D.B. Wilson Station, 0.50 miles north of Kentucky Route 85, and 0.32 miles east of Green River.

Monitoring Well MW-111 was drilled 95 feet through suspected mine spoils where shale was encountered. The well screen was placed from 86.00 – 96.00 ft bgs. The depth to groundwater at MW-111 was 77 ft bgs.

Reason For Variance:

Based on previous well construction experience from installing new monitoring well MW-112 completed in suspected mine spoils where a separate emergency variance request was verbally approved because the annular seal could not be constructed using high-solids bentonite grout slurry due to loss of slurry into void(s) in the mine spoils, an emergency variance was requested for subsequent remaining new monitoring wells MW-111 and MW-10D to be drilled/installed where mine spoils were encountered.

Verbal approval was given by the Kentucky Department of Waste Management (KDWM) for an emergency variance to use bentonite pellets as the annular seal. At MW-111 bentonite pellets were emplaced by slowly pouring the bentonite pellets from the bucket into the borehole and allowed to gravity fall around the annular space of the well to 3-feet bgs (3-84ft bgs). During placement of the bentonite pellets, the depth to top of bentonite pellets was continuously checked/monitored with a tape measure to verify bridging of the bentonite was not taking place. Once the top of bentonite pellets were above the water table, approximately 5 gallons of water were added for every one-half (1/2) bucket of pellets.

VARIANCE REQUEST SUPPLEMENTAL INFORMATION
Big Rivers Electric Corporation D.B. Wilson Station
Monitoring Well MW-111 (AKGWA #: 8007-8615)

The field conditions encountered and approved variance well construction procedures performed as described above are documented in the attached well construction diagram form for MW-111. The ground surface, top of casing, and bottom of boring elevations will be surveyed and included in a separate monitoring well installation report.

KENTUCKY MONITORING WELL VARIANCE REQUEST

Pursuant to 401 KAR 6:350 Section 1

Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, 3rd floor, Frankfort, KY 40601 502-564-3410

GENERAL INFORMATION

Requested By: Jason Greer
Received By:
Driller Certification Number: 0492-0608-00
Date of Request: 1/5/2022
Drilling Company: Cascade Drilling
Time of Request: 16:00

WELL OWNER IDENTIFICATION

Well Owner: Big Rivers Elec. Corp.
Telephone: 270 - 827 - 2561
Address: 5663 St. Rt. 85W
Email: Travis.Sneed@bigrivers.com
City, State: Centertown, KY
Zip Code: 42328

REASON FOR VARIANCE

Attach All Supporting Documentation, 401KAR 6:350 Section 1(6)(a)

See Attached

☐ Blanket Variance for monitoring well installed in <30 ft. unconsolidated materials

Applicable Regulation: 401 KAR 6:350
Section: 3 (1) (a)

WELL LOCATION

Quadrangle: Equality, KY
Code:
County: Ohio
Code:
AI Number: 3319
AKGWA Number: 8007-8614
Latitude (dd): N37.4560328
Longitude: W--87.0990786

EFFECTIVE DATES

Well Construction Date: 1/4/2022
Well Must be Completed On or Before:

WELL CHARACTERISTICS

			Estimated	Exact
Soil Thickness:		ft.		
Depth to Bedrock:	51	ft.	☐	☒
Mine Spoils Water-Bearing Units:	15	ft.	☐	☒
Type of Bedrock:	Shale			

WELL CONSTRUCTION OR ABANDONMENT REQUIREMENTS

☐ The Division of Water is issuing you a onetime temporary water well variance as a certified monitoring well driller to plug a water well located at the following location:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well construction variance due to shallow water zone to be monitored at this site. This monitoring well construction variance is for approval of the shorter interval of the sand/filter packs and bentonite seals installed at:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well (construction or abandonment) variance due to

This variance is for approval of: using bentonite chips in portion of annular seal instead of high solids bentonite grout

For wells installed at: Wilson Landfill

Please include a copy of this variance request with the plugging record you submit.

CASING AND SCREEN INFORMATION

From: NA To:	Hole Diameter:	NA	in.	Outer Casing Diameter:	NA	in. Material:
From: +3.0 ft To: 42.00 ft	Hole Diameter:	6	in.	Inner Casing Diameter:	2	in. Material: Sch. 40 PVC
From: 42.00 ft To: 52.00 ft	Hole Diameter:	6	in.	Screen Diameter:	2	in. Material: Sch. 40 PVC

SEALING MATERIAL REQUIREMENTS FOR PLUGGING

Sealing Material Type: Bentonite pellets, grout and chips

From: 3.00 ft To: 40.00 ft	Method: Bentonite pellets, grout, chips
From: To:	Method:

ADDITIONAL REQUIREMENTS

Sketch Map **must be provided:**

See Attached

THIS VARIANCE IS NOT VALID UNLESS SIGNED BY THE CERTIFIED MONITORING WELL DRILLER AND THE WELL OWNER

DRILLER AFFIRMATION

I, the undersigned, agree to construct the above described well in accordance with all water well construction practices and standards established by the Kentucky Energy and Environment Cabinet, Department of Environmental Protection and in accordance with those conditions described in this variance request. I will be held financially responsible for remedial measures for this well if I fail to construct the well in compliance with the conditions established in this variance request.

Signature: [signature] Date: 1/19/22

DIVISION OF WATER AFFIRMATION

Signature: Date:

WELL OWNER AFFIRMATION

I, the undersigned, understand the above described well is not in compliance with the water well construction practices and standards established by the Kentucky Energy and Environment Cabinet. I acknowledge that the driller has requested a variance to allow the well to be constructed according to the conditions described in this variance request. By signing below, I give my permission for the well to be constructed as described above. If this variance well is constructed to the specifications of this variance and results in degradation of groundwater quality, I will be financially responsible for remedial measures for this well, including plugging if necessary.

Signature: [signature] Date: 1-20-22

VARIANCE REQUEST SUPPLEMENTAL INFORMATION
Big Rivers Electric Corporation D.B. Wilson Station
Monitoring Well MW-112 (AKGWA #: 8007-8614)

Location of MW-112 (AKGWA Number: 8007-8614)



(Image Source: Google Earth, accessed January 6, 2022; image date 10/2020)

Monitoring Well MW-112 is located near the western property boundary of BREC D.B. Wilson Station, 0.3 miles north of Kentucky Route 85, and 0.26 miles east of Green River.

Monitoring Well MW-112 was drilled 51 feet through suspected mine spoils where shale was encountered. The well screen was placed from 42.00 – 52.00 ft bgs. The depth to groundwater at MW-112 was 15 ft bgs.

Reason For Variance:

While grouting the annular seal of MW-112 with high-solids bentonite grout, the grout level remained static at 26 ft bgs after emplacing 200 gallons of high-solids bentonite grout (grout slurry). This resulted in a 6-foot-thick annular seal (26-32 ft bgs) consisting of grout slurry above the bentonite seal. The loss of grout slurry in the annular space of the borehole was believed to be due to a void(s) encountered within the suspected mine spoils. After waiting 3 hours from emplacing 200 gallons of the grout slurry, bentonite chips were used in an attempt to gap the suspected void. The layer of bentonite chips is 4-foot-thick (22-26 ft bgs) and was allowed to hydrate for 4 hours. After bentonite chip hydration another attempt was made using grout slurry. Approximately 75 gallons of grout slurry was emplaced, but the grout level remained at 22 ft bgs.

Verbal approval was given by the Kentucky Department of Waste Management (KDWM) for an emergency variance to use medium bentonite chips (3/8-inch diameter) as the annular seal to create approximate 4-foot seal (22-26 ft bgs) above the top of the grout slurry and allowed to hydrate for 4 hours. The bentonite chips were emplaced by slowly pouring the bentonite chips from the bag into the borehole and allowed to gravity fall around the annular space of the well. During placement of the bentonite chips, the depth to top of bentonite chips was continuously checked/monitored with a tape measure to verify bridging of the bentonite was not taking place.

VARIANCE REQUEST SUPPLEMENTAL INFORMATION
Big Rivers Electric Corporation D.B. Wilson Station
Monitoring Well MW-112 (AKGWA #: 8007-8614)

Following the 4-hour hydration time, grout slurry was emplaced in the borehole to complete the annular seal. However, after emplacing 75gallons of grout slurry, the grout level remained static at 22 ft bgs.

Verbal approval was given by the KDWM for an emergency variance to use medium bentonite chips (3/8-inch diameter) as the annular seal to 3-feet bgs (3-22 ft bgs) and allowed to hydrate using the same field procedures as described above. Above the water level in the borehole, the bentonite chips were added and hydrated at one-half (1/2) a bag at a time.

The field conditions encountered and approved variance well construction procedures performed as described above are documented in the attached well construction diagram form for MW-112. The ground surface, top of casing, and bottom of boring elevations will be surveyed and included in a separate monitoring well installation report.

KENTUCKY MONITORING WELL VARIANCE REQUEST

Pursuant to 401 KAR 6:350 Section 1

Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, 3rd floor, Frankfort, KY 40601 502-564-3410

GENERAL INFORMATION

Requested By: Jason Greer

Received By:

Driller Certification Number: 0492-0608-00

Date of Request: 1/7/22

Drilling Company: Cascade Drilling

Time of Request: 15:15

WELL OWNER IDENTIFICATION

Well Owner: Big Rivers Elec. Corp.

Telephone: 270 - 827 - 2561

Address: 5663 St. Rt. 85W

Email: Travis.Sneed@bigrivers.com

City, State: Centertown, KY

Zip Code: 42328

REASON FOR VARIANCE

Attach All Supporting Documentation, 401KAR 6:350 Section 1(6)(a)

See Attached

☐ Blanket Variance for monitoring well installed in <30 ft. unconsolidated materials

Applicable Regulation: 401 KAR 6:350

Section: 3 (1) (a)

WELL LOCATION

Quadrangle: Equality, KY Code:

County: Ohio Code:

AI Number: 3319

AKGWA Number: 6007-8616

Latitude (dd): N 37.454901 ° Longitude: W -87.089898 °

EFFECTIVE DATES

Well Construction Date: 1/11/22

Well Must be Completed On or Before:

WELL CHARACTERISTICS

		Estimated	Exact
Soil Thickness:	ft.		
Depth to Bedrock: 77	ft.	☐	☒
Mine Spoils Water-Bearing Units: 0	ft.	☐	☒

Type of Bedrock: Shale

WELL CONSTRUCTION OR ABANDONMENT REQUIREMENTS

☐ The Division of Water is issuing you a onetime temporary water well variance as a certified monitoring well driller to plug a water well located at the following location:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well construction variance due to shallow water zone to be monitored at this site. This monitoring well construction variance is for approval of the shorter interval of the sand/filter packs and bentonite seals installed at:

Please include a copy of this variance request with the plugging record you submit.

☐ The Division of Water is issuing you a onetime temporary monitoring well (construction or abandonment) variance due to

This variance is for approval of: using bentonite pellets for entire annular seal instead of high solids bentonite grout

For wells installed at: Wilson Landfill

Please include a copy of this variance request with the plugging record you submit.

CASING AND SCREEN INFORMATION

From: NA To:	Hole Diameter: NA in.	Outer Casing Diameter: NA	in.	Material:	
From: +3.00 ft To: 65.00 ft	Hole Diameter: 6 in.	Inner Casing Diameter: 2	in.	Material:	Sch. 40 PVC
From: 65.00 ft To: 75.00 ft	Hole Diameter: 6 in.	Screen Diameter: 2	in.	Material:	Sch. 40 PVC

SEALING MATERIAL REQUIREMENTS FOR PLUGGING

Sealing Material Type: 3/8in Bentonite Pellets

From: 3.00 ft To: 63.00 ft	Method: bentonite pellets
From: To:	Method:

ADDITIONAL REQUIREMENTS

Sketch Map must be provided:

See Attached

THIS VARIANCE IS NOT VALID UNLESS SIGNED BY THE CERTIFIED MONITORING WELL DRILLER AND THE WELL OWNER

DRILLER AFFIRMATION

I, the undersigned, agree to construct the above described well in accordance with all water well construction practices and standards established by the Kentucky Energy and Environment Cabinet, Department of Environmental Protection and in accordance with those conditions described in this variance request. I will be held financially responsible for remedial measures for this well if I fail to construct the well in compliance with the conditions established in this variance request.

Signature: Date: 1/19/22

DIVISION OF WATER AFFIRMATION

Signature: Date:

WELL OWNER AFFIRMATION

I, the undersigned, understand the above described well is not in compliance with the water well construction practices and standards established by the Kentucky Energy and Environment Cabinet. I acknowledge that the driller has requested a variance to allow the well to be constructed according to the conditions described in this variance request. By signing below, I give my permission for the well to be constructed as described above. If this variance well is constructed to the specifications of this variance and results in degradation of groundwater quality, I will be financially responsible for remedial measures for this well, including plugging if necessary.

Tracy Cole 1-20-22

Signature: Date:

VARIANCE REQUEST SUPPLEMENTAL INFORMATION
Big Rivers Electric Corporation D.B. Wilson Station
Monitoring Well MW-10D (AKGWA #: 8007-8616)

Location of MW-10D (AKGWA Number: 8007-8616)



(Image Source: Google Earth, accessed January 17, 2022; image date 10/2020)

Monitoring Well MW-10D is located near the western property boundary of BREC D.B. Wilson Station, 0.14 miles north of Kentucky Route 85, and 0.75 miles east of Green River.

Monitoring Well MW-10D was drilled 75 feet through suspected mine spoils where shale was encountered. The well screen was placed from 65.00 – 75.00 ft bgs. The depth to groundwater at MW-10D was 10 ft bgs.

Reason For Variance:

Based on previous well construction experience from installing new monitoring well MW-112 completed in suspected mine spoils where a separate emergency variance request was verbally approved because the annular seal could not be constructed using high-solids bentonite grout slurry due to loss of slurry into void(s) in the mine spoils, an emergency variance was requested for subsequent remaining new monitoring wells MW-111 and MW-10D to be drilled/installed where mine spoils were encountered.

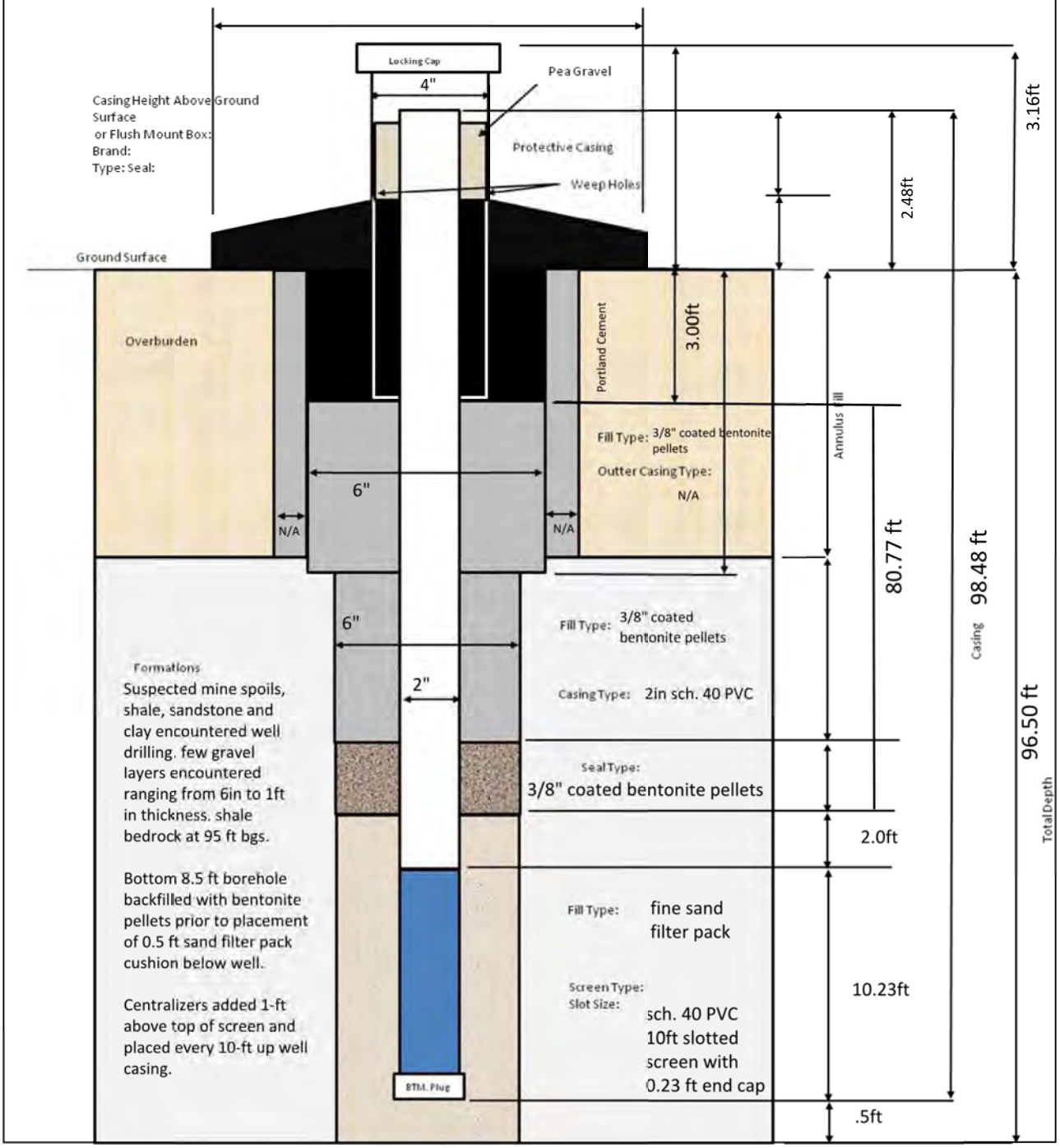
Verbal approval was given by the Kentucky Department of Waste Management (KDWM) for an emergency variance to use bentonite pellets as the annular seal. At MW-10D, bentonite pellets were emplaced by slowly pouring the bentonite pellets from the bucket into the borehole and allowed to gravity fall around the annular space of the well to 3.00-feet bgs (3.00-63 ft bgs). During placement of the bentonite pellets, the depth to top of bentonite pellets was continuously checked/monitored with a tape measure to verify bridging of the bentonite was not taking place. Once the top of bentonite pellets were above the water table, approximately 5gallons of water were added for every one-half (1/2) bucket of pellets.

The field conditions encountered and approved variance well construction procedures performed as described above are documented in the attached well construction diagram form for MW-10D. The

ground surface, top of casing, and bottom of boring elevations will be surveyed and included in a separate monitoring well installation report.

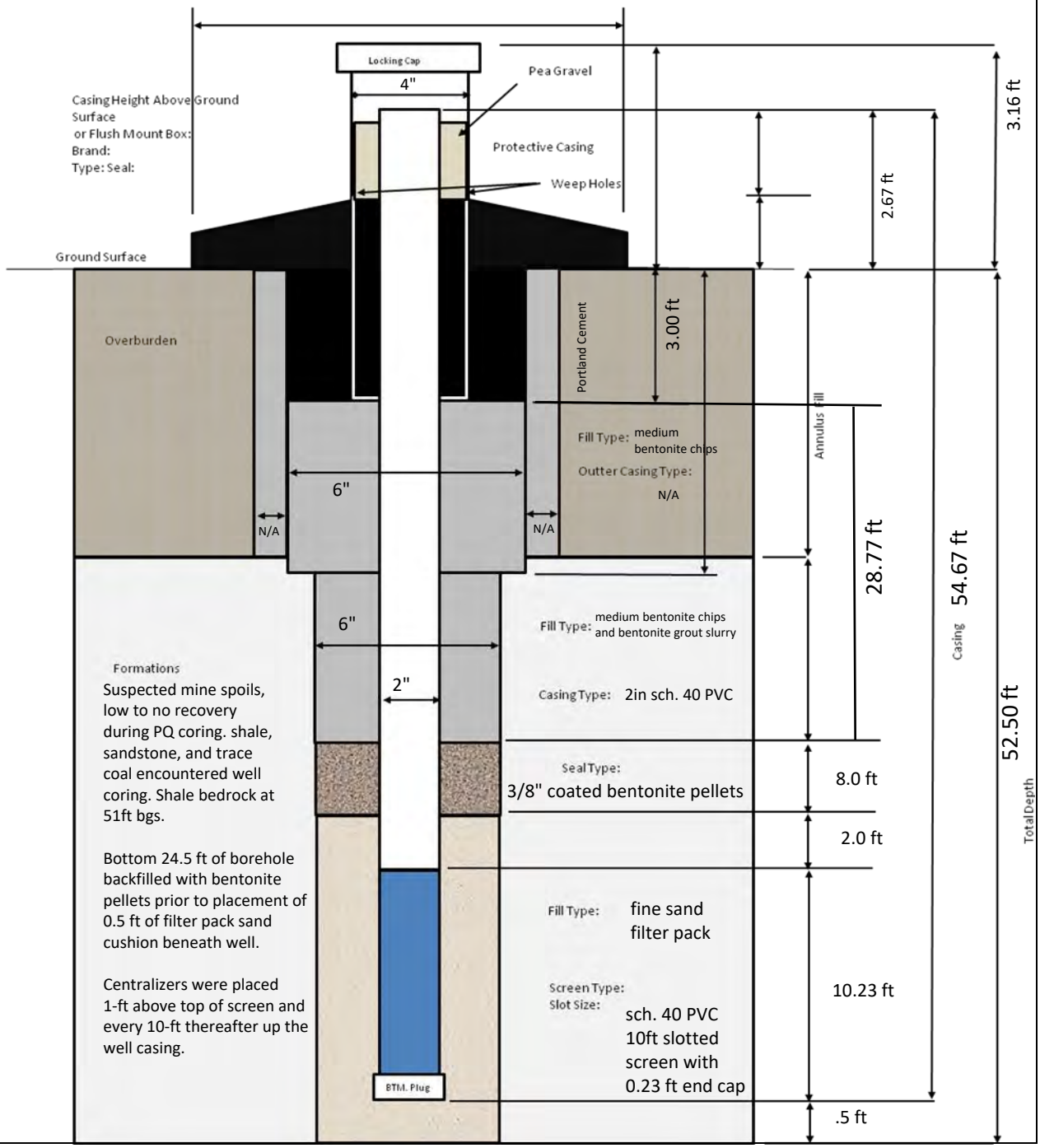
APPENDIX H – MONITORING WELL CONSTRUCTION DIAGRAMS

Project # 139018	**Date Installed** 1/8/22	**Well ID#** MW-111 8007-8615
Client Big Rivers Electric Corporation	**Location** Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 463.58 ft	**Top of Casing Elevation** 466.06 ft	**Bottom of Boring Elevation** 358.58 ft



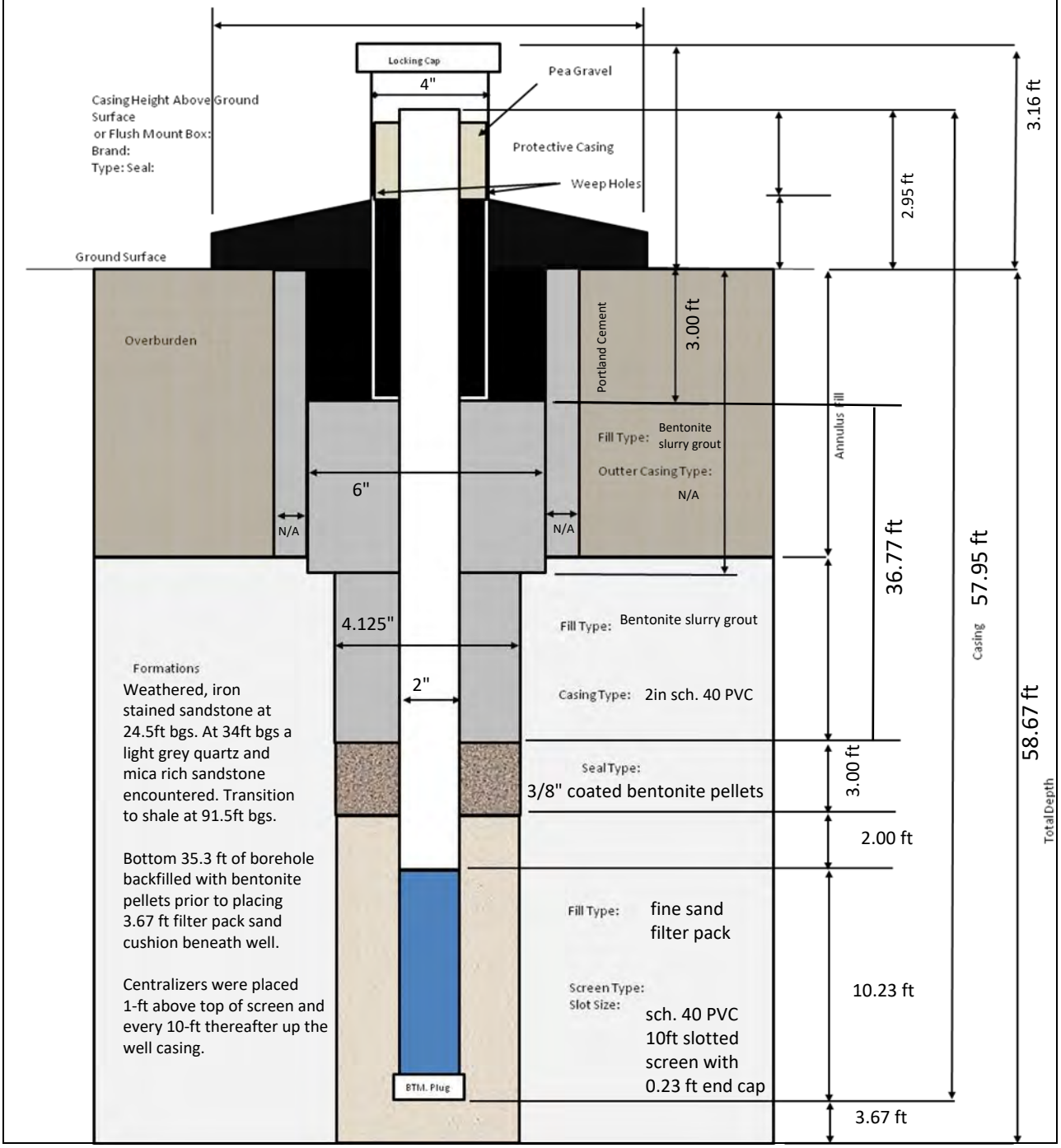
Bentonite slurry grout was not used as planned for the annular seal above the bentonite pellet seal. Instead, verbal emergency variance approved by KDWM to use 3/8-inch bentonite pellets for the annular seal.

Project # 139018	**Date Installed** 1/4-1/5/22	**Well ID#** MW-112 8007-8614
Client Big Rivers Electric Corporation	**Location** BREC Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 401.15 ft	**Top of Casing Elevation** 403.82 ft	**Bottom of Boring Elevation** 345.15 ft

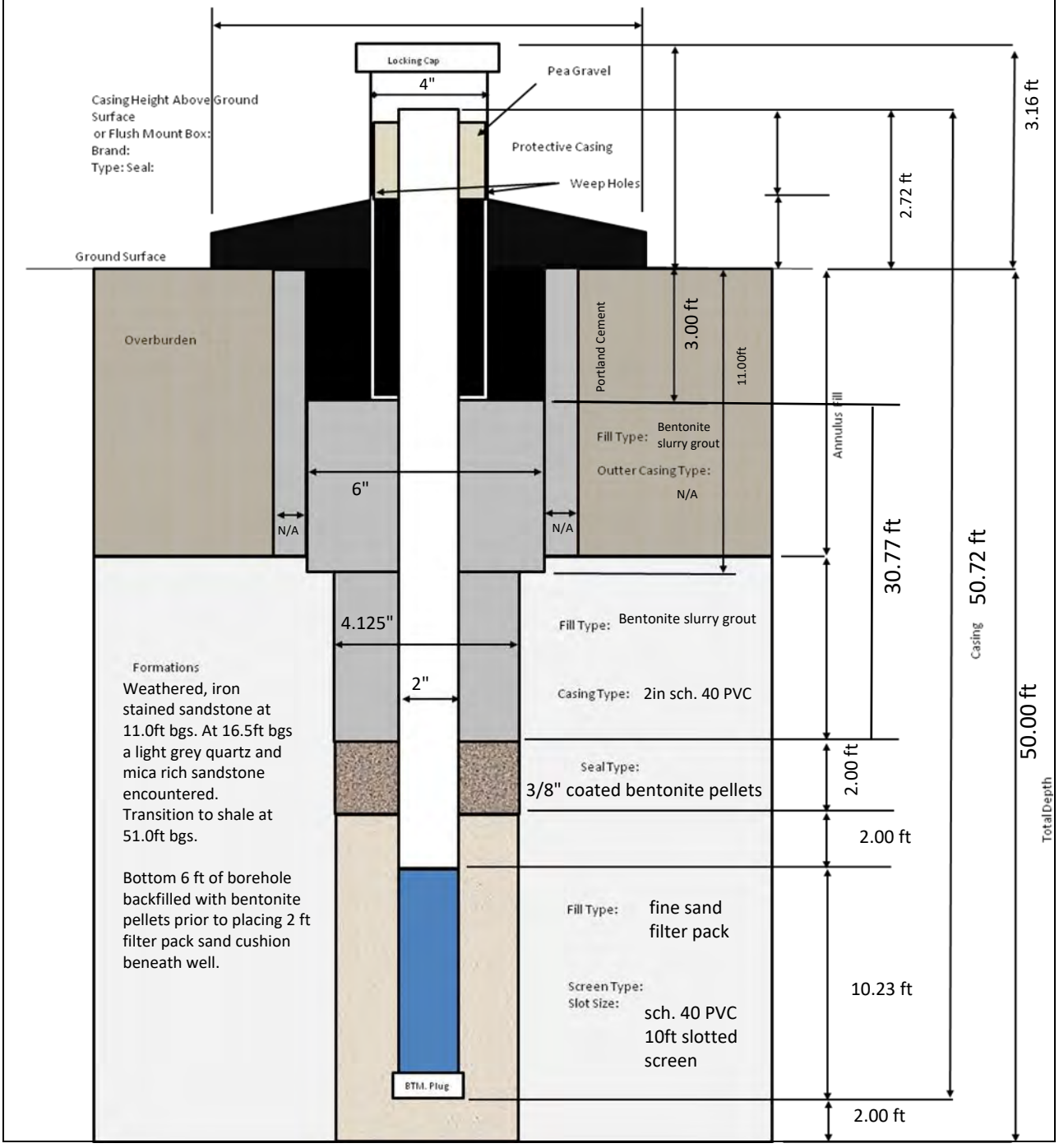


Bentonite slurry grout was not used as planned for the annular seal above the bentonite pellet seal. instead, verbal emergency variance approved by KDWM to us 3/8-inch bentonite chips for most of annular seal. bentonite slurry was placed from 26-32 ft bgs; bentonite chips 3-26 ft bgs.

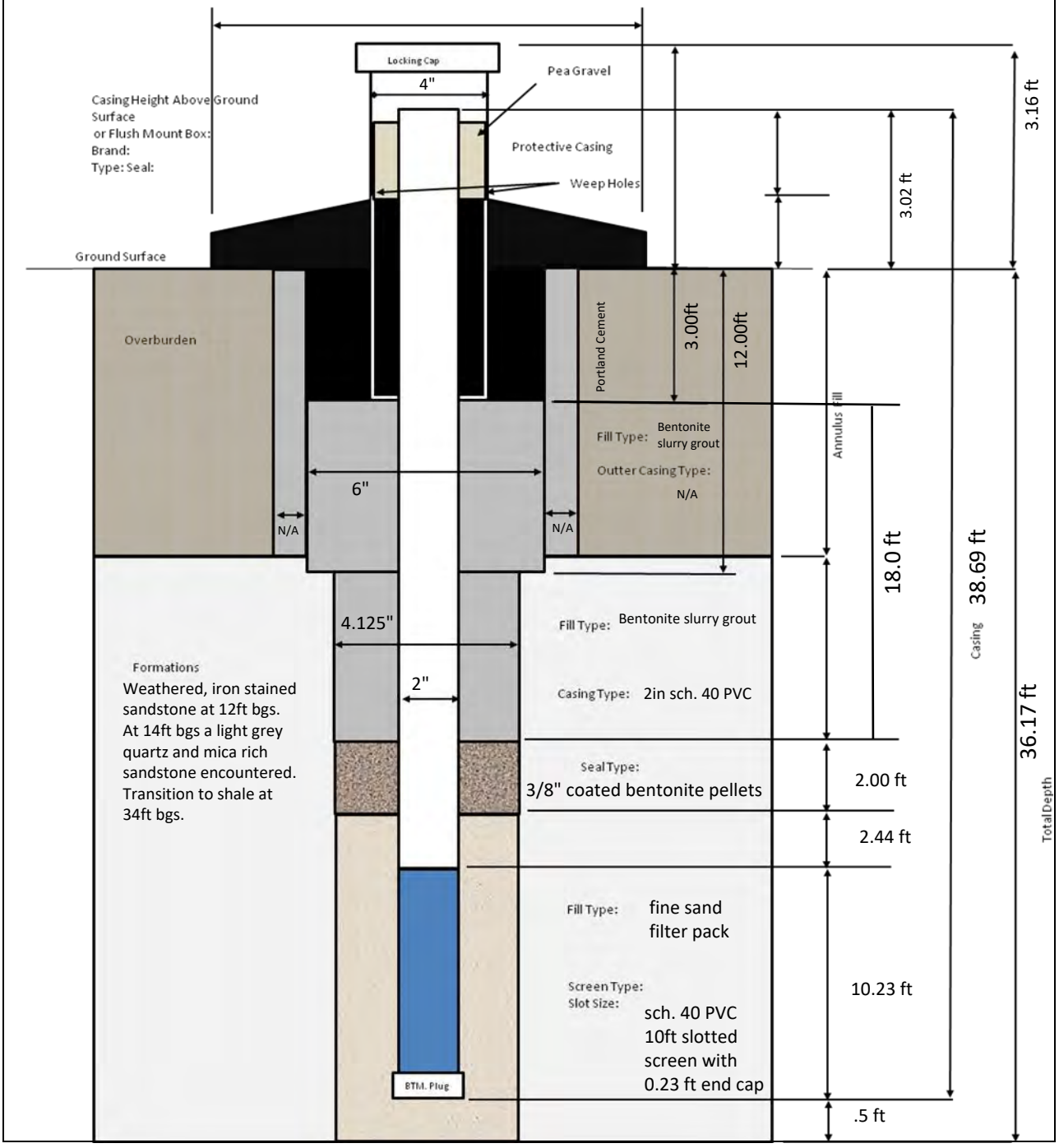
Project # 139018	**Date Installed** 12/12/21	**Well ID#** MW-113 8007-1174
Client Big Rivers Electric Corporation	**Location** BREC Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 408.66 ft	**Top of Casing Elevation** 411.61 ft	**Bottom of Boring Elevation** 314.66 ft



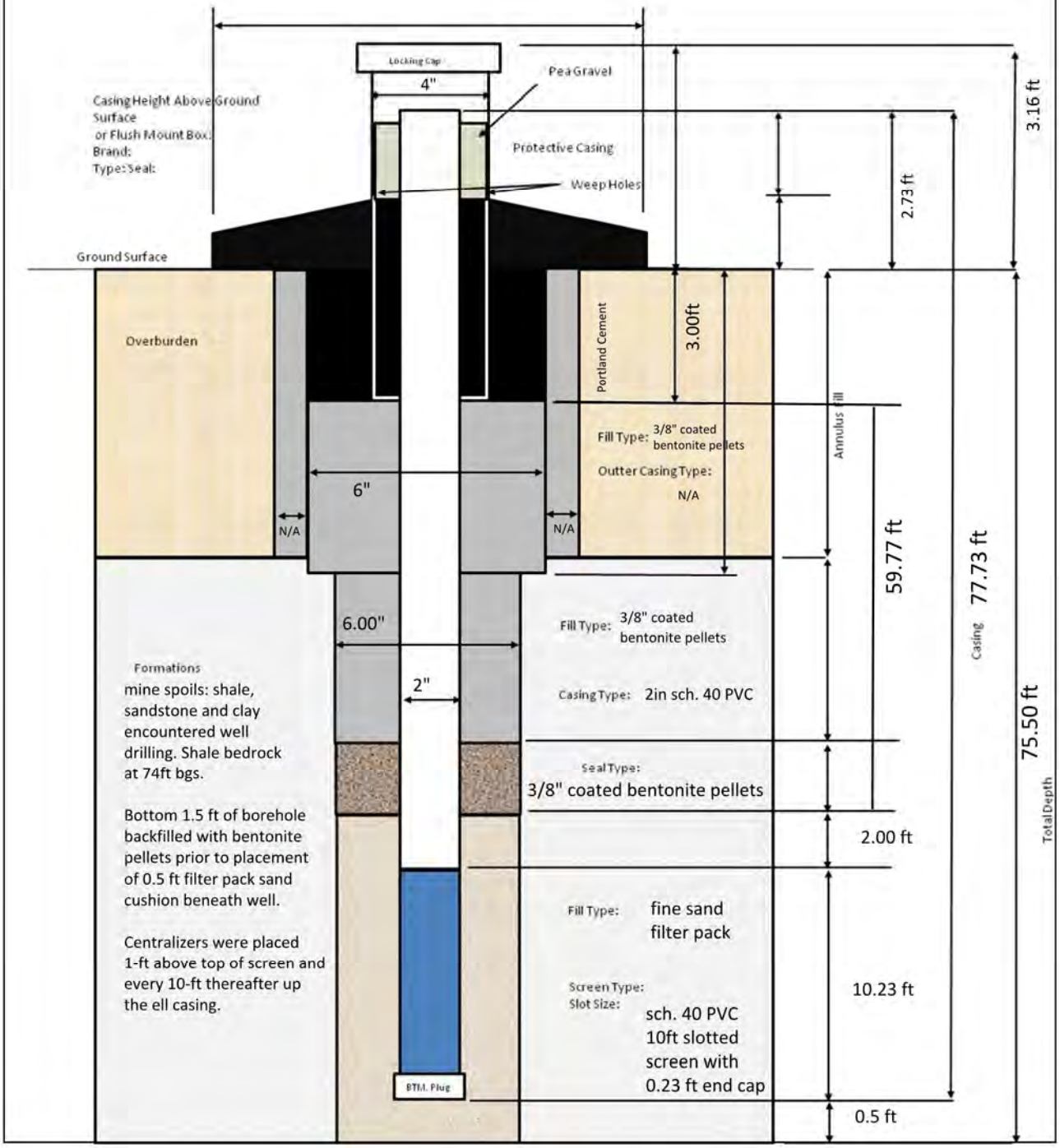
Project # 139018	**Date Installed** 12/21/21	**Well ID#** MW-114 8007-8613
Client Big Rivers Electric Corporation	**Location** BREC Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 401.46 ft	**Top of Casing Elevation** 404.18 ft	**Bottom of Boring Elevation** 345.46 ft



Project # 139018	**Date Installed** 12/8/21	**Well ID#** MW-105R 8007-1175
Client Big Rivers Electric Corporation	**Location** BREC Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 394.11ft	**Top of Casing Elevation** 397.13 ft	**Bottom of Boring Elevation** 357.94 ft



Project # 139018	Date Installed 1/11/22	Well ID# MW-10D 8007-8616
Client Big Rivers Electric Corporation	**Location** BREC Wilson Station	**Installed By** Cascade Environmental
Ground Elevation 396.27 ft	**Top of Casing Elevation** 399.00 ft	**Bottom of Boring Elevation** 319.27 ft



Bentonite slurry grout was not used as planned for the annular seal above the bentonite pellet seal. Instead, verbal emergency variance approved by KDWM to use 3/8-inch bentonite pellets for the annular seal.

APPENDIX I – UNIFORM KENTUCKY WELL CONSTRUCTION RECORD

Thank you for submitting your information via the Kentucky Energy and Environment Cabinet eForms website. Please save a copy of this submittal for your records. We recommend saving a copy as a .mht, .html, or .htm file. Your Submittal ID and Transaction ID will be included in an email after EEC Staff have reviewed your submittal.
The Submittal ID for this transaction is 275856 and was submitted on February 08, 2022 01:49 PM Eastern Time. If you need to contact EEC regarding your submission, please reference your Submittal ID.

The eForm Submittal ID allows you to use the data from this submittal as a template and/or download a copy of your submittal.

UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)

Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.

8007-1175

Owner Well ID#

MW-105R

Reference Point

Upgradient/Backgrc

Well use(*)

Monitoring well - an

General Comments:

Applicant Comment:

EEC Reviewer Comment:

Monitoring Well Info

Monitoring Well Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Wellhead

Manhole cover and gasket ?(*)	if so, diameter (in):(✓)	Dedicated pump(*)
No	diameter (in)	No pump

Flush mount(*)	Cap(*)
No	Water-tight and lockable

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Information Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Indiana	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ **Please check the checkbox if site address is same as the owner address**

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Use and Specification Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Well Specifications

Active(*)	Unsuitable for Intended use(*)
Yes	No

Discharge permit required?(*)	Withdrawal permit required?(*)
No	No

Artesian/flowing(*)	If so, height (in):(✓)	Nested wells(*)	If so, number:(✓)
No		No	

Well Location

Well Location Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees)(*)	Method(*)
37.451699	-87.097286	GPS
USGS 7.5' quadrangle(*)	**County(*)**	**Physiographic region(*)**
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
394	Survey	No

Construction

Well Construction Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Install start date(*)	Install end date(*)
12/7/2021	12/8/2021
Drilling method(*)	**Specify drilling method combinations(✓)**
Sonic	sonic to 12' then diamond core to 36'

Drilling method has no annular space(*)	Multiple screens ?(*)	Well development method(*)	Specify development method combinations(✓)
No	No	Combination	pump and surge

Surface Completion :

Protective surface casing(*)	Protective surface casing type(✓)	Protective surface casing height above surface(in)(✓)	Water-tight locking cap(*)
Yes	Steel	36	Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	Bumper guards?(*) if so, enter number below:	Weep holes(*) if yes, enter number below
Yes 36x36x6	Yes 4	Yes 2

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
36	12

Static water level (ft bgs):	SWL method(✓)
9	Measured

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	25.	5.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
25.	35.	5.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Grout	3.	21.	Bentonite

Seal	21.	23.	Bentonite pellets
Filterpack	23.	35.	Sand

Lithologic log

From Depth (ft)	To Depth (ft)	Description
0	12	clay
12	34.	sand stone
34.	36.	shale

Comments

Affirmation Review Comments:

Applicant Comment:

EEC Reviewer Comment:

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/7/2022**
Driller first name(*)	**William**
Driller middle initial	**R**
Driller last name(*)	**Gordon**
Driller suffix	Driller suffix
Certification number(*)	**0492-0549-00**
Certification company(*)	

Certification Company( )	**Cascade Drilling**

Click to Save Values for Future Retrieval | Click to Submit to EEC

Thank you for submitting your information via the Kentucky Energy and Environment Cabinet eForms website. Please save a copy of this submittal for your records. We recommend saving a copy as a .mht, .html, or .htm file. Your Submittal ID and Transaction ID will be included in an email after EEC Staff have reviewed your submittal.
The Submittal ID for this transaction is 275073 and was submitted on February 03, 2022 03:31 PM Eastern Time. If you need to contact EEC regarding your submission, please reference your Submittal ID.

The eForm Submittal ID allows you to use the data from this submittal as a template and/or download a copy of your submittal.

UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)	Owner Well ID#	Well use(*)
Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.	MW-111	Monitoring well - an
8007-8615	Reference Point: Downgradient	

Monitoring Well Info

Wellhead

Manhole cover and gasket ?(*)	if so, diameter (in):(✓)	Dedicated pump(*)
No	diameter (in)	No pump

Flush mount(*)	Cap(*)
No	Water-tight and lockable

Owner Name and Address Information

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Kentucky	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Active(*)	Unsuitable for Intended use(*)
Yes	No
Discharge permit required?(*)	**Withdrawal permit required?(*)**
No	No

Artesian/flowing(*)	If so, height (in):(✓)	Nested wells(*)	If so, number:(✓)
No		No	

Well Location

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees)(*)	Method(*)
37.458315	-87.09735	Survey
USGS 7.5' quadrangle(*)	**County(*)**	**Physiographic region(*)**
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
463.58	Survey	No

Construction

Install start date(*)	Install end date(*)
1/6/2022	1/8/2022
Drilling method(*)	**Specify drilling method combinations(✓)**
Sonic	Specify drilling method combinations

Drilling method has no annular space(*)	Multiple screens ?(*)	Well development method(*)	Specify development method combinations(✓)
No	No	Combination	pump and surge

Surface Completion :

Protective surface casing(*)	Protective surface casing type(✓)	Protective surface casing height above surface(in)(✓)	Water-tight locking cap(*)
Yes	Steel	34	Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	Bumper guards?(*) if so, enter number below:	Weep holes(*) if yes, enter number below
	Yes	Yes

Yes	4	2
36x36x6		

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
96	95

Static water level (ft bgs):	SWL method(✓)
76	Reported

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	86.	6.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
86.	96.	6.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Seal	3.	84.	Bentonite pellets
Filterpack	84.	96.5	Sand

Lithologic log

From Depth (ft)	To Depth (ft)	Description
0	10.	Brown Silty Clay

10.	95.	Mine Spoils
95.	105.	Shale

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/3/2022**
Driller first name(*)	**Jason**
Driller middle initial	**A**
Driller last name(*)	**Greer**
Driller suffix	Driller suffix
Certification number(*)	**0492-0608-00**
Certification company(*)	**Cascade Drilling, L.P.**

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UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)	Owner Well ID#	Well use(*)
Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.	MW-112	Monitoring well - an
8007-8614	Reference Point: Downgradient	

Monitoring Well Info

Wellhead

Manhole cover and gasket ?(*)	if so, diameter (in):(✓)	Dedicated pump(*)
No	diameter (in)	No pump

Flush mount(*)	Cap(*)
No	Water-tight and lockable

Owner Name and Address Information

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Kentucky	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Active(*)	Unsuitable for Intended use(*)
Yes	No
Discharge permit required?(*)	**Withdrawal permit required?(*)**
No	No

Artesian/flowing(*)	If so, height (in):(✓)	Nested wells(*)	If so, number:(✓)
No		No	

Well Location

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees)(*)	Method(*)
37.456032	-87.099078	Survey
USGS 7.5' quadrangle(*)	**County(*)**	**Physiographic region(*)**
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
401.15	Survey	No

Construction

Install start date(*)	Install end date(*)
1/4/2022	1/5/2022
Drilling method(*)	**Specify drilling method combinations(✓)**
Combo (specify)	Sonic drill to set overburden 6" temp casing to 24', Diamond PQ

Drilling method has no annular space(*)	Multiple screens ?(*)	Well development method(*)	Specify development method combinations(✓)
No	No	Combination	pump and surge

Surface Completion :

Protective surface casing(*)	Protective surface casing type(✓)	Protective surface casing height above surface(in)(✓)	Water-tight locking cap(*)
Yes	Steel	34	Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	Bumper guards?(*) if so, enter number below:	Weep holes(*) if yes, enter number below
	Yes	Yes

Yes 36x36x6	4	2

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
52	20

Static water level (ft bgs):	SWL method(✓)
15	Reported

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	42.	5.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
42.	52.	5.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Grout	3.	38.	Bentonite chips
Seal	38.	40.	Bentonite pellets
Filterpack	40.	52.5	Sand

Lithologic log

From Depth (ft)	To Depth (ft)	Description

0	20.	Brown Silty Clay
26.	51.	Mine Spoils
20.	26.	Sandstone
51	56	Shale

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/3/2022**
Driller first name(*)	**Jason**
Driller middle initial	**A**
Driller last name(*)	**Greer**
Driller suffix	Driller suffix
Certification number(*)	**0492-0608-00**
Certification company(*)	**Cascade Drilling, L.P.**

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UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)	Owner Well ID#	Well use(*)
Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.	MW-113	Monitoring well - an
8007-1174	Reference Point: Upgradient/Backgrc	

Monitoring Well Info

Wellhead

Manhole cover and gasket ?(*)	if so, diameter (in):(✓)	Dedicated pump(*)
No	diameter (in)	No pump

Flush mount(*)	Cap(*)
No	Water-tight and lockable

Owner Name and Address Information

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Indiana	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Active(*)	Unsuitable for Intended use(*)
Yes	No
Discharge permit required?(*)	**Withdrawal permit required?(*)**
No	No

Artesian/flowing(*)	If so, height (in):(✓)	Nested wells(*)	If so, number:(✓)
No		No	

Well Location

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees)(*)	Method(*)
37.451485	-87.086382	GPS
USGS 7.5' quadrangle(*)	**County(*)**	**Physiographic region(*)**
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
408.66	Survey	No

Construction

Install start date(*)	Install end date(*)
12/10/2021	12/12/2021
Drilling method(*)	**Specify drilling method combinations(✓)**
Sonic	sonic to 12' then diamond core to 94

Drilling method has no annular space(*)	Multiple screens ?(*)	Well development method(*)	Specify development method combinations(✓)
No	No	Combination	pump and surge

Surface Completion :

Protective surface casing(*)	Protective surface casing type(✓)	Protective surface casing height above surface(in)(✓)	Water-tight locking cap(*)
Yes	Steel	36	Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	Bumper guards?(*) if so, enter number below:	Weep holes(*) if yes, enter number below
	Yes	Yes

Yes	4	2
36x36x6		

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
94	12

Static water level (ft bgs):	SWL method(✓)
22	Measured

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	45.	5.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
45.	55.	5.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Grout	3.	41.	Bentonite
Seal	41.	43.	Bentonite pellets
Filterpack	43.	58.	Sand
Seal	58.	94.	Bentonite pellets

Lithologic log

From Depth (ft)	To Depth (ft)	Description
0	12	clay
12	93	sand stone
93	94	shale

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/7/2022**
Driller first name(*)	**William**
Driller middle initial	**R**
Driller last name(*)	**Gordon**
Driller suffix	Driller suffix
Certification number(*)	**0492-0549-00**
Certification company(*)	**Cascade Drilling**

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UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)	Owner Well ID#	Well use(*)
Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.	MW-114	Monitoring well - an
8007-8613	Reference Point: Upgradient/Backgrc	

Monitoring Well Info

Wellhead

Manhole cover and gasket ?(*)	if so, diameter (in):(✓)	Dedicated pump(*)
No	diameter (in)	No pump

Flush mount(*)	Cap(*)
No	Water-tight and lockable

Owner Name and Address Information

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Kentucky	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Active(*) Yes	**Unsuitable for Intended use(*)** No
Discharge permit required?(*) No	**Withdrawal permit required?(*)** No

Artesian/flowing(*) No	**If so, height (in):(✓)**	**Nested wells(*)** No	**If so, number:(✓)**

Well Location

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well) 37.451117	**Well longitude(decimal degrees)(*)** -87.076054	**Method(*)** Driller Viewer
USGS 7.5' quadrangle(*) EQUALITY	**County(*)** Ohio	**Physiographic region(*)** W. Coal Field
Surface elevation(ft)(*) 401.46	**Surface elevation method(*)** Survey	**Well in flood zone?(*)** No

Construction

Install start date(*) 12/20/2021	**Install end date(*)** 12/21/2021
Drilling method(*) Combo (specify)	**Specify drilling method combinations(✓)** Sonic drill to set overburden 6" temp casing to 11', Diamond PQ

Drilling method has no annular space(*) No	**Multiple screens ?(*)** No	**Well development method(*)** Combination	**Specify development method combinations(✓)** pump and surge

Surface Completion :

Protective surface casing(*) Yes	**Protective surface casing type(✓)** Steel	**Protective surface casing height above surface(in)(✓)** 34	**Water-tight locking cap(*)** Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	**Bumper guards?(*) if so, enter number below:** Yes	**Weep holes(*) if yes, enter number below** Yes

Yes 36x36x6	4	2

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
48	11

Static water level (ft bgs):	SWL method(✓)
11	Reported

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	38.	5.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
38.	48.	5.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Grout	3.	34.	Bentonite
Seal	34.	36.	Bentonite pellets
Filterpack	36.	48.5	Sand

Lithologic log

From Depth (ft)	To Depth (ft)	Description

0	9.	Brown Silty Sand
11.	51.	Sandstone
9.	11.	Sandy Clay
51	56	Shale

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/3/2022**
Driller first name(*)	**Jason**
Driller middle initial	**A**
Driller last name(*)	**Greer**
Driller suffix	Driller suffix
Certification number(*)	**0492-0608-00**
Certification company(*)	**Cascade Drilling, L.P.**

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The Submittal ID for this transaction is 275085 and was submitted on February 03, 2022 03:49 PM Eastern Time. If you need to contact EEC regarding your submission, please reference your Submittal ID.

The eForm Submittal ID allows you to use the data from this submittal as a template and/or download a copy of your submittal.

UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Install only

Kentucky Well ID (AKGWA) Number(*)

Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.

8007-8616

Owner Well ID#

MW-10D

Reference Point

Downgradient

Well use(*)

Monitoring well - an

Monitoring Well Info

Wellhead

Manhole cover and gasket ?(*)

No

if so, diameter (in):(✓)

diameter (in)

Dedicated pump(*)

No pump

Flush mount(*)

No

Cap(*)

Water-tight and lockable

Owner Name and Address Information

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	Centertown	Kentucky	42328

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Active(*)	Unsuitable for Intended use(*)
Yes	No
Discharge permit required?(*)	**Withdrawal permit required?(*)**
No	No

Artesian/flowing(*)	If so, height (in):(✓)	Nested wells(*)	If so, number:(✓)
No		No	

Well Location

Well latitude(decimal degrees)(*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees)(*)	Method(*)
37.454901	-87.089898	Survey
USGS 7.5' quadrangle(*)	**County(*)**	**Physiographic region(*)**
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
396.27	Survey	No

Construction

Install start date(*)	Install end date(*)
1/10/2022	1/11/2022
Drilling method(*)	**Specify drilling method combinations(✓)**
Sonic	Specify drilling method combinations

Drilling method has no annular space(*)	Multiple screens ?(*)	Well development method(*)	Specify development method combinations(✓)
No	No	Combination	pump and surge

Surface Completion :

Protective surface casing(*)	Protective surface casing type(✓)	Protective surface casing height above surface(in)(✓)	Water-tight locking cap(*)
Yes	Steel	34	Yes

Concrete pad?(*) if Yes, enter length(in) X Width(in) X height(in) in textbox below	Bumper guards?(*) if so, enter number below:	Weep holes(*) if yes, enter number below
	Yes	Yes

Yes 36x36x6	4	2

Outer casing(*)	Outer casing type(✓)	Outer casing height above surface(in)(✓)	Outer casing 2 foot above flood level ?(✓)
No			

Inner casing(*)	Inner casing type(✓)	Inner casing height above surface(in)(✓)	Inner casing 2 foot above flood level ?(✓)
Yes	PVC	30	Yes

Please report depths in feet below ground surface,

Total depth (ft bgs):(*)	Depth to bedrock (ft bgs):(✓)
75	74

Static water level (ft bgs):	SWL method(✓)
10	Reported

Casing/open borehole:

(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Casing OD (in)	Casing ID (in)	Casing Type
0.	65.	6.	2.37	2.06	PVC

Screen:

From Depth (ft)	To Depth (ft)	Borehole diameter (in)	Screen OD (in)	Screen ID (in)	Screen Type	Screen Slot Size (in)
65.	75.	6.	2.37	2.06	PVC	0.10

Annulus fill and seal

Section	From Depth (ft)	To Depth (ft)	Material
Seal	3.	63.	Bentonite pellets
Filterpack	63.	75.5	Sand

Lithologic log

From Depth (ft)	To Depth (ft)	Description
0	10.	Brown Sandy Clay

10.	74.	Mine Spoils
74.	77.	Shale

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	**2/3/2022**
Driller first name(*)	**Jason**
Driller middle initial	**A**
Driller last name(*)	**Greer**
Driller suffix	Driller suffix
Certification number(*)	**0492-0608-00**
Certification company(*)	**Cascade Drilling, L.P.**

Click to Save Values for Future Retrieval | Click to Submit to EEC

APPENDIX J – MW-105 ABANDONMENT RECORD AND SUPPORTING DOCUMENTS

Thank you for submitting your information via the Kentucky Energy and Environment Cabinet eForms website. Please save a copy of this submittal for your records. We recommend saving a copy as a .mht, .html, or .htm file. Your Submittal ID and Transaction ID will be included in an email after EEC Staff have reviewed your submittal.
The Submittal ID for this transaction is 275606 and was submitted on February 07, 2022 03:00 PM Eastern Time. If you need to contact EEC regarding your submission, please reference your Submittal ID.

The eForm Submittal ID allows you to use the data from this submittal as a template and/or download a copy of your submittal.

UNIFORM KENTUCKY WATER/MONITORING WELL REPORTING RECORD

Use this form to report installation, modification or decommissioning of any temporary or permanent monitoring or water wells

Form must be completed and submitted to the Division of Water within 60 days of completion of work

(*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

Purpose of the application(*)

Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp) If you still need one, contact DOWDrillersProgram@ky.gov (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.

Plugging/Decommission

Kentucky Well ID (AKGWA) Number(*)	Owner Well ID#	Well use(*)
Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.	**MW-105**	**Monitoring well - an**
8007-2992	Reference Point: **Upgradient/Backgrc**	

Owner Name and Address Information

â€œEnter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individualâ€

Owner Business name(✓)	Owner first name(✓)	Owner middle initial	Owner last name(✓)
Big Rivers Electric Corp	Owner first nan	Middle i	Owner last nam

Owner address(*)	Owner city(*)	Owner state(*)	Owner zipcode(*)
5663 State Route 85 W	**Centertown**	**Kentucky**	**42328**

Owner telephone:(*)

270-844-5000

Site Name, Address and Agency Information

☑ Please check the checkbox if site address is same as the owner address

Agency Interest (AI) Number:	Program type	Permit or ID Number
3319	Solid Waste	

Site Name(*)	Site telephone:
Big Rivers Electric Corp - Wilson Static	270-844-5000

Site Address(*)	Site city(*)	Site state(*)	Site zipcode(*)
5663 KY 85 W	Centertown	Kentucky	42328

Supporting Documentation

Site Map/Sketch Map(✓)	Upload file
Well location	Upload file
Well Diagram (monitoring well)	Upload file
Bacteria analysis (if applicable)	Upload file
Approved variance (if applicable)	Upload file
Drilling log (optional)	Upload file
Other laboratory analysis report (optional)	Upload file
Aquifer test results (optional)	Upload file
Casing/Screen Supplemental Info (if applicable)	Upload file
Other documentation (optional)	Upload file

Well Specifications

Well Status(*)	Well Condition(*)
Plugged	Overdrilled and grouted

Well Location

Well latitude(decimal degrees) (*)Driller Viewer (http://watermaps.ky.gov/well)	Well longitude(decimal degrees) (*)	Method(*)
37.451642	-87.097315	GPS

USGS 7.5' quadrangle(*)	County(*)	Physiographic region(*)
EQUALITY	Ohio	W. Coal Field
Surface elevation(ft)(*)	**Surface elevation method(*)**	**Well in flood zone?(*)**
394	Survey	No

Plugging:

Plugging activity:(*)	Was well disinfected?(*)
Well overdrilled, casing-screen-grout-filter pack r	No
Work start date(*)	**Work end date(*)**
12/8/2021	12/8/2021
Screened from depth (ft) :	**Screened to depth (ft):**
50	60

Total depth (ft) :	Casing Diameter (in):	Casing material:
60.5	2.37	PVC

Sealing material:

From Depth (ft)	To Depth (ft)	Description (sealing material)
0.	60. 5	Mixture - bentonite/cement

Comments

Affirmation

I certify under penalty of law that this document/electronic submittal and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Date affirmed(*)	2/7/2022
Driller first name(*)	William
Driller middle initial	R
Driller last name(*)	Gordon

Driller suffix	Driller suffix
Certification number(*)	0492-0549-00
Certification company(*)	Cascade Drilling

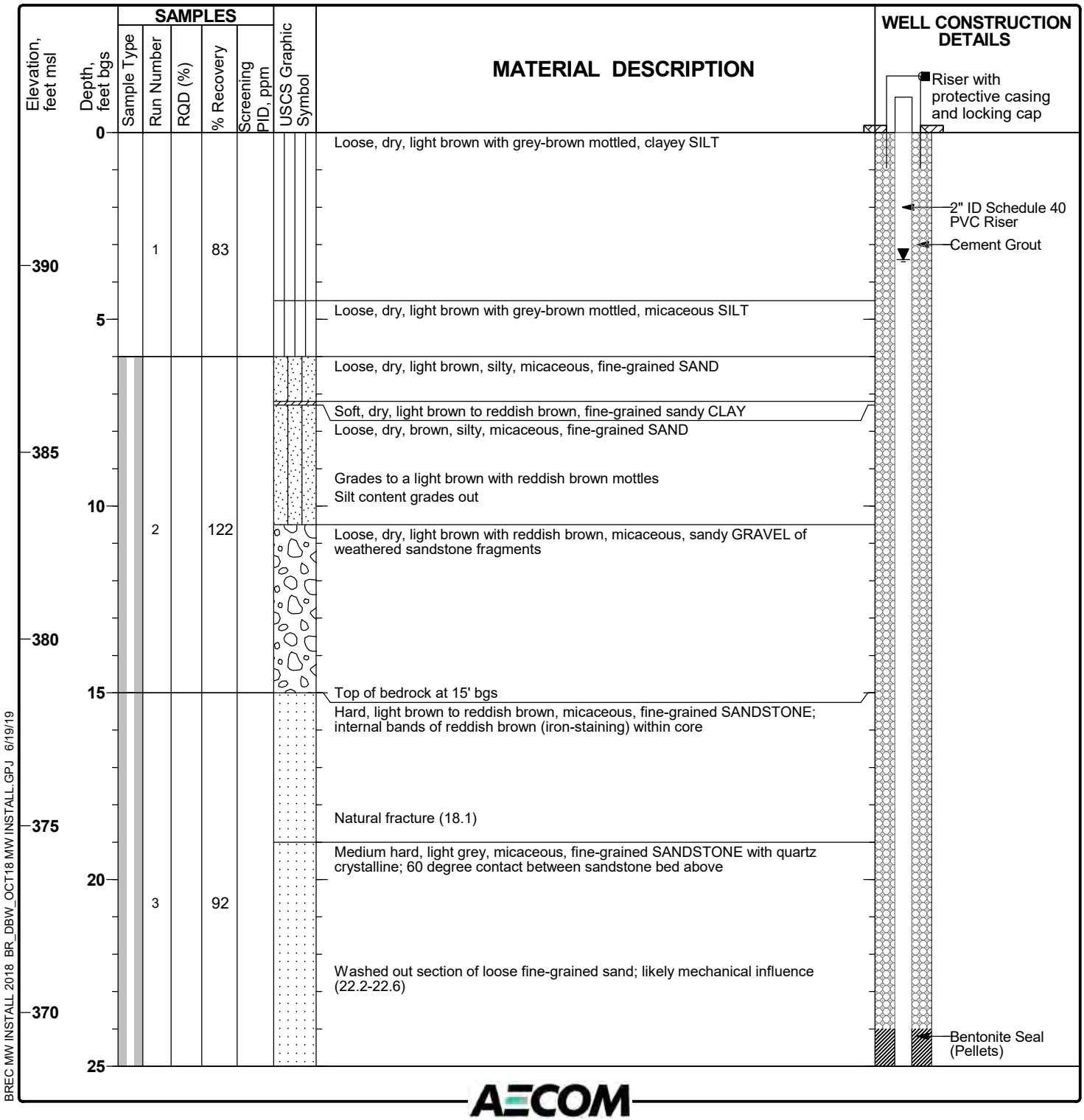
Click to Save Values for Future Retrieval | Click to Submit to EEC

Client: Big River Electric Co.
Project: DB Wilson Station
Site: Centertown, KY
Project Number: 60589938

MW-105

Sheet 1 of 3

Date(s) Drilled and Installed	**10/11/18-10/12/18**	Logged By	**S. Lillard**	Reviewed By	**M. Wagner**
Drilling Method	**Rotosonic**	Drilling Contractor	**Cascade**	Total Depth of Borehole	**60.0 feet**
Sampling Method	**4" Sonic Sampler**	Water Level	**3.4 b.g.s. (measured 10/13/18)**	Top of Casing Elevation	**396.74 feet msl**
Size and Type of Well Casing	**2" PVC Schedule 40**	Screen Perforation	**0.010 inch slotted**	Ground Surface Elevation	**393.56 feet msl**
Seal or Backfill	**Bentonite/Cement Grout**	Coordinates	**N 409,924.75 E 1,608,904.52**	AKGWA #	**8007-2992**



BREC MW INSTALL 2018 BR_DBW_OCT18 MW INSTALL.GPJ 6/19/19

AECOM

Client: Big River Electric Co.
Project: DB Wilson Station
Site: Centertown, KY
Project Number: 60589938

MW-105

Sheet 2 of 3

Elevation, feet msl	Depth, feet bgs	SAMPLES: Sample Type	Run Number	RQD (%)	% Recovery	Screening PID, ppm	USCS Graphic Symbol	MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
	25							Washed out section; mechanical influence (25.6-25.8) Loose, grey, silty sand at bottom of run (25.9)	
								Natural fracture (27.5)	Filter Pack Sand #5
365								Medium hard, grey, slightly weathered SHALE with fine-crystalline quartz	
	30		4		97				
								Natural fracture (32.1)	
360									
	35								
			5		110				
355								Medium hard, dark grey, fresh to slightly weathered in sections SHALE with fine-crystalline quartz	
	40								
350									
	45		6		98				
								Moderately weathered shale (47.3-47.7)	
345									
	50								2" ID Schedule 40 PVC 0.010" Slotted Screen
340									

BREC MW INSTALL 2018 BR_DBW_OCT18 MW INSTALL.GPJ 6/19/19

AECOM

Client: Big River Electric Co.
Project: DB Wilson Station
Site: Centertown, KY
Project Number: 60589938

MW-105

Sheet 3 of 3

Elevation, feet msl	Depth, feet bgs	SAMPLES: Sample Type	SAMPLES: Run Number	SAMPLES: RQD (%)	SAMPLES: % Recovery	SAMPLES: Screening PID, ppm	USCS Graphic Symbol	MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
	55		7		72				
335									
	60							End of boring at 60' bgs	
330									
	65								
325									
	70								
320									
	75								
315									
	80								

BREC MW INSTALL 2018 BR_DBW_OCT18 MW INSTALL.GPJ 6/19/19

AECOM

UNIFORM KENTUCKY WELL CONSTRUCTION RECORD

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

Owner Name(*)	Big Rivers Electric Corporation				
Owner First Name(*)	NA	Owner Last Name(*)	NA		
Owner Address(*)	PO Box 24				
Owner City(*)	Henderson	State(*)	Kentucky	Owner Zip(*)	42419-0024
Owner Phone(*)	270-844-6031	Owner eMail			

Site Name(*)	D.B. Wilson Station				
Site Address(*)	5633 State Route 85 W				
Site City(*)	Centertown	State(*)	Kentucky	Site Zip(*)	42328
Site Phone	270-821-7343	Site eMail			
Well Latitude(*) DMS to DD Converter	37.451726	Well Longitude(*)	-87.097313	Method(*)	Paper or Internet Map Interpc

Agency Interest (AI) Number	3319	Facility Type & ID	Solid Waste — Special Waste Landfill

USGS Topo Map(*)	EQUALITY	County(*)	Ohio
Surface elevation (ft)	395.0	Elevation determined by	Topographic map interpolation
Physiographic Region(*)	W. Coal Field	Well Use(*)	Monitoring well - compliance
Drilling Method(*)	Sonic	Well Status(*)	active
Wellhead(*)	Locking Cap	Well Condition(*)	Functioning properly

Casing / Open Borehole

	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	50.0	6.0	2.0	PVC
Add New					

Screen

	From depth (ft)(*)(*)	To depth (ft)(*)(*)	Borehole diameter (in)(*)(*)	Screen diameter (in)(*)(*)	Screen Type(*)(*)	Screen slot size(*)(*)
Delete	50.0	60.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal

	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	24.0	Mixture - bentonite & cement
Delete	Seal	24.0	27.0	Bentonite
Delete	Filter Pack	27.0	60.5	Sand
Add New				

Lithologic log

	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

Site Map/ Sketch Map(*)	Choose File No file chosen
Well Diagram (monitoring well)	Choose File No file chosen
Coliform analysis (if applicable)	Choose File No file chosen
Signed variance (if applicable)	Choose File No file chosen
Other laboratory analysis report (if applicable)	Choose File No file chosen
Casing/ Screen Supplemental Info	Choose File No file chosen

Comments: 3'X3' concrete pad w/ 4 bollards.

Affirmation: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

Signature of certified driller & PIN(*)	Todd W Mills	Date Signed(*)	11/14/2018
Driller First Name(*)	Todd	Driller Last Name(*)	Mills
Certification Number(*)	0344-0454-00	Certification Company(*)	Chase Environmental Group, Inc.

Kentucky Well ID (AKGWA) Number(*)	8007-2992
Owner Well ID	MW-105
Work Start Date(*)	10/11/2018
Work End Date(*)	10/17/2018
Total depth (ft)(*)	60.0
Depth to bedrock (ft)	15.0
Static water level (ft)	53.0
SWL method(*)	Reported
Casing height above surface (in)	30

WATER WELLS ONLY

Estimated well yield	
Well Yield Method	
Well service (# of people served)	
Disinfectant amount	
Disinfectant type	
Pitless adapter installed	
Pump installed	
Depth to intake (ft)	

Appar ent quality and odor:

Appearance	
Odor Type	
Odor-Level	

Coliform Test

Coliform test type	
Coliform test results	or # colonies per 100 ml
Date Sampled	
Date Analyzed	

For Internal Staff Use Only

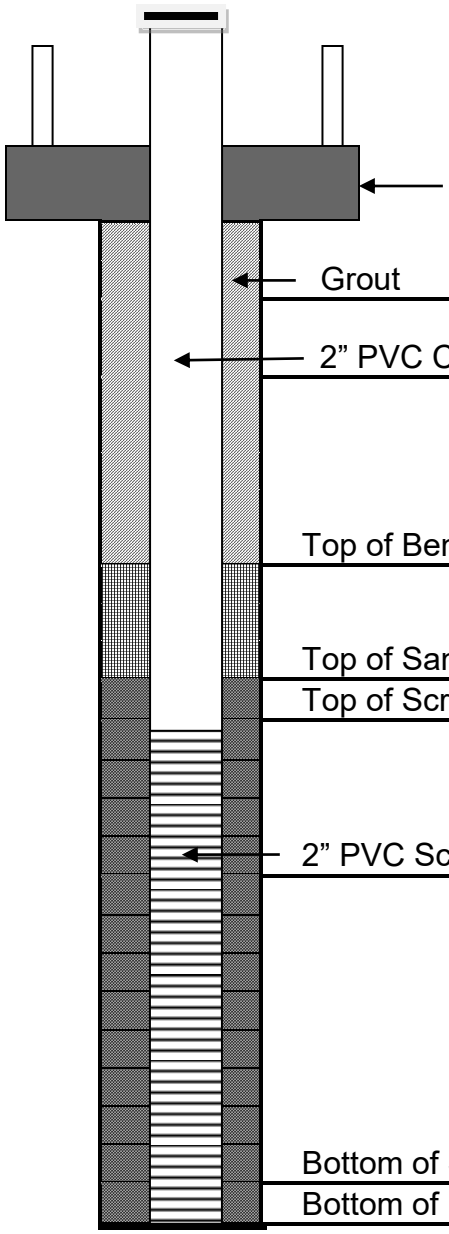
Date Received:	
Date Mapped:	
Mapped By:	

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MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-2992
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-105



Surface Completion with 3'X3' Pad, Riser Cover, and 4 Bollards – Per Specifications

Grout	22.0	Length of Grout
2" PVC Casing	50.0	Length of Casing
Top of Bentonite Seal	24.0	b.g.s.
Top of Sand Pack	27.0	b.g.s.
Top of Screen	50.0	b.g.s.
2" PVC Screen	10	Length of Screen
Bottom of Screen	60.0	b.g.s.
Bottom of Boring	60.5	b.g.s.

Depth to Groundwater	53.0	Total Depth of Boring (ft)	60.5	Total Depth of Well (ft)	60.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	15.0	Drilling in Consolidated	45.5
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk

CEG CHASE Environmental Group INC

Comments: Drawing not to scale.

APPENDIX K - MONITORING WELL DEVELOPMENT FORMS

Well Development Summary

Special Waste Landfill
Big Rivers Electric Corporation - Wilson Station
Centertown, Kentucky

Well Identification	Well Development (gallons and date)			Total Development (gallons and days)	3 Borehole Volumes (gallons)	Clear-Low Turbidity During Development?	3 Borehole Volumes Purged?
Piezometers							
MW-105R	5.5 12/14/2021	5.1 12/15/2021	7 12/20/2021	17.6 gallons 3 day	22.24	low turbidity during final development (0-22 NTUs)	No
MW-111	30.5 1/12/2022			30.5 gallons 1 days	17.27	low turbidty between surging (100 NTUs)	Yes
MW-112	60 1/7/2022			60 gallons 1 days	25.61	low turbidity between surging (16-40 NTUs)	Yes
MW-113	12.2 12/14/2021	6 12/15/2021	13.5 12/20/2021	31.7 gallons 3 days	25.62	low turbidity during final development (11-26 NTUs)	Yes
MW-114	10 1/5/2022	10 1/5/2022	10 1/5/2022	30 gallons 3 day	26.48	low turbidty during final development (6-15 NTUs)	Yes
MW-10D	60 1/12/2022			60 gallons 1 days	39.61	low turbidity between surging (25-48 NTUs)	Yes

Notes:
NTUs = Nephelometric turbidity units

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-105R**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	Big Rivers Electric Company Wilson Station	Ground Surface Elevation (GS):	394.110
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	397.110

Well Information		**Borehole Volume Calculation:**					
Date Well Installed:	12/08/21	Water Column =	28.71	feet	Filter Pack Porosity =	30%	
Total Depth of Well:	37.87 feet from TOC	1 Well Volume =	4.69	gallons	Filter Pack =	12.00 ft	Saturated Filter Pack = 12.00 ft
Depth to Top of Screen:	28.46 feet from TOC	1 well volume (gallons) = initial height of water column (ft) x .16					
Length of Casing Screened:	10.00 feet	Filter Pack Volume=	2.73	gallons			
Borehole Diameter:	4.75 inches	Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume					
Well Casing Diameter:	2.00 inches	3 Borehole Volume =	**22.24**	**gallons**			
Type of Formation Screened:	sandstone and shale	3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)					

Development Method

Equipment:				Method Description:
Surge		**Bail**		A pump was used to develop the well by surging before pumping. The pump was set at a moderate pumping rate as to get readings before going dry.
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed		Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
				Gallons	Total					
12/14/21	8:15	9.16	37.81	0.5	0.5	14.7	7	1266	na	high turbidity, light tan color
12/14/21	8:17		37.81	2.5	2.5	16.2	7.08	1405	na	high turbidity, light tan color
12/14/21	8:21	dry	37.81	5.5	5.5	15.1	7.11	1801	89	medium turbidity, clear to foggy, pumped dry
12/15/21	7:03	10.45	37.84	0.5	6.0	15.8	6.89	1452	na	high turbidity, light tan color
12/15/21	7:05		37.84	2.0	7.5	16.6	6.95	1324	76	medium turbidity, clear to foggy
12/15/21	7:07	dry	37.84	5.1	10.6	16.70	6.8	1355	na	high turbidity, light tan color, pumped dry
									na	
12/20/21	7:14	10.75	37.87	0.5	11.1	10.1	7.2	1310	na	high turbidity, light tan color
12/20/21	7:17		37.87	2.50	13.10	12.60	7.03	1289.00	0	low turbitity, no color
12/20/21	7:30	dry	37.87	7.00	17.60	12.10	7.03	1304.00	22	low turbitity, no color, pumped dry

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-111**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	BREC Wilson Station	Ground Surface Elevation (GS):	463.580
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	466.060
Well Information		**Borehole Volume Calculation:**	Filter Pack Porosity = 30%
Date Well Installed:	01/10/22	Water Column = 18.56 feet	Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft
Total Depth of Well:	98.31 feet from TOC	1 Well Volume = 3.03 gallons	
Depth to Top of Screen:	88.25 feet from TOC	1 well volume (gallons) = initial height of water column (ft) x .16	
Length of Casing Screened:	10.00 feet	Filter Pack Volume= 2.73 gallons	
Borehole Diameter:	4.75 inches	Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume	
Well Casing Diameter:	2.00 inches	3 Borehole Volume = **17.27 gallons**	
Type of Formation Screened:		3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)	

Development Method

Equipment:				Method Description:
Surge		**Bail**	**X**	A bailer was used to develop the well first few well volumes. Switched to a pump for the final two readings
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
01/12/22	11:22	79.75	98.31	0	0	18.3	6.96	n/a	n/a	Light brown, cloudy
01/12/22	11:31	79.75	98.31	2.5	2.5	15.5	6.80	n/a	n/a	Light brown, cloudy
01/12/22	11:50	79.75	98.31	2.5	5.0	15.9	6.74	n/a	n/a	Light brown, cloudy
01/12/22	11:58	79.75	98.31	2.5	7.5	15.8	6.74	n/a	n/a	Light brown, cloudy
01/12/22	12:06	79.75	98.31	2.5	10.0	16.1	6.75	n/a	n/a	Light brown, cloudy
01/12/22	12:17	79.75	98.31	2.5	12.5	17.9	6.73	n/a	n/a	Light brown, cloudy
01/12/22	12:23	79.75	98.31	10.0	22.5	18.3	6.76	n/a	n/a	light brown, slight clowdyness, switched to a pump, began clearing up
01/12/22	12:27	79.75	98.31	8.0	30.5	16.6	6.71	n/a	104	cloudy clear/white, cleared up, no draw down

*from TOC unless otherwise noted in Remarks

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-112**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	BREC Wilson Station	Ground Surface Elevation (GS):	403.820
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	401.150

Well Information		**Borehole Volume Calculation:**	
Date Well Installed:	01/08/22	Water Column =	35.61 feet
Total Depth of Well:	54.01 feet from TOC	1 Well Volume =	5.81 gallons
Depth to Top of Screen:	44.44 feet from TOC	1 well volume (gallons) = initial height of water column (ft) x .16	
Length of Casing Screened:	10.00 feet	Filter Pack Volume=	2.73 gallons
Borehole Diameter:	4.75 inches	Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume	
Well Casing Diameter:	2.00 inches	3 Borehole Volume =	**25.61 gallons**
Type of Formation Screened:		3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)	

Filter Pack Porosity = 30%

Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft

Development Method

Equipment:				Method Description:
Surge		**Bail**		A pump was used to develop the well by surging before pumping. The pump was set at a moderate pumping rate as to get readings before going dry.
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
01/07/22	3:26	18.40	54.01	0	0	10.8	7.15	1670	n/a	Cloudy, brown, high turbidty, surged
01/07/22	3:30	18.40	54.01	10.0	10.0	10.1	7.12	1244	105	cloudy, clearing up
01/07/22	3:33	18.40	54.01	7.5	17.5	9.6	7.08	1368	39.2	slight cloudyness, mostly clear
01/07/22	3:41	18.40	54.01	20.0	37.5	9.6	7.07	1355	16.5	clear, no cloudyness
01/07/22	3:43	18.40	54.01	5.0	42.5	10.7	7.05	1301	n/a	surged, let pump till clear again
01/07/22	3:48	18.40	54.01	12.5	55.0	9.4	7.08	1297	n/a	surged, let pump till clear again
01/07/22	3:50	18.40	54.01	5.0	60.0	9.0	7.1	1290	n/a	slight cloudyness, clear/white color

*from TOC unless otherwise noted in Remarks

091294 Form WCI OP6-1

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-113**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	Big Rivers Energy Company Wilson Station	Ground Surface Elevation (GS):	408.660
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	411.610

Well Information		
Date Well Installed:	12/12/21	
Total Depth of Well:	57.93	feet from TOC
Depth to Top of Screen:	47.72	feet from TOC
Length of Casing Screened:	10.00	feet
Borehole Diameter:	4.75	inches
Well Casing Diameter:	2.00	inches
Type of Formation Screened:		

Borehole Volume Calculation: Filter Pack Porosity = 30%

Water Column = 35.62 feet Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft

1 Well Volume = 5.81 gallons

1 well volume (gallons) = initial height of water column (ft) x .16

Filter Pack Volume= 2.73 gallons

Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume

3 Borehole Volume = **25.62 gallons**

3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)

Development Method

Equipment:				Method Description:
Surge		**Bail**		A pump was used to develop the well by surging before pumping. The pump was set at a moderate pumping rate as to get readings before going dry.
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
12/14/21	13:21	22.31	57.90	0.50	0.50	18.0	7.47	1287.00	na	high turbidity, tan/grey color
12/14/21	13:25		57.90	6.00	6.00	18.1	7.47	1132.00	na	high turbidity, tan/grey color
12/14/21	13:30	dry	57.90	12.2	12.2	18.3	7.42	938	na	high turbidity, tan/grey color, pumped dry
12/15/21	6:41	21.92	57.90	6.0	18.2	16.6	7.67	1080	na	high turbidity, tan/grey color, pumped dry
12/20/21	7:56	23.31	57.93	0.5	18.7	11.9	7.3	978	na	high turbidity, tan/grey color
12/20/21	8:02		57.93	6.5	24.7	13.70	7.5	835	11	low turbidity, some cloudyness
12/20/21	8:10	dry	57.93	13.50	31.7	13.20	7.4	850	26.0	low turbidity, some cloudyness, pumped dry

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-114**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	BREC Wilson Station	Ground Surface Elevation (GS):	401.460
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	404.180

Well Information		
Date Well Installed:	12/21/21	
Total Depth of Well:	50.32	feet from TOC
Depth to Top of Screen:	40.49	feet from TOC
Length of Casing Screened:	10.00	feet
Borehole Diameter:	4.75	inches
Well Casing Diameter:	2.00	inches
Type of Formation Screened:		

Borehole Volume Calculation: Filter Pack Porosity = 30%

Water Column = 37.38 feet Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft

1 Well Volume = 6.10 gallons

1 well volume (gallons) = initial height of water column (ft) x .16

Filter Pack Volume= 2.73 gallons

Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume

3 Borehole Volume = **26.48 gallons**

3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)

Development Method

Equipment:				Method Description:
Surge		**Bail**		A pump was used to develop the well by surging before pumping. The pump was set at a moderate pumping rate as to get readings before going dry.
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
01/05/22	11:42	12.94	50.32	0.00	0.00	15.4	7.54	3.11 ms	n/a	Surged, cloudy brown, high turbidity
01/05/22	11:45	30.50	50.32	3.00	3.0	16.6	7.35	1030	34.4	slight cloudyness, mostly clear
01/05/22	11:47	dry	50.32	10.00	10.0	14.8	7.43	1023	17.5	clear, pumped dry
01/05/22	12:43		50.32	0.00		15.1	7.35	1071	64.2	surged, some cloudyness, light brown
01/05/22	12:46		50.32	5.00	15.0	15.7	7.36	1046	62.9	some cloudyness, more clear/white color
01/05/22	12:50		50.32	10.00	20.0	16.5	7.18	975	38.9	slight cloudyness, clear/white color, pumped dry
01/05/22	1:53		50.32	0.00		14.3	7.36	920	6.6	surged, mostly clear, slight cloudyness
01/05/22	1:55		50.32	3.00	23.0	15.4	7.26	997	15.4	clear
01/05/22	1:58		50.32	10.00	30.0	16.0	7.23	955	15.2	clear, pumped dry

*from TOC unless otherwise noted in Remarks

091294 Form WCI OP6-1

WELL DEVELOPMENT RECORD

Project Name:	BREC Wilson GWAP	**Project Number:**	139081	**Well Number:**	**MW-10D**

Project Information		**Elevation of Monitoring Well**	
Facility Name:	BREC Wilson Station	Ground Surface Elevation (GS):	396.270
Location:	Centertown, Kentucky	Top of Casing Elevation (TOC):	399.000

Well Information			**Borehole Volume Calculation:**					
Date Well Installed:	01/11/22		Water Column =	64.19	feet	Filter Pack Porosity =	30%	
Total Depth of Well:	76.95	feet from TOC	1 Well Volume =	10.48	gallons	Filter Pack =	12.00 ft	Saturated Filter Pack = 12.00 ft
Depth to Top of Screen:	67.50	feet from TOC	1 well volume (gallons) = initial height of water column (ft) x .16					
Length of Casing Screened:	10.00	feet	Filter Pack Volume=	2.73	gallons			
Borehole Diameter:	4.75	inches	Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume					
Well Casing Diameter:	2.00	inches	3 Borehole Volume =	**39.61**	**gallons**			
Type of Formation Screened:			3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)					

Development Method

Equipment:				Method Description:
Surge		**Bail**		A pump was used to develop the well by surging before pumping. The pump was set at a moderate pumping rate as to get readings before going dry.
Airlift		**Pump**	**X**	

Observations During Development

Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed Gallons	Fluid Removed Total	Temp. (ºC)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
01/12/22	7:07	12.76	76.95	0	0	9.2	7.02	n/a	n/a	Brown, cloudy
01/12/22	7:09	12.76	76.95	5.0	5.0	11.0	6.90	n/a	n/a	light brown, cloudy
01/12/22	7:12	12.76	76.95	7.5	12.5	14.3	6.77	n/a	42	cleared up, surge
01/12/22	7:17	12.76	76.95	10.0	22.5	12.8	6.85	n/a	n/a	Brown, cloudy
01/12/22	7:19	12.76	76.95	5.0	27.5	11.3	6.82	n/a	n/a	light brown, cloudy
01/12/22	7:21	12.76	76.95	7.5	35.0	12.2	6.84	n/a	27.0	cleared up, surge
01/12/22	7:24	12.76	76.95	7.5	42.5	12.3	6.83	n/a	n/a	Brown, cloudy
01/12/22	7:26	12.76	76.95	5.0	47.5	11.8	6.81	n/a	n/a	light brown, cloudy
01/12/22	7:28	12.76	76.95	5.0	52.5	12.5	6.81	n/a	48.4	cleared up, slight cloudyness
01/12/22	7:31	12.76	76.95	7.5	60.0	12.8	6.80	n/a	25.6	cleared up

*from TOC unless otherwise noted in Remarks

APPENDIX L – MONITORING WELL SURVEY REPORT

ASSOCIATED ENGINEERS, INC.
ENGINEERS • GEOLOGISTS • SURVEYORS

Big Rivers Electric Corporation
DB Wilson Station

Monitoring Well Surveyed Locations
Surveyed January 12, 2022

Client: Burns & McDonnell Engineering Company, Inc.

Field Surveyor: M. Brandon Lynn
Licensed Surveyor: James D. Cansler, LPLS
Survey Method: GPS (RTK)
Equipment: Carlson BRX7
Control System: BREC DB Wilson Landfill Control (Local)
Primary Reference Point: P2-1

Associated Engineers, Inc. (AEI) has been retained by Burns & McDonnell Engineering Company for the purpose of surveying the location of six (6) new ground water monitoring wells at Big Rivers Electric Corporations' DB Wilson station. The location and elevation of the surface, well pad, and top of well casing were recorded at each location. The naming convention for the wells were provided to AEI by the client. Below is the tabulated location information for each well:

Well Number	MW-10D	MW-112	MW-111	MW-105R	MW-113	MW-114
Northing	411,074.72	411,508.31	412,729.54	409,931.19	409,807.60	409,619.33
Easting	1,611,069.73	1,608,411.52	1,608,677.75	1,608,917.21	1,612,111.55	1,615,071.09
Top of Casing Elev.	399.00	403.82	466.06	397.13	411.61	404.18
Top of Pad Elev.	396.48	401.26	463.75	394.37	408.89	401.68
Ground Elev.	396.27	401.15	463.58	394.11	408.66	401.46
Latitude	37°27'17.57"	37°27'21.48"	37°27'33.59"	37°27'05.96"	37°27'05.19"	37°27'03.74"
Longitude	087°05'23.66"	087°05'56.70"	087°05'53.62"	087°05'50.15"	087°05'10.52"	087°04'33.79"
HRMS*	0.0265	0.0222	0.0263	0.0272	0.0210	0.0206
VRMS**	0.0386	0.0328	0.0393	0.0429	0.0307	0.0318

***Horizontal Root-Mean-Square** (HRMS)

****Vertical Root-Mean-Square** (VRMS)

If there are any further questions feel free to contact me at 270-821-7732 jcansler@associatedengineers.com

James D. Cansler, LPLS
January 21, 2022

STATE OF KENTUCKY
JAMES D. CANSLER
3723
LICENSED PROFESSIONAL LAND SURVEYOR

BURNS McDONNELL

CREATE AMAZING.

Burns & McDonnell World Headquarters
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Kansas City, MO 64114
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APPENDIX C - ANALYTICAL SUMMARY TABLES

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-5

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																															
			4/4/2016		5/20/2016		8/25/2016		10/4/2016		2/15/2017		5/17/2017		8/16/2017		9/28/2017		10/12/2017		4/13/2018		7/12/2018		10/3/2018		6/30/2019		11/6/2019		4/22/2020		10/13/2020		5/13/2021		9/30/2021		4/27/2022		9/26/2022	
			Baseline Events																		Assessment		Re-sample		Assessment													
Boron			0.387	JB	0.282	JB	0.386	J	0.367	JB	0.839	J	0.981	JB	1.17		0.81	J	1.27				0.667	J	0.755	JB	ND	D2 U	ND	D2 U	0.66		0.69		0.68		0.70		0.75		0.73	M2
Calcium			673		472		509		464		471	B	514	B	480		493		480	B			504		471		670	D1	541	D1	600	D1	571	D1	662	D1	582	D1	614	D1	580	D1,M3
Chloride			49.3	B	60.2	JB	73.5		89.8		160	B	169	B	180		158	B	261				69.3	B	94.0	B	159	D	98.2	D	208	D	199	D	185	D	303	D	221		216	D,J+
Fluoride			ND	J	ND	J	ND		0.838		ND	J	ND	J	ND	JB	ND	J	2.88				ND	J	ND	J	ND	U	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U,M1,UR
Sulfate			1630		1950		1670	B	1570	B	1620		1530		2040	B	1860	B	1730	B			1520		1640	B	2060	D	1490	D	2820	D	1800	D	2010	D	2420	D	1710	D, J	1970	D
pH (Field Measurement)			6.59		6.34		7.17		6.93		5.94		6.92		6.77		6.46		7.18		6.67		6.13		6.25		6.39		6.44		6.71		5.95		6.38		6.19		6.20		4.76	
Total Dissolved Solids			2840		2960		2940		2930		3000		3100		3220		3090		3040				3210		3200		3440		3290		3460		3770		3790		3830		3480		3580	
APPENDIX IV CONSTITUENTS																																									
Antimony	0.006 mg/L	MCL	ND		ND		ND	J	ND	JB	ND		ND	JB	ND	JB	ND	J			ND	JB	ND	J	NA		ND	U	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U,M2,V1
Arsenic	0.0144 mg/L	Background	0.00524	J	0.00523		0.00577	B	ND	J	ND	J	ND	JB	ND	J	ND	J			ND	J	ND	J	ND	J	0.0025		0.0023		0.0025		0.0029		0.0027		0.0026		0.0026		0.0026	M2
Barium	2 mg/L	MCL	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.010		0.010		0.011		0.011		0.011		0.010		0.011		0.01	M2
Beryllium	0.004 mg/L	MCL	ND		ND	J	ND	J	ND	J	ND		ND	J	ND	J	ND				ND		NA		NA		ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U,M2,V1
Cadmium	0.005 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	U,M2
Chromium	0.1 mg/L	MCL	ND		ND	J	0.00309	B	ND	J	ND		ND	J	ND	J	ND				ND	J	ND		NA		ND	U	ND	U	<0.0020		<0.0020		0.0010	B, J	<0.0020		<0.0020	U	<0.0020	U,M2
Cobalt	0.009 mg/L	Background	0.00909	J	0.00829		0.00659		0.00664		0.00518		0.0057		ND	J	0.0051				0.00873		0.00672		0.00660		0.009		0.008		0.008		0.010		0.008		0.008		0.007		0.008	M2
Fluoride	4 mg/L	MCL	ND	J	ND	J	ND		0.838		ND	J	ND	J	ND	JB	ND	J			ND	J	ND	J	ND	J	ND	U	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U,M1,UR
Lead	0.015 mg/L	CCR Rule Value	ND		ND		ND	J	ND	JB	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		ND	U	ND	U	<0.002		<0.002		<0.002		<0.002		<0.002	U	<0.002	U,M2
Lithium	0.040 mg/L	CCR Rule Value	0.0243	J	0.0283	J	0.0374	J	0.0338	J	0.0432		0.042	J	0.0489	J	0.0398				0.0370	J	0.0375	J	0.0382	J	0.03		0.03		0.03		0.03		0.03		0.03		0.03		0.03		0.03	M2
Mercury	0.002 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U,M2, UJ
Molybdenum	0.1 mg/L	CCR Rule Value	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.004	J	0.004	J	0.004	J	0.004	J	0.003	J	0.004	J	0.003	J	0.004	M2,J
Radium 226 Radium 228	5 pCi/L	MCL	0.645		0.915		0.714		1.19		1.01		0.967		1.22		1.01				0.783		0.711		1.23		1.8		0.434		1.22		1.70		1.29		1.62		0.900	J	1.380	J
Selenium	0.05 mg/L	MCL	ND		ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND				ND	J	ND	J	NA		ND	U	ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U,M2
Thallium	0.002 mg/L	MCL	ND		ND	J	ND		ND	J	ND		ND	J	ND	J	ND				ND		ND		NA		ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U,M2

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit.
UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.
V1 = CCV recovery was above method acceptable limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-6

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																															
			4/5/2016		5/19/2016		8/25/2016		10/4/2016		2/15/2017		5/18/2017		8/16/2017		9/29/2017		10/12/2017		4/13/2018		7/12/2018		10/4/2018		6/30/2019		11/6/2019		4/22/2020		10/13/2020		5/13/2021		9/30/2021		4/27/2022		9/26/2022	
			Baseline Events																		Assessment		Re-sample		Assessment													
Boron			0.255	JB	0.243	JB	0.27	J	0.228	JB	0.293		0.265	JB	0.298	J	0.328	J	0.286	J			0.250	J	0.272	JB	ND	D2 U	ND	D2 U	0.31		0.34		0.43		0.51		0.52	M2	0.58	
Calcium			534		466		470		445		414	B	490	B	477		459		438	B			478	J	426		433	D1	482	D1	511	D1	483	D1	568	D1	473	D1	484	D1, M2	505	D1
Chloride			3.65	B	5.09	B	4.1	B	4.63		4.93		4.37	B	5.49	B	5.36	B	5.6				4.79	B	6.16	B	8.2		16.3		10.2		18.9		16.4		33.0	D	16.5		24.4	D
Fluoride			ND	J	ND	JB	ND		ND		ND	J	ND	J	ND	JB	ND	J	2.96				ND	J	ND	J	ND	U	ND	U	0.21		<0.20		0.20		<0.20		<0.20	U	<0.20	U
Sulfate			1560		1710		1660	B	1790	B	1610		1570		1840	B	1630	B	1670	B			1730		1590	B	2040	D	1280	D	2370	D1	1750	D	1730	D	2200	D	1470	D	1710	D
pH (Field Measurement)			6.40		6.26		6.56		6.64		6.09		6.35		6.36		6.29		6.4		6.15		6.07		6.08		6.39		6.29		6.21		6.72		7.22		6.13		6.44		4.76	
Total Dissolved Solids			2740		2780		2790		2800		2620		2820		2950		2900		2920				2920		3050		2700		3170		2750		3030		3020		3120		2790		2920	
APPENDIX IV CONSTIUENTS																																									
Antimony	0.006 mg/L	MCL	ND		ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	JB	ND	JB			ND	JB	ND	J	NA		ND	U	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U
Arsenic	0.0144 mg/L	Background	ND	J	0.00736		ND	JB	0.00534		0.0123		ND	B	0.00598		0.00632				ND	J	0.00683		0.00592		0.0046		0.0060		0.0050		0.0054		0.0047		0.0051		0.0046		0.0049	
Barium	2 mg/L	MCL	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.010		0.012		0.012		0.013		0.012		0.012		0.011		0.012	
Beryllium	0.004 mg/L	MCL	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U
Cadmium	0.005 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	U
Chromium	0.1 mg/L	MCL	ND		ND	J	ND	B	ND		ND		ND		ND		ND	J			ND	J	ND		NA		ND	U	ND	U	<0.0020		0.0007	J	0.0007	B, J	<0.0020		<0.0020	U	<0.0020	U
Cobalt	0.009 mg/L	Background	0.00728	J	0.00713		0.0074		0.00688		0.0054		0.0059		0.00578		0.00686				0.00742		0.00672		0.00666		0.008		0.008		0.009		0.009		0.008		0.008		0.008		0.008	
Fluoride	4 mg/L	MCL	ND	J	ND	J	ND		ND		ND	J	ND	J	ND	JB	ND	J			ND	J	ND	J	ND	J	ND	U	ND	U	0.21		<0.20		0.20		<0.20		<0.20	U	<0.20	U
Lead	0.015 mg/L	CCR Rule Value	ND		ND	J	ND	J	ND	JB	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		ND	U	0.0005	J	0.0005	J	0.0006	J	<0.002		<0.002		<0.002	U	<0.002	U
Lithium	0.040 mg/L	CCR Rule Value	0.0326	J	0.0419	J	0.0494	J	0.0459	J	0.0508		0.0455	J	0.0495	J	0.0472	J			0.0470	J	0.0496	J	0.0463	J	0.04		0.04		0.04		0.04		0.04		0.04		0.05		0.04	J-	0.04	
Mercury	0.002 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		0.000161	J F1			ND		NA		NA		ND	U	ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.006	J	0.007	J	0.006	J	0.007	J	0.006	J	0.007	J	0.006	J	0.007	J
Radium 226 Radium 228	5 pCi/L	MCL	0.596		0.581		0.519		0.847		0.919		0.892		0.82		0.639				0.900		0.795		1.44		0.8		1.42		0.804		0.568		0.758		0.610		1.49		0.84	J
Selenium	0.05 mg/L	MCL	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		ND		NA		ND	U	ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U
Thallium	0.002 mg/L	MCL	ND		ND	J	ND	J	ND	J	ND		ND		ND		ND	J			ND	J	ND		NA		ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J- = Potential low bias
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-7

| APPENDIX III CONSTITUENTS | GWPS | GWPS MCL/CCR Rule Value or Background Concentration | DATE | | |

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-8

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																															
			4/4/2016		5/19/2016		8/25/2016		10/3/2016		2/15/2017		5/17/2017		8/15/2017		9/28/2017		10/12/2017		4/13/2018		7/12/2018		10/3/2018		6/30/2019		11/5/2019		4/22/2020		10/13/2020		5/13/2021		9/30/2021		4/27/2022		9/26/2022	
			Baseline Events																		Assessment		Re-sample		Assessment													
Boron			ND	JB	ND	JB	ND	J	ND	JB	ND	J	ND	JB	ND	J	ND	J	ND	J			ND	J	0.0388	JB	ND	D2 U	ND	D2 M2 U	<0.10		<0.10		<0.10		<0.10		<0.10	U	<0.10	U
Calcium			329		242		237		226		213	B	225	B	230		214		216	B			245		207		248	D1	240	D1 M3	255	D1	249	D1	349	D1	231	D1	239	D1	228	D1
Chloride			4.12	B	5.48	B	4.38	B	4.69		4.7		4.19	B	4.68	B	4.82	B	4.44				3.83	B	4.80	B	4.1		4.7		3.6		3.7		3.8		3.9	M2	3.7		3.7	H2
Fluoride			ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	JB	ND	J	1.210				ND	J	ND	J	0.2		0.27		0.27		0.23		0.30		0.28	M2	0.25		<1.00	D,U
Sulfate			876		910		872	B	854	B	779	B	877		964	B	900	B	894	B			887		799	B	920	D	1480	D	1010	D	992	D	980	D	2180	D, M2. Y2	1330	D	935	D1
pH (Field Measurement)			6.47		6.34		6.64		6.63		4.91		6.47		6.44		6.35		6.50		6.28		6.08		6.25		6.30		6.30		6.18		6.55		6.84		6.35		6.28		4.67	
Total Dissolved Solids			1530		1590		1550		1520		1450		1560		1590		1520		1560				1690		1560		1640		1570		1500		1680		1750		1630		1470		1420	
APPENDIX IV CONSTIUENTS																																									
Antimony	0.006 mg/L	MCL	ND		ND		ND	J	ND	JB	ND		ND	JB	ND	JB	ND	J			ND	JB	ND	J	NA		ND	U	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U
Arsenic	0.0144 mg/L	Background	0.00931	J	0.00698		0.00709	B	0.00581		0.00799		0.0072	B	0.00548		0.00515				0.00525		0.00558		0.00757		0.0054		0.0056		0.0056		0.0144		0.0052		0.0053		0.0102		0.0053	
Barium	2 mg/L	MCL	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.024		0.022		0.024		0.070		0.023		0.023		0.050		0.022	
Beryllium	0.004 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	M2 U	<0.0020		<0.0020		<0.0020		<0.0020		0.0020	U	<0.0020	U
Cadmium	0.005 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0010		0.0004	J	<0.0010		<0.0010		0.0003	J	<0.0010	U
Chromium	0.1 mg/L	MCL	ND		ND	J	ND	JB	ND		ND		ND		ND		ND				ND	J	ND	J	NA		ND	U	0.0009	J	0.0008	J	0.0224		0.0011	B, J	0.0018	J	0.0155		0.0015	J
Cobalt	0.009 mg/L	Background	ND		0.00156	J	0.00118	J	0.0015	J	0.0011	J	0.000739	J	0.000943	J	0.00102	J			0.000800	J	0.00113	J	0.000849	J	ND	U	ND	U	<0.004		0.015		<0.004		<0.004		0.009		<0.004	U
Fluoride	4 mg/L	MCL	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	JB	ND	J			ND	J	ND	J	ND	J	0.2		0.27		0.27		0.23		0.30		0.28	M2	0.25		<1.00	D,U
Lead	0.015 mg/L	CCR Rule Value	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND	U	0.0005	J	<0.002		0.012		<0.002		0.0008	J	0.007		0.0007	J
Lithium	0.040 mg/L	CCR Rule Value	ND		ND		0.0116	J	0.012	J	0.0142	J	0.0103	J	0.0137	J	ND				ND		0.0125	J	0.0129	J	0.009	J	0.009	J	0.009	J	0.02		0.008	J	0.01	V1, J	0.02		0.01	J
Mercury	0.002 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	0.0187	J	0.0142		0.0145		0.0151		0.0185		0.0137		0.0166		0.0153				0.0123		0.0129		0.0137		0.01		0.01		0.01		0.01		0.01		0.01		0.01		0.01	
Radium 226 Radium 228	5 pCi/L	MCL	1.12		1.31		0.741		1.12		0.854		1.07		1.04		0.901				0.802		1.29		1.69		2.8		0.946		1.07		2.94		0.968		0.859		1.52		1.67	J
Selenium	0.05 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND	J	ND				ND		ND	J	NA		ND	U	ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U
Thallium	0.002 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND	U	0.0001	J	<0.0020		<0.0020		<0.0020		<0.0020		0.0001	J	<0.0020	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
H2 = Initial analysis within holding time. Reanalysis was past holding time.
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-10

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																															
			4/5/2016		5/18/2016		8/25/2016		10/6/2016		2/17/2017		5/18/2017		8/18/2017		10/2/2017		10/13/2017		4/14/2018		7/13/2018		10/5/2018		6/30/2019		11/4/2019		4/22/2020		10/13/2020		5/13/2021		10/1/2021		4/27/22022		9/27/2022	
			Baseline Events																		Assessment		Re-sample								Assessment							
Boron			0.291	JB	0.217	JB	0.205	J	0.166	JB	0.229	J	0.163	JB	0.196	J	0.181	J	0.251	J			0.144	J	0.286	JB	ND	D2 U	ND	U D2	0.28		0.39		0.31		0.70		0.43		0.60	
Calcium			497		390		404		369		440	B	390	B	368		379	B	347	B			378	J	334		369	D1	409	D1	415	D1	404	D1	401	D1	396	D1	391	D1	483	D1
Chloride			53.7	B	85.7	JB	53		44	B	44	B	47.4	B	43.5	B	63.3		83				48.2	B	59.2	B	80.1	D	143	D	68.6	D	89.2	D	73.2	D	98.8	D	57.9		61.1	
Fluoride			ND	JB	ND	J	ND		ND	J	ND	J	ND	J	ND	JB	ND	J	2.8				ND	J	ND	J	ND	U	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U
Sulfate			2090		2210		2000	B	2030		1980	B	2070		2320	B	2250	B	2080	B			2010		1850	B	2440	D	553	D	3580	D	1380	D	1240	D	1360	D	1420	D	2660	D1
pH (Field Measurement)			6.03		5.82		6.05		6.91		4.62		5.88		5.83		5.84		6.00		5.90		5.68		5.44		6.01		5.53		6.26		6.16		6.59		5.84		6.25		6.1	
Total Dissolved Solids			2980		3300		3240		3230		3050		3240		3200		3300		3120				3270		3120		2980		2960		3170		3290		3300		3310		3160		3220	
APPENDIX IV CONSTIUENTS																																									
Antimony	0.006 mg/L	MCL	ND		ND		ND	J	ND	JB	ND		ND	JB	0.00396	B	ND	JB			ND	JB	ND	J	NA		ND	U	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U,V1
Arsenic	0.0144 mg/L	Background	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	JB	ND	J	ND	JB			ND	J	ND	J	ND	J	0.0009	J	0.0025		0.0011		0.0009	J	0.0013		0.0036		0.0009	J	0.0034	
Barium	2 mg/L	MCL	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.009		0.01		0.008		0.010		0.010		0.009		0.004		0.010	
Beryllium	0.004 mg/L	MCL	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U,V1
Cadmium	0.005 mg/L	MCL	ND		ND		ND		ND		ND	J	ND	J	ND		ND				ND		NA		NA		0.0001	J	ND	U	<0.0010		<0.0010		<0.0010		<0.0010		0.0001	J	<0.0010	U
Chromium	0.1 mg/L	MCL	ND		ND	J	ND	JB	ND		ND		ND		ND		ND	J			ND	J	ND		NA		ND	U	ND	U	<0.0020		0.0007	J	0.0010	B, J	<0.0020		0.0008	J	0.0006	J
Cobalt	0.009 mg/L	Background	0.158		0.113		0.126		0.108		0.0836		0.0602		0.121		0.139				0.0412		0.0704		0.114		0.110		0.108		0.082		0.078		0.064		0.092		0.022		0.108	
Fluoride	4 mg/L	MCL	ND	J	ND	J	ND		ND	J	ND	J	ND	J	ND	JB	ND	J			ND	J	ND	J	ND	J	ND	U	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U
Lead	0.015 mg/L	CCR Rule Value	ND		ND	J	ND	J	ND	J	ND	J	ND		ND		ND	J			ND	J	ND	J	NA		ND	U	ND	U	<0.002		<0.002		<0.002		<0.002		<0.002	U	<0.002	U
Lithium	0.040 mg/L	CCR Rule Value	ND		ND		0.0141	J	0.0149	J	0.0133	J	0.0109	J	0.0129	J	0.0124	J			ND		0.0102	J	0.0147	J	0.009	J	ND	U	0.006	J	0.008	J	0.006	J	0.008	J	0.006	J	0.009	V1,J
Mercury	0.002 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	ND		ND		ND		ND		ND		ND		ND	J	ND				ND		ND		ND		ND	U	0.003	J	<0.01		<0.01		<0.01		<0.01		<0.01	U	<0.01	U
Radium 226 Radium 228	5 pCi/L	MCL	ND		ND		ND		ND		ND		0.384		0.372		0.506				0.721		0.472		0.625		1.2		0.11		0.414		0.944		1.40		0.378		0.924	J	2.5	J
Selenium	0.05 mg/L	MCL	ND		ND		ND		ND		ND		ND		ND	J	ND	JB			ND		ND		NA		ND	U	ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U
Thallium	0.002 mg/L	MCL	ND		ND	J	ND	J	ND		ND		ND		ND	J	ND				ND		ND		NA		ND	U	0.0001	J	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptable limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-4D

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																	
			11/2/2018		6/28/2019		11/8/2019		4/22/2020		10/13/2020		5/12/2021		9/29/2021		4/27/2022		9/27/2022	
			Characterization																	
Boron			6.60		8.09	D2	9.11	D2	10.2	D1	9.39	D1	9.29	D1	8.69	D1. M1	10.3	D1	11.3	D1
Calcium			607		635	D1	628	D1	714	D1	659	D1	711	D1	608	D1, M3	678	D1	740	D1
Chloride			676	B	826	D	537	D	1280.0	D	1210	D	819	D	1570	D	1110	D	781	D
Fluoride			ND	J	ND	DU	0.21		0.26		0.23		0.26		0.26		<0.20	U	<0.20	U
Sulfate			1720	B	1330	D	1100	D	2650	D	1260	D	1670	D	985	D	2260		2380	D1
pH (Field Measurement)			6.05		6.46		6.34		6.31		6.47		6.22		6.28		7.34		6.59	
Total Dissolved Solids			4180		4140		3500		4690		4410		4670		4580	C6	4210		4100	
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	MCL	ND	JB	ND	U	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U
Arsenic	0.0144 mg/L	Background	ND	JB	0.0032		0.0032		0.0039		0.0037		0.0031		0.0029		0.003		0.0028	
Barium	2 mg/L	MCL	ND	J	0.016		0.016		0.016		0.018		0.016		0.013		0.015		0.015	
Beryllium	0.004 mg/L	MCL	ND	J	ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U
Cadmium	0.005 mg/L	MCL	ND		ND	U	ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	U
Chromium	0.1 mg/L	MCL	0.00591	B	0.0006	J	ND	U	<0.0020		0.0010	J	0.0009	B, J	<0.0020		0.0013	J	<0.0020	U
Cobalt	0.009 mg/L	Background	0.0122		0.010		0.015		0.010		0.012		0.009		0.010		0.009		0.011	
Fluoride	4 mg/L	MCL	ND	J	ND	DU	0.21		0.26		0.23		0.26		0.26		<0.20	U	<0.20	U
Lead	0.015 mg/L	CCR Rule Value	ND	J	ND	U	ND	U	<0.002		0.0005	J	<0.002		<0.002		<0.002	U	<0.002	U
Lithium	0.040 mg/L	CCR Rule Value	0.181		0.14		0.14		0.16		0.17		0.16		0.13	M1	0.18		0.17	
Mercury	0.002 mg/L	MCL	ND		ND	U	ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	0.0185		0.007	J	0.01		0.02		0.01		0.006	J	0.007	J	0.007	J	0.007	J
Radium 226 Radium 228	5 pCi/L	MCL	1.58		2.7		1.86		0.851		1.71		1.07		1.05		1.07	J	1.83	J
Selenium	0.05 mg/L	MCL	ND	J	0.001	J	0.001	J	0.001	J	<0.003		0.001	J	0.001	J	0.001	J	0.001	J
Thallium	0.002 mg/L	MCL	ND	J	ND	U	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-102

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																			
			11/2/2018		6/27/2019		11/8/2019		4/22/2020		10/13/2020		5/12/2021		9/29/2021		4/28/2022		9/29/2022	
			Characterization																	
Boron			ND	J	0.108	JB	ND	D2 M4 U	<0.10		<0.10		<0.10		<0.10		<0.10	M1,M2,J+	<0.10	U
Calcium			81.3		80.9		85.1	D2	94.5	D1	86.8	D2	82.8	D	84.1	D1	88.4	M1,D1	97.8	D1
Chloride			33.3	B	33.3		35.3		33.1		32.9	D2	39.7	D	36.2	M2	34.2		31.8	H2
Fluoride			ND	J	0.343		0.36		0.34		0.30		0.33		0.33		0.29		0.29	
Sulfate			265	B	279		307	D	259	D	261	D	308	D	433	D, M2	245	D	302	H2
pH (Field Measurement)			6.58		6.7		6.61		6.48		6.33		6.49		6.58		6.59		6.67	
Total Dissolved Solids			781		760		728		724		836		734		818		792		1040	
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	MCL	ND	JB	0.000101	JB	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U
Arsenic	0.0144 mg/L	Background	ND	JB	0.00414	J	0.0031		0.0047		0.0036		0.0038		0.0042		0.0042		0.0038	
Barium	2 mg/L	MCL	ND	J	0.0596	JB	0.059		0.051		0.058		0.053		0.049		0.047		0.046	
Beryllium	0.004 mg/L	MCL	ND		0.000134	J	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U, V1
Cadmium	0.005 mg/L	MCL	ND		ND		ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	U
Chromium	0.1 mg/L	MCL	0.00321	B	0.00140	JB	0.0006	J	<0.0020		<0.0020		0.0011	B, J	<0.0020		<0.002	U	<0.002	U
Cobalt	0.009 mg/L	Background	0.00263	J	0.00286	JB	ND	U	<0.004		<0.004		<0.004		<0.004		<0.004	U	<0.004	U
Fluoride	4 mg/L	MCL	ND	J	0.343		0.36		0.34		0.30		0.33		0.33		0.29		0.29	
Lead	0.015 mg/L	CCR Rule Value	ND	J	0.000164	J	ND	U	<0.002		<0.002		<0.002		<0.002		<0.002	U	<0.002	U
Lithium	0.040 mg/L	CCR Rule Value	ND		ND		ND	U	<0.02		<0.02		<0.02		<0.02		<0.02	U	<0.02	U, V1
Mercury	0.002 mg/L	MCL	ND		ND		ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	0.0111		0.00112	J	0.002	J	<0.01		<0.01		<0.01		<0.01		<0.01	U	<0.01	U
Radium 226 Radium 228	5 pCi/L	MCL	1.22		0.187	U	0.425		0.084		0.741		0.497		0.899		1.14	J	0.652	J
Selenium	0.05 mg/L	MCL	ND		ND		ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U
Thallium	0.002 mg/L	MCL	ND		ND		ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	V1,U	<0.0020	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J+ = Potential high bias
B = Compound was found in the blank and sample.
H2 = Initial analysis within holding time. Reanalysis was past holding time.
HF = Hold time exceedance
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-104

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																	
			11/2/2018		6/27/2019		11/8/2019		4/22/2020		10/13/2020		5/12/2021		9/29/2021		4/28/2022		9/30/2022	
			Characterization																	
Boron			ND	J	0.0765	JB	ND	U D2	<0.10		<0.10		<0.10		<0.10		<0.10	U	<0.10	M2,U
Calcium			227		221		257	D1	258	D1	267	D1	273	D	271	D1	312	D1	426	D1,M3
Chloride			11.8	B	12.7		13.2		13.0		11.4		13.5		12.1		12.2		10.8	
Fluoride			ND	J	0.129	J	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U
Sulfate			639	JB	513		587	D M1	662	D	628	D	690	D	1290	D	630	U	1070	
pH (Field Measurement)			6.43		6.87		6.64		6.50		6.41		6.44		6.51		6.24		6.77	
Total Dissolved Solids			1410		1360		1490		1380		1590		1460		1610		1550		1640	
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	MCL	ND	JB	0.000173	JB	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	UJ
Arsenic	0.0144 mg/L	Background	ND	JB	0.00174	J	0.0027		0.0010		0.0006	J	0.0005	J	0.0007	J	0.0004	J	0.0006	M2, J
Barium	2 mg/L	MCL	ND	J	0.0734	JB	0.064		0.050		0.047		0.035		0.034		0.031		0.034	M2,J-
Beryllium	0.004 mg/L	MCL	ND	J	0.000142	J	ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	UJ
Cadmium	0.005 mg/L	MCL	ND		ND		ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	M2,UJ
Chromium	0.1 mg/L	MCL	0.00361	B	0.0178	B	0.0037		0.0007	J	<0.0020		0.0010	B, J	<0.0020		<0.0020	U	<0.0020	M2,U
Cobalt	0.009 mg/L	Background	0.00388	J	0.00164	JB	ND	U	<0.004		<0.004		<0.004		<0.004		<0.004	U	<0.004	M2,U
Fluoride	4 mg/L	MCL	ND	J	0.129	J	ND	U	<0.20		<0.20		<0.20		<0.20		<0.20	U	<0.20	U
Lead	0.015 mg/L	CCR Rule Value	ND	J	0.000785	J	0.002		<0.002		<0.002		<0.002		<0.002		<0.002	U	<0.002	M2,UJ
Lithium	0.040 mg/L	CCR Rule Value	0.0326	J	0.0261	J	0.03		0.02		0.03		0.02		0.02		0.02		0.02	M2,J-
Mercury	0.002 mg/L	MCL	ND		ND		ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.1 mg/L	CCR Rule Value	0.0124		0.00319	J	ND	U	0.003	J	<0.01		<0.01		<0.01		<0.01	U	<0.01	M2,U
Radium 226 Radium 228	5 pCi/L	MCL	2.16		0.952		1.24		0.823		1.88		1.15		1.78		1.32	J	1.83	J
Selenium	0.05 mg/L	MCL	ND		ND		ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	M2,U
Thallium	0.002 mg/L	MCL	ND		ND		ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	M2,UJ

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J- = Qualified as estimated potential low bias during data review.
B = Compound was found in the blank and sample.
U = Target analyte was analyzed for, but was below detection limit
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-105

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																	
			11/2/2018		6/27/2019		11/7/2019		4/22/2020		10/13/2020		5/12/2021		9/29/2021		4/28/2022	
			Characterization															
Boron			ND	J	0.348	JB	ND	D2 M4 U	0.33		0.37		0.36		0.34			
Calcium			124		58.6		72.0	D2 M1	60.4	D1	49.2	D2	59.7	D1	59.4	D1		
Chloride			10.5	B	9.34		10.1		9.5		8.7		9.0		9.1			
Fluoride			ND	J	0.638		0.55		0.67		0.61		0.60		0.61			
Sulfate			216	JB	37.6		73.7	D	91.8	D	75.4	D	157	D	176	D		
pH (Field Measurement)			6.75		7.70		7.51		7.78		8.02		7.21		7.27			WELL ABANDONED
Total Dissolved Solids			747		548		612		398		550		644		626			
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	ND	JB	0.000186	JB	ND	U	<0.005		<0.005		<0.005		<0.005			
Arsenic	0.0144 mg/L	Background	ND	JB	0.00186	J	ND	U	<0.0010		<0.0010		<0.0010		<0.0010			
Barium	2 mg/L	MCL	0.207		0.288	B	0.326		0.255		0.256		0.267		0.260			
Beryllium	0.004 mg/L	MCL	ND	J	0.000398	J	ND	U	<0.0020		<0.0020		<0.0020		<0.0020			
Cadmium	0.005 mg/L	MCL	ND		ND		ND	U	<0.0010		<0.0010		<0.0010		<0.0010			
Chromium	0.1 mg/L	MCL	0.00388	B	0.00784	B	ND	U	<0.0020		<0.0020		0.0011	B, J	<0.0020			
Cobalt	0.009 mg/L	Background	0.00488	J	0.00435	JB	ND	U	<0.004		<0.004		<0.004		<0.004			
Fluoride	4 mg/L	MCL	ND	J	0.638		0.55		0.67		0.61		0.60		0.61			
Lead	0.015 mg/L	CCR Rule Value	ND	J	0.00326	J	ND	U	<0.002		<0.002		<0.002		<0.002			
Lithium	0.040 mg/L	CCR Rule Value	0.0141	J	0.0278	J	0.03	M1	0.02		0.02		0.02		0.02			
Mercury	0.002 mg/L	MCL	ND		ND		ND	U	<0.0005		<0.0005		<0.0005		<0.0005			
Molybdenum	0.1 mg/L	CCR Rule Value	0.0131		0.00231	J	0.002	J	0.002	J	0.002	J	0.002	J	0.002	J		
Radium 226	5 pCi/L	MCL	1.08		0.558	U	0.829		1.15		1.30		2.14		0.380			
Radium 228																		
Selenium	0.05 mg/L	MCL	ND		ND		ND	U	<0.003		<0.003		<0.003		<0.003			
Thallium	0.002 mg/L	MCL	ND		0.0000510	J	ND	U	<0.0020		<0.0020		<0.0020		<0.0020			

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-105R

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE															
			4/28/2022		9/29/2022													
			Characterization															
Boron			<0.10	U	<0.10	U												
Calcium			214	D1	204	D1												
Chloride			12.2	J+	11.5													
Fluoride			<0.20	U	<0.20	UJ												
Sulfate			439	D, M1, J+	410.0	D												
pH (Field Measurement)			6.38		6.71	J-												
Total Dissolved Solids			1800		1010													
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	<0.005	U	<0.005	U,V1												
Arsenic	0.0144 mg/L	Background	0.0016		0.0011													
Barium	2 mg/L	MCL	0.033		0.032													
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U,V1												
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U												
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U												
Cobalt	0.009 mg/L	Background	<0.004	U	<0.004	U												
Fluoride	4 mg/L	MCL	<0.20	U	<0.20	U												
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U												
Lithium	0.040 mg/L	CCR Rule Value	0.03		0.03													
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	U												
Molybdenum	0.1 mg/L	CCR Rule Value	0.005	J	0.002	J												
Radium 226 Radium 228	5 pCi/L	MCL	1.86	J	1.35	J												
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U												
Thallium	0.002 mg/L	MCL	0.0001	V1,J	<0.0020	U												

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J+ = Potential high bias
J- = Qualified as estimated potential low bias during data review.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit
UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-110

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																	
			11/2/2018		6/27/2019		11/7/2019		4/22/2020		10/13/2020		5/12/2021		9/29/2021		4/28/2022		9/28/2022	
			Characterization																	
Boron			ND	J	0.0716	JB	ND	U D2	<0.10		<0.10		<0.10		<0.10		<0.10	U	<0.10	U
Calcium			33.8		38.9		47.6	D2	39.9	D1	37.9	D2	39.7	D1	33.8	D1	40.7	D1	38.3	D1
Chloride			14.4	B	11.1		10.0		11.5		10.5		11.2		10.9		11.4		9.7	
Fluoride			ND	J	0.229		0.23		0.28		0.24		0.26		0.27		0.23		0.24	
Sulfate			102	B	70.0		61.2	D	71.7	D	56	D	75.2	D	101	D	94.6	D	68.4	
pH (Field Measurement)			6.93		6.92		6.83		6.89		6.87		6.43		6.88		6.19		6.65	
Total Dissolved Solids			333		296		348		208		278		302		260		2590		270	
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	MCL	ND	JB	0.000130	JB	ND	U	<0.005		<0.005		<0.005		<0.005		<0.005	U	<0.005	U,V1
Arsenic	0.0144 mg/L	Background	ND	JB	0.00118	J	ND	U	0.0019		0.0011		0.0010		0.0018		0.0029		0.0015	
Barium	2 mg/L	MCL	ND	J	0.0535	JB	0.051		0.051		0.053		0.054		0.046		0.057		0.050	
Beryllium	0.004 mg/L	MCL	ND		ND		ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.0020	U	<0.0020	U,V1
Cadmium	0.005 mg/L	MCL	ND		ND		ND	U	<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	U	<0.0010	U
Chromium	0.1 mg/L	MCL	0.00967	B	0.00217	JB	ND	U	0.0007	J	<0.0020		0.0009	B,J	<0.0020		<0.0020	U	<0.0020	U
Cobalt	0.009 mg/L	Background	0.00240	J	0.000827	JB	ND	U	<0.004		<0.004		<0.004		<0.004		<0.004	U	<0.004	U
Fluoride	4 mg/L	MCL	ND	J	0.229		0.23		0.28		0.24		0.26		0.27		0.23		0.24	
Lead	0.015 mg/L	CCR Rule Value	ND	J	0.000539	J	ND	U	<0.002		<0.002		<0.002		<0.002		<0.002	U	<0.002	U
Lithium	0.040 mg/L	CCR Rule Value	0.0122	J	ND		0.006	J	<0.02		<0.02		<0.02		<0.02		<0.02	U	<0.02	V1,U
Mercury	0.002 mg/L	MCL	ND		ND		ND	U	<0.0005		<0.0005		<0.0005		<0.0005		<0.0005	U	<0.0005	U
Molybdenum	0.002 mg/L	CCR Rule Value	ND	J	ND		ND	U	<0.01		<0.01		<0.01		<0.01		<0.01	U	<0.01	U
Radium 226 Radium 228	5 pCi/L	MCL	1.19		0.816		1.10		1.53		1.49		1.37		1.36		0.594	J	1.69	J
Selenium	0.05 mg/L	MCL	ND		ND		ND	U	<0.003		<0.003		<0.003		<0.003		<0.003	U	<0.003	U
Thallium	0.002 mg/L	MCL	ND		ND		ND	U	<0.0020		<0.0020		<0.0020		<0.0020		<0.002	V1,U	<0.002	U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-10D

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE															
			4/27/2022		9/27/2022													
			Characterization															
Boron			3.16	D2	3.11	D1												
Calcium			482	D1	548	D1												
Chloride			145	D	195	D												
Fluoride			0.41		0.35													
Sulfate			1150	D	1920.0	D1												
pH (Field Measurement)			7.11		6.67													
Total Dissolved Solids			1070		2660													
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	<0.005	U	<0.005	U												
Arsenic	0.0144 mg/L	Background	0.0029		0.0036													
Barium	2 mg/L	MCL	0.016		0.018													
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U,V1												
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U												
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U												
Cobalt	0.009 mg/L	Background	0.005		<0.0040	U												
Fluoride	4 mg/L	MCL	0.41		0.35													
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U												
Lithium	0.040 mg/L	CCR Rule Value	0.07		0.07													
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	U												
Molybdenum	0.1 mg/L	CCR Rule Value	0.009	J	0.004	J												
Radium 226 Radium 228	5 pCi/L	MCL	1.63		1.39	J												
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U												
Thallium	0.002 mg/L	MCL	<0.0020	U	<0.0020	U												

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
D2 = Sample required dilution due to matrix interference
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-111

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE															
			4/28/2022		9/30/2022													
			Characterization															
Boron			0.23		0.22													
Calcium			627	D1	637	D1												
Chloride			3.8		3.7	M2,J-												
Fluoride			<0.20	U	0.24	M2,J-												
Sulfate			1800	D, H2	2640	D,M2												
pH (Field Measurement)			6.43		6.59													
Total Dissolved Solids			304		3300													
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	<0.005	U	<0.005	V1,U												
Arsenic	0.0144 mg/L	Background	0.0027		0.0026													
Barium	2 mg/L	MCL	0.021		0.019													
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U												
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U												
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U												
Cobalt	0.009 mg/L	Background	0.01100		0.011000													
Fluoride	4 mg/L	MCL	<0.20	U	0.24	M2,J-												
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U												
Lithium	0.040 mg/L	CCR Rule Value	0.04		0.03													
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	UJ												
Molybdenum	0.1 mg/L	CCR Rule Value	0.003	J	0.003	J												
Radium 226	5 pCi/L	MCL	1.51	J	1.65	J												
Radium 228																		
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U												
Thallium	0.002 mg/L	MCL	0.0001	V1,U	0.0001	U												

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J- = Qualified as estimated potential low bias during data review.
H2 = Initial analysis within holding time. Reanalysis was past holding time.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
H2 = Initial analysis within holding time. Reanalysis was past holding time.
M2 = Matrix spike recovery was low; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit
UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-112

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE															
			4/28/2022		9/30/2022													
			Assessment															
Boron			0.15		0.15													
Calcium			250	D1	283	D1												
Chloride			51.7		3.6	H2												
Fluoride			<0.20	U	<0.20	U												
Sulfate			512	D	602	D												
pH (Field Measurement)			6.35		6.82													
Total Dissolved Solids			1040	J-, H2	1180													
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	<0.005	U	<0.005	U,V1												
Arsenic	0.0144 mg/L	Background	0.0013		0.0019													
Barium	2 mg/L	MCL	0.028		0.032													
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U,V1												
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U												
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U												
Cobalt	0.009 mg/L	Background	0.004		0.005													
Fluoride	4 mg/L	MCL	<0.20	U	<0.20	U												
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U												
Lithium	0.040 mg/L	CCR Rule Value	0.01	J	0.01	V1,J												
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	U												
Molybdenum	0.1 mg/L	CCR Rule Value	0.002	J	0.002	J												
Radium 226 Radium 228	5 pCi/L	MCL	0.173	J	1.22	J												
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U												
Thallium	0.002 mg/L	MCL	<0.0020	V1, U	<0.0020	U												

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
H2 Initial analysis within holding time. Reanalysis was past holding time.
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
J- = Potential low bias
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
H2 = Initial analysis within holding time. Reanalysis was past holding time.
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-113

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE															
			4/28/2022		9/28/2022													
			Characterization															
Boron			<0.10	U	<0.10	U												
Calcium			206	D1	256	D1												
Chloride			35.0		37.6													
Fluoride			0.22		<0.2	U												
Sulfate			557	D, M1	1070.0	D												
pH (Field Measurement)			6.17		6.62													
Total Dissolved Solids			1200		1660													
APPENDIX IV CONSTITUENTS																		
Antimony	0.006 mg/L	MCL	0.002	J	<0.005	U												
Arsenic	0.0144 mg/L	Background	0.0116		0.0229													
Barium	2 mg/L	MCL	0.053		0.029													
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U,V1												
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U												
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U												
Cobalt	0.009 mg/L	Background	0.037		0.018													
Fluoride	4 mg/L	MCL	0.22		<0.2	U												
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U												
Lithium	0.040 mg/L	CCR Rule Value	0.04		0.03													
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	U												
Molybdenum	0.1 mg/L	CCR Rule Value	0.02		0.007	J												
Radium 226	5 pCi/L	MCL	0.976	J	0.969	J												
Radium 228																		
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U												
Thallium	0.002 mg/L	MCL	<0.02	V1,U	<0.02	U												

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
M1 = Matrix spike recovery was high; the method control sample recovery was acceptable.
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

WILSON LANDFILL - CCR ANALYTICAL SUMMARY
MW-114

APPENDIX III CONSTITUENTS	GWPS	GWPS MCL/CCR Rule Value or Background Concentration	DATE																	
			4/28/2022		9/28/2022															
			Characterization																	
Boron			<0.10	U	<0.10	U														
Calcium			115	D1	130	D1														
Chloride			40.0		31.6															
Fluoride			0.22		0.22															
Sulfate			138	D	151.0															
pH (Field Measurement)			6.69		6.71															
Total Dissolved Solids			1510		864															
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	MCL	<0.005	U	<0.005	U,V1														
Arsenic	0.0144 mg/L	Background	0.0025		0.0048															
Barium	2 mg/L	MCL	0.067		0.062															
Beryllium	0.004 mg/L	MCL	<0.0020	U	<0.0020	U,V1														
Cadmium	0.005 mg/L	MCL	<0.0010	U	<0.0010	U														
Chromium	0.1 mg/L	MCL	<0.0020	U	<0.0020	U														
Cobalt	0.009 mg/L	Background	<0.004	U	<0.004	U														
Fluoride	4 mg/L	MCL	0.22		0.22															
Lead	0.015 mg/L	CCR Rule Value	<0.002	U	<0.002	U														
Lithium	0.040 mg/L	CCR Rule Value	0.02		0.02															
Mercury	0.002 mg/L	MCL	<0.0005	U	<0.0005	U														
Molybdenum	0.1 mg/L	CCR Rule Value	0.007	JU	0.004	J														
Radium 226 Radium 228	5 pCi/L	MCL	1.86	J	1.22	J														
Selenium	0.05 mg/L	MCL	<0.003	U	<0.003	U														
Thallium	0.002 mg/L	MCL	<0.002	V1,U	<0.002	U														

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Groundwater Protection Standard (GWPS).
CCR = Coal combustion residual
MCL = Maximum Contaminant Level
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
D = Results reported from dilution
D1 = Sample required dilution due to high concentration of target analyte
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

APPENDIX D – LABORATORY ANALYTICAL REPORTS

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030126

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:41

Project Name:	MW-5 Wilson 092-00004	Workorder:	2030126

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030126-01	MW5/	Groundwater	04/27/2022 08:10	04/27/2022 16:15	Travis Sneed

LabNumber	Measurement	Value
2030126-01	Field Conductance	4140
	Field pH	6.20
	Field Temp (C)	15.78

Pace Analytical Services, LLC
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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **2030126-01**
Description: **MW5**

Sample Collection Date Time: 04/27/2022 08:10
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Arsenic	**0.0026**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Boron	**0.75**		mg/L	0.10	0.10	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:55	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Calcium	**614**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:01	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Cobalt	**0.007**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Iron	**7.00**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:55	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/06/2022 14:40	NKP
Magnesium	**255**	D1, L2	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:01	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Molybdenum	**0.003**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Nickel	**0.005**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Potassium	**10.9**	D1, L1	mg/L	10.0	4.40	SW846 6010 B	04/30/2022 10:00	05/18/2022 10:29	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Sodium	**95.2**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:01	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP
Zinc	**0.009**	J	mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:26	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**505**		mg/L	4		2320 B-2011	05/04/2022 13:16	05/04/2022 13:16	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 13:16	05/04/2022 13:16	HMF
Total Alkalinity	**505**		mg/L	4		2320 B-2011	05/04/2022 13:16	05/04/2022 13:16	HMF
Chemical Oxygen Demand	**33**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:12	KBZ
Specific Conductance (Lab)	**3830**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**2370**	D	mg/L	5	5	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
Total Dissolved Solids	**3480**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**2.1**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 20:41	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.048**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**0.852**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**0.900**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.900**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**221**		mg/L	10.0	7.2	EPA 300.0 REV 2.1	05/09/2022 23:23	05/09/2022 23:23	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 23:08	05/09/2022 23:08	CSC
Sulfate	**1710**	D	mg/L	200	100	EPA 300.0 REV 2.1	05/09/2022 23:39	05/09/2022 23:39	CSC

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
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Notes for work order 2030126

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Total Alkalinity	251	4	mg/L	250		100	80-120			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Chloride	9.9		mg/L	10.0		99.2	90-110			
Fluoride	10.4		mg/L	10.0		104	90-110			
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030126

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-5 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Snead *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030126 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030126-01 A	4-27-22	8:10	Plastic 1L	1	MW5	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030126-01 B	4-27-22	8:10	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030126-01 C	4-27-22	8:10	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH : ✓				
2030126-01 D	4-27-22	8:10	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1 ✓	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH :				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.9 °C

Preservation Check Performed by: AM

Field data collected by: Travis Snead Date (mm/dd/yy): 4-27-22 Time (24 hr) 8:10

pH 6.20 Cond (umho) 4.14 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 15.78 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Snead	Amy Kerr	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:13:58PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-5 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030126 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030126-01 E	4-27-22	8:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030126-01 F	4-27-22	8:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030126-01 G	4-27-22	8:10	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030126-01 H	4-27-22	8:10	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
__ 181460057
Temp 1.9 °C

Preservation Check Performed by: Ael

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 8:10

pH 6.20 Cond (~~umho~~) 4.14 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 15.78 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	[illegible]	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:13:58PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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CERTIFICATIONS

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484722001	**2030126-01**	Water	04/27/22 08:10	04/29/22 10:15

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SAMPLE ANALYTE COUNT

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484722001	**2030126-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

Sample: 2030126-01 **Lab ID: 30484722001** Collected: 04/27/22 08:10 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0475 ± 0.279 (0.570) C:NA T:96%**	pCi/L	05/24/22 15:31	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.852 ± 0.547 (1.04) C:78% T:90%**	pCi/L	05/19/22 15:54	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.900 ± 0.826 (1.61)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484722001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484722001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484722001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484722001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

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REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030126/MW-5 Wilson 092-00004
Pace Project No.: 30484722

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484722

30484722

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030126 Workorder Name: MW-5 Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:	Requested Analysis

Pace Analytical Services, LLC
825 Industrial Road
Madisonville, KY 42409
270-821-7375
rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					EPA 903.1	EPA 904.0 Radium Sum Calc										LAB USE ONLY
1																						
2	2030126-01		04/27/22 08:10	IR44-McCoy	Water						X	X										001
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[illegible]	4/29/22 1015	
2					
3					

Cooler Temperature on Receipt 17.6 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER 30484702

Pace Analytical Services, LLC Kentucky

2030126

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030126-01	**Water**	**Sampled:04/27/2022 08:10**	**Specific Method**	G1
Radium Total (sub)		10/24/2022 08:10	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 08:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 08:10	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	42922 1015
Released By	Date	Received By	Date

Pace Analytical

Pace Greensburg Lab -Sample Container Count

30484782

Client Pace KY

Profile Number 11851

Site 2030126

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	wt											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484722

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z06H5701402657922

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.6 °C Correction Factor: 0.0 °C Final Temp: 17.6 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 102814 / Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: Int		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS / Date: 5-8-22 / Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030130

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:24

Project Name:	Well Duplicate Wilson 092-00004	Workorder:	2030130

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030130-01	Well Duplicate/	Groundwater	04/27/2022 08:35	04/27/2022 16:15	Travis Sneed

LabNumber	Measurement	Value
2030130-01	Field Conductance	4140
	Field pH	6.20
	Field Temp (C)	15.78

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ANALYTICAL RESULTS

Lab Sample ID: **2030130-01**
Description: **Well Duplicate**

Sample Collection Date Time: 04/27/2022 08:35
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Arsenic	**0.0027**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Boron	**0.75**		mg/L	0.10	0.10	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:42	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Calcium	**614**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:49	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Cobalt	**0.008**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Iron	**7.07**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:42	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/06/2022 14:49	NKP
Magnesium	**257**	D1, L2	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:49	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Molybdenum	**0.004**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Nickel	**0.005**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Potassium	**11.1**	D1, L1	mg/L	10.0	4.40	SW846 6010 B	04/30/2022 10:00	05/18/2022 10:32	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Sodium	**94.7**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:49	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP
Zinc	**0.01**	J	mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:35	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**496**	M3	mg/L	4		2320 B-2011	05/04/2022 13:43	05/04/2022 13:43	HMF
Carbonate Alkalinity as CaCO3	ND	U, M3	mg/L	4		2320 B-2011	05/04/2022 13:43	05/04/2022 13:43	HMF
Total Alkalinity	**496**	M3	mg/L	4		2320 B-2011	05/04/2022 13:43	05/04/2022 13:43	HMF
Chemical Oxygen Demand	**35**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:13	KBZ
Specific Conductance (Lab)	**3830**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**2140**	D	mg/L	5	5	2340 C (as HACH 8226)	05/03/2022 07:38	05/03/2022 07:38	CLL
Total Dissolved Solids	**3510**		mg/L	50	50	2540 C-2011	04/29/2022 15:11	04/29/2022 15:11	HAG
Total Organic Carbon	**2.2**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:37	05/08/2022 01:15	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.047**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**1.74**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**1.79**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.79**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**347**	D, M2	mg/L	50.0	36.0	EPA 300.0 REV 2.1	05/10/2022 02:43	05/10/2022 02:43	CSC
Fluoride	ND	M2, U	mg/L	0.20		EPA 300.0 REV 2.1	05/10/2022 02:12	05/10/2022 02:12	CSC
Sulfate	**1030**	D	mg/L	200	100	EPA 300.0 REV 2.1	05/10/2022 12:50	05/10/2022 12:50	CSC

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Notes for work order 2030130

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3699 - Default Prep Wet Chem										
Blank (BBD3699-BLK1)										
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	ND	25	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3699 - Default Prep Wet Chem										
LCS (BBD3699-BS1)										
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	1480	25	mg/L	1500		98.4	80-120			
Duplicate (BBD3699-DUP1)	**Source: 2030130-01**									
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	3500	50	mg/L		3510			0.343	10	
Batch BBD3805 - Default Prep Wet Chem										
Blank (BBD3805-BLK1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBD3805-BS1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	224	1	mg/L	225		99.6	80-120			
Duplicate (BBD3805-DUP1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	174	1	mg/L		172			1.16	10	
Matrix Spike (BBD3805-MS1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	470	1	mg/L	318	172	93.7	80-120			
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0198 - Default Prep Wet Chem										
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0606 - Default Prep Wet Chem										
Blank (BBE0606-BLK1)										
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 0:11										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0606-BS1)										
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 0:33										
Total Organic Carbon	4.9	0.5	mg/L	5.00		98.4	80-120			
Duplicate (BBE0606-DUP1)	**Source: 2041847-05**									
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 5:48										
Total Organic Carbon	2.2	0.5	mg/L		2.4			7.36	25	
Duplicate (BBE0606-DUP2)	**Source: 2044580-01**									
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 11:04										
Total Organic Carbon	3.9	0.5	mg/L		3.8			1.81	25	
Matrix Spike (BBE0606-MS1)	**Source: 2041847-06**									
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 6:09										
Total Organic Carbon	3.7	0.5	mg/L	2.50	1.5	90.5	80-120			
Matrix Spike (BBE0606-MS2)	**Source: 2044581-01**									
Prepared: 5/5/2022 11:37, Analyzed: 5/8/2022 11:25										
Total Organic Carbon	8.4	0.5	mg/L	5.00	3.5	98.6	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Chloride	9.9		mg/L	10.0		99.2	90-110			
Fluoride	10.4		mg/L	10.0		104	90-110			
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030130

Shipped By: Pace Analytical Services LL Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: Well Duplicate Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030130 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030130-01 A	4-27-22	8:35	Plastic 1L	1	Well Duplicate	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030130-01 B	4-27-22	8:35	Plastic 500mL pH<2 w/HNO3	1	Well Duplicate	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030130-01 C	4-27-22	8:35	Plastic 500mL pH<2 w/H2SO4	1	Well Duplicate	g / c	COD TOC
			Preservation Check: pH : ✓				
2030130-01 D	4-27-22	8:35	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Well Duplicate	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.9 °C

Preservation Check Performed by: AH

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 8:35

pH 6.20 Cond (~~umho~~) 25 4.14 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.78 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	[signature]	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:15:32PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: Well Duplicate Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030130 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030130-01 E	4-27-22	8:35	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Well Duplicate	g / c	Radium 228 (sub)
			Preservation Check: pH : /				
2030130-01 F	4-27-22	8:35	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Well Duplicate	g / c	Radium 228 (sub)
			Preservation Check: pH : /				
2030130-01 G	4-27-22	8:35	Plastic 1L pH<2 w/HNO3 (Sub)	1	Well Duplicate	g / c	Radium Total (sub)
			Preservation Check: pH : /				
2030130-01 H	4-27-22	8:35	AG 250mL pH<2 w/H2SO4	1	Well Duplicate	g / c	TOC
			Preservation Check: pH : /				

Preservation Check Performed by: AC

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 8:35

pH 6.20 Cond (~~umho~~) mS 4.14 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 15.78 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	[illegible]	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:15:32PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484731001	**2030130-01**	Water	04/27/22 08:35	04/29/22 10:15

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484731001	**2030130-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

Sample: 2030130-01 **Lab ID: 30484731001** Collected: 04/27/22 08:35 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0472 ± 0.245 (0.508) C:NA T:94%**	pCi/L	05/24/22 15:47	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.74 ± 0.656 (0.992) C:80% T:91%**	pCi/L	05/19/22 18:59	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.79 ± 0.901 (1.50)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484731001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484731001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484731001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484731001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030130/ Well Duplicate Wilson
Pace Project No.: 30484731

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30484731

30484731

Pace Analytical
www.pacelabs.com

Workorder: 2030130 Workorder Name: Well Duplicate Wilson 092 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030130-01		04/27/22 08:35	IR44-McCoy	Water						X	X	001
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			MSD	4-27-22 1015	
2					
3					

Cooler Temperature on Receipt 15.8 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

30484731

Pace Analytical Services, LLC Kentucky

2030130

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030130-01	**Water**	**Sampled:04/27/2022 08:35**	**Specific Method**	
Radium Total (sub)		10/24/2022 08:35	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 08:35	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 08:35	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	429.22 1015
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30484731
MJS 5-8-20

Client Pace KY

Site 2030130

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484731

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS

Tracking #: 1Z06H5701402657912 LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.8 °C Correction Factor: 0.0 °C Final Temp: 18.8 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 102811 / Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on samples
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16 pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS / Date: 5-8-22 / Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030127

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:34

Project Name:	MW-6 Wilson 092-00004	Workorder:	2030127

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030127-01	MW6/	Groundwater	04/27/2022 11:10	04/27/2022 16:15	Travis Sneed

LabNumber	Measurement	Value
2030127-01	Field Conductance	3240
	Field pH	6.44
	Field Temp (C)	15.89

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ANALYTICAL RESULTS

Lab Sample ID: **2030127-01**
Description: **MW6**

Sample Collection Date Time: 04/27/2022 11:10
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Arsenic	**0.0046**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Boron	**0.52**	M2	mg/L	0.10	0.10	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:04	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Calcium	**484**	D1, M2	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:11	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Cobalt	**0.008**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Iron	**5.32**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:04	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Lithium	**0.04**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/06/2022 14:42	NKP
Magnesium	**210**	L2, M3	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:11	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Molybdenum	**0.006**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Nickel	**0.014**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Potassium	ND	U	mg/L	50.0	22.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:11	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Sodium	**36.7**	M2	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:11	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP
Zinc	**0.02**		mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:28	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**518**		mg/L	4		2320 B-2011	05/04/2022 13:24	05/04/2022 13:24	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 13:24	05/04/2022 13:24	HMF
Total Alkalinity	**518**		mg/L	4		2320 B-2011	05/04/2022 13:24	05/04/2022 13:24	HMF
Chemical Oxygen Demand	**26**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:12	KBZ
Specific Conductance (Lab)	**3030**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**1940**	D	mg/L	5	5	2340 C (as HACH 8226)	05/03/2022 07:38	05/03/2022 07:38	CLL
Total Dissolved Solids	**2790**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.9**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 21:02	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.230**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**1.26**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium	**1.49**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**1.49**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**16.5**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 23:54	05/09/2022 23:54	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 23:54	05/09/2022 23:54	CSC
Sulfate	**1470**	D	mg/L	200	100	EPA 300.0 REV 2.1	05/10/2022 00:09	05/10/2022 00:09	CSC

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Notes for work order 2030127

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBD3805 - Default Prep Wet Chem										
Blank (BBD3805-BLK1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBD3805-BS1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	224	1	mg/L	225		99.6	80-120			
Duplicate (BBD3805-DUP1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	174	1	mg/L		172			1.16	10	
Matrix Spike (BBD3805-MS1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	470	1	mg/L	318	172	93.7	80-120			
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0198 - Default Prep Wet Chem										
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Fluoride	10.4		mg/L	10.0		104	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030127

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-6 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: Ky

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY
Workorder # 2030127

Sample ID#	*required information* Date (mm/dd/yy): 4-27-22	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030127-01 A	4-27-22	11:10	Plastic 1L	1	MW6	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030127-01 B	4-27-22	11:10	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030127-01 C	4-27-22	11:10	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
			Preservation Check: pH : ✓				
2030127-01 D	4-27-22	11:10	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

nometer Serial Number
✓ 181390287
181460057
Temp 1.9 °C

Preservation Check Performed by: All

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 11:10

pH 6.44 Cond (~~umho~~) 25 324 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 19.89 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	Johnny Lam	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:14:29PM

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-6 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2030127 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030127-01 E	4-27-22	11:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030127-01 F	4-27-22	11:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030127-01 G	4-27-22	11:10	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW6	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030127-01 H	4-27-22	11:10	AG 250mL pH<2 w/H2SO4	1	MW6	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: AU

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 11:10

pH 6.44 Cond ~~(umho)~~ mS 3.24 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 15.89 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	[illegible]	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:14:29PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484724001	**2030127-01**	Water	04/27/22 11:10	04/29/22 10:15

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484724001	**2030127-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

Sample: 2030127-01 **Lab ID: 30484724001** Collected: 04/27/22 11:10 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.230 ± 0.350 (0.603) C:NA T:93%**	pCi/L	05/24/22 15:31	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.26 ± 0.622 (1.09) C:81% T:83%**	pCi/L	05/19/22 18:59	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.49 ± 0.972 (1.69)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484724001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484724001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484724001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484724001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030127/MW-6 Wilson 092-00004
Pace Project No.: 30484724

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484724

30484724

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030127 Workorder Name: MW-6 Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~/2022 2.0

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030127-01		04/27/22 11:10	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	4-27-22 10[illegible]	
2					
3					

Cooler Temperature on Receipt 13.2 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky 30484734

2030127

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030127-01	**Water**	**Sampled:04/27/2022 11:10**	**Specific Method**	
Radium Total (sub)		10/24/2022 11:10	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 11:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 11:10	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	4/29-22 1015
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30484724

Client Pace KY

Site 203127

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	Wt											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484724

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login WP

Tracking #: 1Z06H5701402657 92

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.2 °C Correction Factor: +0.0 °C Final Temp: 18.2 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 100281	Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.	
Chain of Custody Filled Out:	✓			2.	
Chain of Custody Relinquished:	✓			3.	
Sampler Name & Signature on COC:		✓		4.	
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers	
Samples Arrived within Hold Time:	✓			6.	
Short Hold Time Analysis (<72hr remaining):		✓		7.	
Rush Turn Around Time Requested:		✓		8.	
Sufficient Volume:	✓			9.	
Correct Containers Used:	✓			10.	
-Pace Containers Used:		✓			
Containers Intact:	✓			11.	
Orthophosphate field filtered			✓	12.	
Hex Cr Aqueous sample field filtered			✓	13.	
Organic Samples checked for dechlorination:			✓	14.	
Filtered volume received for Dissolved tests			✓	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2	
All containers meet method preservation requirements.	✓			Initial when completed MJS	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			✓	17.	
Trip Blank Present:			✓	18.	
Trip Blank Custody Seals Present			✓		
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS	Date: 5-8-22 Survey Meter SN: 1523

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030128

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:43

Project Name:	MW-7 Wilson 092-00004	Workorder:	2030128

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030128-01	MW7/	Groundwater	04/27/2022 14:45	04/27/2022 16:15	Travis Sneed

LabNumber	Measurement	Value
2030128-01	Field Conductance	2750
	Field pH	6.47
	Field Temp (C)	16.84

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

ANALYTICAL RESULTS

Lab Sample ID: **2030128-01**
Description: **MW7**

Sample Collection Date Time: 04/27/2022 14:45
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Arsenic	**0.0040**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Barium	**0.013**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Boron	**3.05**	D1	mg/L	1.00	1.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:17	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Calcium	**420**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:30	MRWD
Chromium	**0.0006**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Iron	**5.49**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:14	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Lithium	**0.19**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/06/2022 14:35	NKP
Magnesium	**141**	D1, L2	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:30	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Molybdenum	**0.006**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Nickel	**0.005**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Potassium	**8.02**	D1, L1	mg/L	5.00	2.20	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:17	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Sodium	**47.2**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:30	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP
Zinc	**0.01**	J	mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:30	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**349**		mg/L	4		2320 B-2011	05/04/2022 13:32	05/04/2022 13:32	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 13:32	05/04/2022 13:32	HMF
Total Alkalinity	**349**		mg/L	4		2320 B-2011	05/04/2022 13:32	05/04/2022 13:32	HMF
Chemical Oxygen Demand	**36**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:12	KBZ
Specific Conductance (Lab)	**2620**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**1280**	D	mg/L	5	5	2340 C (as HACH 8226)	05/03/2022 07:38	05/03/2022 07:38	CLL
Total Dissolved Solids	**2310**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.6**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 22:26	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**-0.090**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**0.605**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**0.605**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.605**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**120**	D	mg/L	2.5	1.8	EPA 300.0 REV 2.1	05/10/2022 01:11	05/10/2022 01:11	CSC
Fluoride	**0.22**		mg/L	0.20		EPA 300.0 REV 2.1	05/10/2022 00:55	05/10/2022 00:55	CSC
Sulfate	**1950**	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/10/2022 01:26	05/10/2022 01:26	CSC

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Notes for work order 2030128

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1)	**Source: 2030111-01**									
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2)	**Source: 2030111-01**									
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBD3805 - Default Prep Wet Chem										
Blank (BBD3805-BLK1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBD3805-BS1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	224	1	mg/L	225		99.6	80-120			
Duplicate (BBD3805-DUP1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	174	1	mg/L		172			1.16	10	
Matrix Spike (BBD3805-MS1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	470	1	mg/L	318	172	93.7	80-120			
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0198 - Default Prep Wet Chem										
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Fluoride	10.4		mg/L	10.0		104	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030128

Shipped By: Pace Analytical Services LL Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-7 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sheed
"required information"

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030128 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030128-01 A	4-27-22	14:45	Plastic 1L	1	MW7	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030128-01 B	4-27-22	14:45	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030128-01 C	4-27-22	14:45	Plastic 500mL pH<2 w/H2SO4	1	MW7	g / c	COD TOC
			Preservation Check: pH : ✓				
2030128-01 D	4-27-22	14:45	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1 ✓	MW7	g / c	Radium 226 (sub)
			Preservation Check: pH : ____				

...meter Serial Number
✓ 171390287
1e1460057
Temp 1.9 °C

Preservation Check Performed by: AM

Field data collected by: Travis Sheed Date (mm/dd/yy) 4-27-22 Time (24 hr) 14:45

pH 6.47 Cond (~~umho~~) mS 2.75 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.84 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sheed	Amy Zan	4-27-22	1615

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:14:49PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-7 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Tom Smith *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030128 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030128-01 E	4-27-22	14:45	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030128-01 F	4-27-22	14:45	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030128-01 G	4-27-22	14:45	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030128-01 H	4-27-22	14:45	AG 250mL pH<2 w/H2SO4	1	MW7	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: AU

Field data collected by: Tom Smith Date (mm/dd/yy) 4-27-22 Time (24 hr) 14:45

pH 6.47 Cond ~~(umho)~~ mS 2.75 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.84 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Tom Smith	[illegible]	4-27-22	1615

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:14:49PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484729001	**2030128-01**	Water	04/27/22 14:45	04/29/22 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484729001	**2030128-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

Sample: 2030128-01 **Lab ID: 30484729001** Collected: 04/27/22 14:45 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.0903 ± 0.206 (0.486) C:NA T:91%**	pCi/L	05/24/22 15:47	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.605 ± 0.518 (1.04) C:78% T:89%**	pCi/L	05/19/22 18:59	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.605 ± 0.724 (1.53)**	pCi/L	06/01/22 12:01	7440-14-4	

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484729001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484729001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484729001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484729001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030128/MW-7 Wilson 092-00004
Pace Project No.: 30484729

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484729

30484729

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030128 Workorder Name: MW-7 Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030128-01		04/27/22 14:45	IR44-McCoy	Water						X	X	001
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	42922 1015	
2					
3					

Cooler Temperature on Receipt 18.1 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30484729

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030128

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
				01
Sample ID: 2030128-01	**Water**	**Sampled:04/27/2022 14:45**	**Specific Method**	
Radium Total (sub)		10/24/2022 14:45	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 14:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 14:45	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	4-29-22 1015
Released By	Date	Received By	Date

30484729

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

Client Pace KY

Profile Number 11851

Site

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484729

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS

Tracking #: 1Z0694570140265792 LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None pulled

Cooler Temperature Observed Temp 18.1 °C Correction Factor: 0.0 °C Final Temp: 18.1 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 1002811 / Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. MJS 5-8-22 No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS / Date: 5-8-22 / Survey Meter SN: 1063

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030129

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:00

Project Name:	MW-8 Wilson 092-00004	Workorder:	2030129

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030129-01	MW8/	Groundwater	04/27/2022 06:20	04/27/2022 16:15	Travis Sneed

LabNumber	Measurement	Value
2030129-01	Field Conductance	1870
	Field pH	6.28
	Field Temp (C)	16.50

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ANALYTICAL RESULTS

Lab Sample ID: **2030129-01**
Description: **MW8**

Sample Collection Date Time: 04/27/2022 06:20
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Arsenic	**0.0102**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Barium	**0.050**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:33	MRWD
Cadmium	**0.0003**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Calcium	**239**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:39	MRWD
Chromium	**0.0155**		mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Cobalt	**0.009**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Copper	**0.010**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Iron	**35.8**	D1	mg/L	1.00	0.500	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:36	MRWD
Lead	**0.007**		mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Lithium	**0.02**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/06/2022 14:47	NKP
Magnesium	**91.5**	D1, L2	mg/L	2.00	0.900	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:36	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Molybdenum	**0.01**		mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Nickel	**0.023**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Potassium	**6.28**	D1, L1	mg/L	5.00	2.20	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:36	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Sodium	**35.9**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 15:39	MRWD
Thallium	**0.0001**	J	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP
Zinc	**0.07**		mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:33	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**277**		mg/L	4		2320 B-2011	05/04/2022 13:38	05/04/2022 13:38	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 13:38	05/04/2022 13:38	HMF
Total Alkalinity	**277**		mg/L	4		2320 B-2011	05/04/2022 13:38	05/04/2022 13:38	HMF
Chemical Oxygen Demand	**68**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:12	KBZ
Specific Conductance (Lab)	**1780**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**760**	D	mg/L	2	2	2340 C (as HACH 8226)	05/03/2022 07:38	05/03/2022 07:38	CLL
Total Dissolved Solids	**1470**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**3.2**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 22:47	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.393**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**1.13**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**1.52**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.52**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**3.7**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/10/2022 01:42	05/10/2022 01:42	CSC
Fluoride	**0.25**		mg/L	0.20		EPA 300.0 REV 2.1	05/10/2022 01:42	05/10/2022 01:42	CSC
Sulfate	**1330**	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/10/2022 01:57	05/10/2022 01:57	CSC

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Notes for work order 2030129

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Madisonville, KY 42431
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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1)	**Source: 2030111-01**									
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2)	**Source: 2030111-01**									
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBD3805 - Default Prep Wet Chem										
Blank (BBD3805-BLK1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBD3805-BS1)										
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	224	1	mg/L	225		99.6	80-120			
Duplicate (BBD3805-DUP1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	174	1	mg/L		172			1.16	10	
Matrix Spike (BBD3805-MS1)	**Source: 2044069-02**									
Prepared: 5/3/2022 7:38, Analyzed: 5/3/2022 7:38										
Hardness as CaCO3	470	1	mg/L	318	172	93.7	80-120			
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U

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P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0198 - Default Prep Wet Chem										
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Fluoride	10.4		mg/L	10.0		104	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2

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Madisonville, KY 42431
270.821.7375
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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030129

Shipped By: Client

Temperature: 1.80° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-8 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Tim Sneed
required information

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030129 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030129-01 A	4-27-22	6:20	Plastic 1L	1	MW8	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030129-01 B	4-27-22	6:20	Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030129-01 C	4-27-22	6:20	Plastic 500mL pH<2 w/H2SO4	1	MW8	g / c	COD TOC
			Preservation Check: pH : ✓				
2030129-01 D	4-27-22	6:20	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.8 °C

Preservation Check Performed by: AM

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 6:20

pH 6.28 Cond (~~umho~~) 1.87 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.5C or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Tim Sneed	Ashley Ham	4-27-22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:15:11PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-8 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: Ky

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030129 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030129-01 E	4-27-22	6:20	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030129-01 F	4-27-22	6:20	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030129-01 G	4-27-22	6:20	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW8	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030129-01 H	4-27-22	6:20	AG 250mL pH<2 w/H2SO4	1	MW8	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: AA

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-27-22 Time (24 hr) 6:20

pH 6.28 Cond (~~umho~~) MS 1.87 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.5C or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	ahmyza	4-27-22	1615

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:15:11PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484714001	**2030129-01**	Water	04/27/22 06:20	04/29/22 10:15

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SAMPLE ANALYTE COUNT

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484714001	**2030129-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

Sample: 2030129-01 **Lab ID: 30484714001** Collected: 04/27/22 06:20 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.393 ± 0.333 (0.413) C:NA T:91%**	pCi/L	05/24/22 15:31	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.13 ± 0.559 (0.978) C:79% T:95%**	pCi/L	05/19/22 15:54	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.52 ± 0.892 (1.39)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484714001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484714001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484714001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484714001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030129/MW-8 Wilson 092-00004
Pace Project No.: 30484714

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484714

30484714

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030129 Workorder Name: MW-8 Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc										LAB USE ONLY
1																						
2	2030129-01		04/27/22 06:20	IR44-McCoy	Water						X	X										001
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1				4/28/22 10:5	
2					
3					

Cooler Temperature on Receipt 17.9 °C **Custody Seal Y or (N)** **Received on Ice (Y) or N** **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER 30484704

Pace Analytical Services, LLC Kentucky

2030129

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 2030129-01 **Water**	**Sampled:04/27/2022 06:20**	**Specific Method**	
Radium Total (sub)	10/24/2022 06:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/24/2022 06:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/24/2022 06:20	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	4292210:15
Released By	Date	Received By	Date

30484714

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

Client Pace KY

Profile Number 11851

Site 2030129

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	Wt											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484714

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS

Tracking #: 1Z06H5701402657912 LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.9 °C Correction Factor: 0.0 °C Final Temp: 17.9 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 1002811 / Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS / Date: 5-8-22 / Survey Meter SN: 563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030112

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:50

Project Name:	MW-10 Wilson 092-00004	Workorder:	2030112

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
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Madisonville, KY 42431
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030112-01	MW10/	Groundwater	04/27/2022 08:00	04/27/2022 16:15	Phillip Hill

LabNumber	Measurement	Value
2030112-01	Field Conductance	3780
	Field pH	6.25
	Field Temp (C)	13.78

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ANALYTICAL RESULTS

Lab Sample ID: **2030112-01**
Description: **MW10**

Sample Collection Date Time: 04/27/2022 08:00
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Arsenic	**0.0009**	J	mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Barium	**0.004**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Boron	**0.43**		mg/L	0.10	0.10	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:34	MRWD
Cadmium	**0.0001**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Calcium	**391**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:41	MRWD
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Cobalt	**0.022**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Iron	**9.03**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:34	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Lithium	**0.006**	J	mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Magnesium	**207**	D1, L2	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 16:58	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Nickel	**0.034**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Potassium	**4.81**	D1, L1	mg/L	2.50	1.10	SW846 6010 B	04/30/2022 10:00	05/17/2022 16:35	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Sodium	**145**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:41	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP
Zinc	**0.02**		mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:04	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**359**		mg/L	4		2320 B-2011	05/04/2022 11:28	05/04/2022 11:28	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:28	05/04/2022 11:28	HMF
Total Alkalinity	**359**		mg/L	4		2320 B-2011	05/04/2022 11:28	05/04/2022 11:28	HMF
Chemical Oxygen Demand	**40**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:47	KBZ
Specific Conductance (Lab)	**3320**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**1650**	D	mg/L	5	5	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
Total Dissolved Solids	**3160**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.5**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 14:00	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.108**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**0.816**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**0.924**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.924**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**57.9**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/08/2022 22:33	05/08/2022 22:33	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/08/2022 22:33	05/08/2022 22:33	CSC
Sulfate	**1420**	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/08/2022 23:13	05/08/2022 23:13	CSC

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Notes for work order 2030112

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Total Alkalinity	251	4	mg/L	250		100	80-120			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0200 - Default Prep Wet Chem										
Blank (BBE0200-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:33										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0200-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:43										
Chemical Oxygen Demand	116	8	mg/L	125		92.6	90-110			
Duplicate (BBE0200-DUP1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	23	8	mg/L		26			12.1	25	
Matrix Spike (BBE0200-MS1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	293	8	mg/L	250	26	107	90-110			
Matrix Spike Dup (BBE0200-MSD1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	297	8	mg/L	250	26	108	90-110	1.22	10	
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Chloride	9.3		mg/L	10.0		92.6	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030112

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-10 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030112 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030112-01 A	4/27/22	800	Plastic 1L	1	MW10	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030112-01 B	4/27/22	800	Plastic 500mL pH<2 w/HNO3	1	MW10	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030112-01 C	4/27/22	800	Plastic 500mL pH<2 w/H2SO4	1	MW10	g / c	COD TOC
			Preservation Check: pH : ✓				
2030112-01 D	4/27/22	800	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.9 °C

Preservation Check Performed by: ALL

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 800

pH 6.25 Cond ~~(umho)~~ mS/cm 13.78 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 13.78 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:08:10PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-10 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030112

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030112-01 E	4/27/22	800	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030112-01 F	4/27/22	800	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030112-01 G	4/27/22	800	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW10	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030112-01 H	4/27/22	800	AG 250mL pH<2 w/H2SO4	1	MW10	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: AEL

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 800

pH ____ Cond (umho) ____ Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) ____ or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:08:10PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484718001	**2030112-01**	Water	04/27/22 08:00	04/29/22 10:15

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484718001	**2030112-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

Sample: 2030112-01 **Lab ID: 30484718001** Collected: 04/27/22 08:00 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.108 ± 0.299 (0.580) C:NA T:82%**	pCi/L	05/24/22 15:31	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.816 ± 0.581 (1.13) C:72% T:91%**	pCi/L	05/19/22 15:54	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.924 ± 0.880 (1.71)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484718001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484718001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484718001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484718001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030112/MW-10 Wilson 092-00004
Pace Project No.: 30484718

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30484718

30484718

Pace Analytical
www.pacelabs.com

Workorder: 2030112 Workorder Name: MW-10 Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:	Requested Analysis

Pace Analytical Services, LLC
825 Industrial Road
Madisonville, KY 42409
270-821-7375
rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030112-01		04/27/22 08:00	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	4/27/22 1015	
2					
3					

Cooler Temperature on Receipt 18.4 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER 30484718

Pace Analytical Services, LLC Kentucky

2030112

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030112-01	**Water**	**Sampled:04/27/2022 08:00**	**Specific Method**	
Radium Total (sub)		10/24/2022 08:00	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 08:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 08:00	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	4-29-22 1015
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30484718

Client Pace KY

Profile Number 11851

Site 2030117

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	Wt											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30484718

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS

Tracking #: 1Z06H5701402657 92

LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.6 °C Correction Factor: 0.0 °C Final Temp: 18.6 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 100281	Date and Initials of person examining contents: MJS 5-8-22
Chain of Custody Present:	✓			1.	
Chain of Custody Filled Out:	✓			2.	
Chain of Custody Relinquished:	✓			3.	
Sampler Name & Signature on COC:		✓		4.	
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers	
Samples Arrived within Hold Time:	✓			6.	
Short Hold Time Analysis (<72hr remaining):		✓		7.	
Rush Turn Around Time Requested:		✓		8.	
Sufficient Volume:	✓			9.	
Correct Containers Used: -Pace Containers Used:	✓	✓		10.	
Containers Intact:	✓			11.	
Orthophosphate field filtered			✓	12.	
Hex Cr Aqueous sample field filtered			✓	13.	
Organic Samples checked for dechlorination:			✓	14.	
Filtered volume received for Dissolved tests			✓	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2	
All containers meet method preservation requirements.	✓			Initial when completed MJS	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			✓	17.	
Trip Blank Present:			✓	18.	
Trip Blank Custody Seals Present			✓		
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS	Date: 5-8-22 Survey Meter SN: 1503

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030125

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:31

Project Name:	MW-4D Wilson 092-00004	Workorder:	2030125

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030125-01	MW4D/	Groundwater	04/27/2022 11:00	04/27/2022 16:15	Phillip Hill

LabNumber	Measurement	Value
2030125-01	Field Conductance	5990
	Field pH	7.34
	Field Temp (C)	16.63

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ANALYTICAL RESULTS

Lab Sample ID: **2030125-01**
Description: **MW4D**

Sample Collection Date Time: 04/27/2022 11:00
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Arsenic	**0.0030**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Barium	**0.015**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Boron	**10.3**	D1	mg/L	10.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:52	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Calcium	**678**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:52	MRWD
Chromium	**0.0013**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Cobalt	**0.009**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Iron	**6.01**		mg/L	0.100	0.050	SW846 6010 B	04/30/2022 10:00	05/06/2022 12:31	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Lithium	**0.18**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/14/2022 13:51	NKP
Magnesium	**240**	D1, L2	mg/L	20.0	9.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:52	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Molybdenum	**0.007**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Nickel	**0.023**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Potassium	**46.4**	L1, D2	mg/L	25.0	11.0	SW846 6010 B	05/18/2022 09:00	05/19/2022 09:55	MRWD
Selenium	**0.001**	J	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Sodium	**233**	D1	mg/L	26.0	10.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 14:52	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP
Zinc	**0.02**		mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:24	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**405**		mg/L	4		2320 B-2011	05/04/2022 13:10	05/04/2022 13:10	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 13:10	05/04/2022 13:10	HMF
Total Alkalinity	**405**		mg/L	4		2320 B-2011	05/04/2022 13:10	05/04/2022 13:10	HMF
Chemical Oxygen Demand	**59**	M2	mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:12	KBZ
Specific Conductance (Lab)	**5170**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**2550**	D	mg/L	5	5	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
Total Dissolved Solids	**4210**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.0**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 20:20	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.143**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**0.931**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**1.07**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.07**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1110**	D	mg/L	50.0	36.0	EPA 300.0 REV 2.1	05/09/2022 22:52	05/09/2022 22:52	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 22:37	05/09/2022 22:37	CSC
Sulfate	**2260**		mg/L	100	50.0	EPA 300.0 REV 2.1	05/09/2022 22:52	05/09/2022 22:52	CSC

D

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Notes for work order 2030125

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1
Batch BBE2180 - EPA 200.2										
Blank (BBE2180-BLK1)										
Prepared: 5/18/2022 9:00, Analyzed: 5/18/2022 14:57										
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE2180 - EPA 200.2										
Blank (BBE2180-BLK2)										
Prepared: 5/18/2022 9:00, Analyzed: 5/19/2022 9:46										
Potassium	ND	0.50	mg/L							U
LCS (BBE2180-BS1)										
Prepared: 5/18/2022 9:00, Analyzed: 5/18/2022 15:00										
Potassium	7.77	0.50	mg/L	6.25		124	85-115			L1
LCS (BBE2180-BS2)										
Prepared: 5/18/2022 9:00, Analyzed: 5/19/2022 9:49										
Potassium	8.16	0.50	mg/L	6.25		130	85-115			L1
Matrix Spike (BBE2180-MS1) **Source: 2053860-01**										
Prepared: 5/18/2022 9:00, Analyzed: 5/18/2022 15:22										
Potassium	990	1.00	mg/L	12.5	936	439	80-120			M3, E
Matrix Spike Dup (BBE2180-MSD1) **Source: 2053860-01**										
Prepared: 5/18/2022 9:00, Analyzed: 5/18/2022 15:44										
Potassium	1000	1.00	mg/L	12.5	936	548	80-120	1.37	20	M3, E
Post Spike (BBE2180-PS1) **Source: 2053860-01**										
Prepared: 5/18/2022 9:00, Analyzed: 5/18/2022 15:47										
Potassium	499000		ug/L	6250	468000	501	75-125			M3

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Total Alkalinity	251	4	mg/L	250		100	80-120			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0198 - Default Prep Wet Chem										
Blank (BBE0198-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0198-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:08										
Chemical Oxygen Demand	131	8	mg/L	125		105	90-110			
Duplicate (BBE0198-DUP1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	72	8	mg/L		59			19.8	25	
Matrix Spike (BBE0198-MS1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	282	8	mg/L	250	59	89.2	90-110			M2
Matrix Spike Dup (BBE0198-MSD1)	**Source: 2030125-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:17										
Chemical Oxygen Demand	276	8	mg/L	250	59	86.7	90-110	2.21	10	M2
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Fluoride	10.4		mg/L	10.0		104	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030125

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-4D Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mott
required information

Compliance Monitoring? Yes X No
Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030125 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030125-01 A	4/27/22	1100	Plastic 1L	1	MW4D	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
2030125-01 B	4/27/22	1100	Plastic 500mL pH<2 w/HNO3	1	MW4D	g / c	
			Preservation Check: pH : /				
2030125-01 C	4/27/22	1100	Plastic 500mL pH<2 w/H2SO4	1	MW4D	g / c	COD TOC
			Preservation Check: pH : /				
2030125-01 D	4/27/22	1100	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4D	g / c	Radium 226 (sub)
			Preservation Check: pH : /				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.9 °C

Preservation Check Performed by: All

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 1100

pH 7.34 Cond ~~umhos~~ mS/cm 5.99 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 16.63 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mott	[signature]	4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:13:37PM

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P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-4D Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature):

required information

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030125 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030125-01 E	4/27/22	1100	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4D	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030125-01 F	4/27/22	1100	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4D	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030125-01 G	4/27/22	1100	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW4D	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030125-01 H	4/27/22	1100	AG 250mL pH<2 w/H2SO4	1 ✓	MW4D	g / c	TOC
			Preservation Check: pH : ____				

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 1100

pH ____ Cond (umho) ____ Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) ____ or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:13:37PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484727001	**2030125-01**	Water	04/27/22 11:00	04/29/22 10:15

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484727001	**2030125-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

Sample: 2030125-01 **Lab ID: 30484727001** Collected: 04/27/22 11:00 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.143 ± 0.219 (0.352) C:NA T:92%**	pCi/L	05/24/22 15:47	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.931 ± 0.531 (0.975) C:79% T:96%**	pCi/L	05/19/22 19:03	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.07 ± 0.750 (1.33)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484727001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484727001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484727001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484727001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030125/MW-4D Wilson 092-00004
Pace Project No.: 30484727

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484727

30484727

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030125 Workorder Name: MW-4D Wilson 092-00004 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030125-01		04/27/22 11:00	IR44-McCoy	Water						X	X	
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			MS	4-29-22 1015	
2					
3					

Cooler Temperature on Receipt 18.7 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030125

30484727

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030125-01	**Water**	**Sampled:04/27/2022 11:00**	**Specific Method**	
Radium Total (sub)		10/24/2022 11:00	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 11:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 11:00	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature]	4-29-22 1015
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30484727

Client Pace KY

Site 203125

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	Wt											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

PaceAnalytical

Client Name: Pace KY Project # 30484707

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login NP

Tracking #: 1Z06H5701402657912

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 18.7 °C Correction Factor: 0.0 °C Final Temp: 18.7 °C

Temp should be above freezing to 6°C

pH paper Lot# 100281 Date and Initials of person examining contents: MJS 5-8-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS Date: 5-8-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030116

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 08:52

Project Name:	MW-10D Wilson 092-00004	Workorder:	2030116

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/27/2022 16:15.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030116-01	MW-10D/	Groundwater	04/27/2022 09:20	04/27/2022 16:15	Phillip Hill

LabNumber	Measurement	Value
2030116-01	Field Conductance	3480
	Field pH	7.11
	Field Temp (C)	14.02

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

ANALYTICAL RESULTS

Lab Sample ID: **2030116-01**
Description: **MW-10D**

Sample Collection Date Time: 04/27/2022 09:20
Sample Received Date Time: 04/27/2022 16:15

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Arsenic	**0.0029**		mg/L	0.0010	0.0004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Barium	**0.016**		mg/L	0.004	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Boron	**3.16**	D2	mg/L	1.00	1.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:47	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Calcium	**482**	D1	mg/L	40.0	13.0	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:50	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Cobalt	**0.005**		mg/L	0.004	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Iron	**12.0**	D1	mg/L	1.00	0.500	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:47	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Lithium	**0.07**		mg/L	0.02	0.005	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Magnesium	**94.9**	D1, L2	mg/L	2.00	0.900	SW846 6010 B	04/30/2022 10:00	05/06/2022 17:01	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Molybdenum	**0.009**	J	mg/L	0.01	0.002	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Nickel	**0.011**		mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Potassium	**14.5**	D1, L1	mg/L	10.0	4.40	SW846 6010 B	04/30/2022 10:00	05/18/2022 10:18	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Sodium	**90.8**	D1	mg/L	2.60	1.00	SW846 6010 B	04/30/2022 10:00	05/06/2022 11:47	MRWD
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP
Zinc	**0.006**	J	mg/L	0.02	0.004	SW846-6020 A	04/30/2022 10:00	05/03/2022 12:06	NKP

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**231**		mg/L	4		2320 B-2011	05/04/2022 11:54	05/04/2022 11:54	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:54	05/04/2022 11:54	HMF
Total Alkalinity	**231**		mg/L	4		2320 B-2011	05/04/2022 11:54	05/04/2022 11:54	HMF
Chemical Oxygen Demand	**34**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:47	KBZ
Specific Conductance (Lab)	**3070**		umhos/cm	1	1	2510 B-2011	04/28/2022 14:33	04/28/2022 14:33	CML
Hardness as CaCO3	**1690**	D	mg/L	5	5	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
Total Dissolved Solids	**1070**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.3**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 15:25	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.277**	_Sub	pCi/L			EPA 903.1	06/07/2022 16:02	06/07/2022 16:04	JDG
See Attached Subcontract Report	**1.35**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG
Radium	**1.63**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.63**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/07/2022 16:02	06/07/2022 16:04	JDG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**145**	D	mg/L	2.5	1.8	EPA 300.0 REV 2.1	05/09/2022 02:38	05/09/2022 02:38	CSC
Fluoride	**0.41**		mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 02:17	05/09/2022 02:17	CSC
Sulfate	**1150**	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/09/2022 02:58	05/09/2022 02:58	CSC

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Notes for work order 2030116

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
L2	The associated blank spike recovery was below method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Blank (BBD3692-BLK1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:53										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.002	0.003	mg/L							J
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.004	0.02	mg/L							J
Blank (BBD3692-BLK2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:03										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3692-BLK3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:33										
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
LCS (BBD3692-BS1)										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 11:55										
Antimony	0.070	0.005	mg/L	0.0625		112	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		96.6	85-115			
Arsenic	0.0638	0.0010	mg/L	0.0625		102	85-115			
Barium	0.063	0.004	mg/L	0.0625		102	85-115			
Beryllium	0.0623	0.0020	mg/L	0.0625		99.7	85-115			
Cadmium	0.0642	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0637	0.0020	mg/L	0.0625		102	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		101	85-115			
Copper	0.064	0.003	mg/L	0.0625		103	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.063	0.003	mg/L	0.0625		101	85-115			
Selenium	0.064	0.003	mg/L	0.0625		103	85-115			
Thallium	0.0633	0.0020	mg/L	0.0625		101	85-115			
Zinc	0.07	0.02	mg/L	0.0625		108	85-115			
LCS (BBD3692-BS2)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 11:06										
Boron	0.13	0.10	mg/L	0.125		101	85-115			
Calcium	6.17	0.40	mg/L	6.25		98.7	85-115			
Iron	6.07	0.100	mg/L	6.25		97.0	85-115			
Magnesium	5.27	0.200	mg/L	6.25		84.3	85-115			L2
Potassium	8.27	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.19	0.26	mg/L	6.25		99.0	85-115			
LCS (BBD3692-BS3)										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:46										
Magnesium	5.17	0.200	mg/L	6.25		82.6	85-115			L2
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:37										
Mercury	0.0023	0.0005	mg/L	0.00250	0.0003	80.4	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	92.9	80-120			
Antimony	0.069	0.005	mg/L	0.0625	ND	110	80-120			
Arsenic	0.0705	0.0010	mg/L	0.0625	0.0019	110	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.007	99.3	80-120			
Beryllium	0.0509	0.0020	mg/L	0.0625	ND	81.4	80-120			
Cadmium	0.0636	0.0010	mg/L	0.0625	0.0039	95.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	ND	109	80-120			
Cobalt	0.349	0.004	mg/L	0.0625	0.299	80.8	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	94.5	80-120			
Lithium	0.18	0.02	mg/L	0.0625	0.15	59.6	80-120			M2
Nickel	0.702	0.003	mg/L	0.0625	0.662	62.6	80-120			M2
Selenium	0.066	0.003	mg/L	0.0625	ND	106	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.1	80-120			
Zinc	1.01	0.02	mg/L	0.0625	0.93	138	80-120			M3, E
Matrix Spike (BBD3692-MS2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:41										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	98.0	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	102	80-120			
Arsenic	0.0721	0.0010	mg/L	0.0625	0.0046	108	80-120			
Barium	0.074	0.004	mg/L	0.0625	0.011	100	80-120			
Beryllium	0.0527	0.0020	mg/L	0.0625	ND	84.3	80-120			
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	96.1	80-120			
Chromium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.067	0.004	mg/L	0.0625	0.008	95.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.8	80-120			
Lead	0.059	0.002	mg/L	0.0625	ND	93.9	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	75.2	80-120			
Nickel	0.072	0.003	mg/L	0.0625	0.014	92.8	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	112	80-120			
Thallium	0.0600	0.0020	mg/L	0.0625	ND	96.0	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.02	90.7	80-120			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike (BBD3692-MS3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:14										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	516	40.0	mg/L	6.25	496	327	80-120			D2, M1
Iron	67.4	10.0	mg/L	6.25	60.7	107	80-120			D2
Magnesium	183	20.0	mg/L	6.25	18.5	NR	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	108	26.0	mg/L	6.25	103	75.2	80-120			D2, M2
Matrix Spike (BBD3692-MS4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:20										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	477	40.0	mg/L	6.25	484	NR	80-120			D2, M2
Iron	11.7	10.0	mg/L	6.25	5.32	102	80-120			D2
Magnesium	211	20.0	mg/L	6.25	210	12.4	80-120			D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	41.5	26.0	mg/L	6.25	36.7	75.7	80-120			D2, M2
Matrix Spike Dup (BBD3692-MSD1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:39										
Molybdenum	0.06	0.01	mg/L	0.0625	0.003	99.3	80-120	6.35	20	
Mercury	0.0025	0.0005	mg/L	0.00250	0.0003	89.4	80-120	9.38	20	
Antimony	0.074	0.005	mg/L	0.0625	ND	118	80-120	7.02	20	
Arsenic	0.0753	0.0010	mg/L	0.0625	0.0019	117	80-120	6.58	20	
Barium	0.074	0.004	mg/L	0.0625	0.007	108	80-120	7.45	20	
Beryllium	0.0549	0.0020	mg/L	0.0625	ND	87.9	80-120	7.63	20	
Cadmium	0.0684	0.0010	mg/L	0.0625	0.0039	103	80-120	7.28	20	
Chromium	0.0688	0.0020	mg/L	0.0625	ND	110	80-120	1.41	20	
Cobalt	0.376	0.004	mg/L	0.0625	0.299	124	80-120	7.52	20	M2
Copper	0.061	0.003	mg/L	0.0625	ND	98.2	80-120	6.60	20	
Lead	0.063	0.002	mg/L	0.0625	ND	100	80-120	5.85	20	
Lithium	0.20	0.02	mg/L	0.0625	0.15	80.8	80-120	7.02	20	
Nickel	0.757	0.003	mg/L	0.0625	0.662	152	80-120	7.66	20	M1
Selenium	0.072	0.003	mg/L	0.0625	ND	114	80-120	8.05	20	
Thallium	0.0636	0.0020	mg/L	0.0625	0.0002	101	80-120	6.28	20	
Zinc	1.09	0.02	mg/L	0.0625	0.93	261	80-120	7.33	20	M3, E

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Matrix Spike Dup (BBD3692-MSD2) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:44										
Antimony	0.071	0.005	mg/L	0.0625	ND	113	80-120	2.25	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	2.90	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	104	80-120	2.03	20	
Arsenic	0.0737	0.0010	mg/L	0.0625	0.0046	111	80-120	2.20	20	
Barium	0.075	0.004	mg/L	0.0625	0.011	102	80-120	1.42	20	
Beryllium	0.0526	0.0020	mg/L	0.0625	ND	84.1	80-120	0.163	20	
Cadmium	0.0613	0.0010	mg/L	0.0625	ND	98.2	80-120	2.17	20	
Chromium	0.0642	0.0020	mg/L	0.0625	ND	103	80-120	1.92	20	
Cobalt	0.068	0.004	mg/L	0.0625	0.008	96.7	80-120	1.48	20	
Copper	0.058	0.003	mg/L	0.0625	ND	92.2	80-120	1.49	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	2.28	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	77.5	80-120	1.62	20	
Nickel	0.073	0.003	mg/L	0.0625	0.014	94.0	80-120	0.986	20	
Selenium	0.071	0.003	mg/L	0.0625	ND	114	80-120	1.51	20	
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120	1.99	20	
Zinc	0.08	0.02	mg/L	0.0625	0.02	95.1	80-120	3.72	20	
Matrix Spike Dup (BBD3692-MSD3) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:17										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	575	40.0	mg/L	6.25	496	NR	80-120	10.7	20	D2, M3
Iron	74.7	10.0	mg/L	6.25	60.7	223	80-120	10.2	20	D2, M1
Magnesium	202	20.0	mg/L	6.25	18.5	NR	80-120	10.0	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	120	26.0	mg/L	6.25	103	266	80-120	10.5	20	D2, M1
Matrix Spike Dup (BBD3692-MSD4) **Source: 2030127-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:23										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	496	40.0	mg/L	6.25	484	197	80-120	4.09	20	D2, M2
Iron	12.1	10.0	mg/L	6.25	5.32	109	80-120	4.02	20	D2
Magnesium	219	20.0	mg/L	6.25	210	152	80-120	4.06	20	D2, M3
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	43.1	26.0	mg/L	6.25	36.7	102	80-120	3.84	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3692 - EPA 200.2										
Post Spike (BBD3692-PS1) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/3/2022 12:55										
Antimony	68.1		ug/L	62.5	0.114	109	75-125			
Molybdenum	61.9		ug/L	62.5	2.65	94.7	75-125			
Mercury	2.44		ug/L	2.50	0.265	86.9	75-125			
Arsenic	71.5		ug/L	62.5	1.94	111	75-125			
Barium	70.6		ug/L	62.5	7.02	102	75-125			
Beryllium	50.7		ug/L	62.5	0.207	80.9	75-125			
Cadmium	64.9		ug/L	62.5	3.93	97.6	75-125			
Chromium	66.0		ug/L	62.5	0.440	105	75-125			
Cobalt	361		ug/L	62.5	299	99.2	75-125			
Copper	59.2		ug/L	62.5	-0.449	94.7	75-125			
Lead	61.5		ug/L	62.5	-0.006	98.3	75-115			
Lithium	178		ug/L	62.5	145	52.7	75-125			M2
Nickel	732		ug/L	62.5	662	112	75-125			
Selenium	67.4		ug/L	62.5	0.314	107	75-125			
Thallium	62.2		ug/L	62.5	0.233	99.1	75-125			
Zinc	1050		ug/L	62.5	925	192	75-125			
Post Spike (BBD3692-PS2) **Source: 2030111-01**										
Prepared: 4/30/2022 10:00, Analyzed: 5/6/2022 16:27										
Boron	349		ug/L	125	191	126	75-125			D2, M1
Calcium	544000		ug/L	6250	496000	778	75-125			D2, M3
Iron	71100		ug/L	6250	60700	166	75-125			D2, M1
Magnesium	193000		ug/L	6250	18500	NR	75-125			D2, M3
Potassium	15100		ug/L	6250	742	230	75-125			D2, M1
Sodium	113000		ug/L	6250	103000	164	75-125			D2, M1

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3534 - Default Prep Wet Chem										
Blank (BBD3534-BLK1)										
Prepared: 4/28/2022 14:29, Analyzed: 4/28/2022 14:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBD3534-BS1)										
Prepared: 4/28/2022 14:30, Analyzed: 4/28/2022 14:30										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
Duplicate (BBD3534-DUP1) **Source: 2030128-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	2610	1	umhos/cm		2620			0.306	0.938	
Duplicate (BBD3534-DUP2) **Source: 2030130-01**										
Prepared: 4/28/2022 14:33, Analyzed: 4/28/2022 14:33										
Specific Conductance (Lab)	3820	1	umhos/cm		3830			0.261	0.938	
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U

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Madisonville, KY 42431
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Total Alkalinity	251	4	mg/L	250		100	80-120			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3693 - Default Prep Wet Chem										
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0200 - Default Prep Wet Chem										
Blank (BBE0200-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:33										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0200-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:43										
Chemical Oxygen Demand	116	8	mg/L	125		92.6	90-110			
Duplicate (BBE0200-DUP1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	23	8	mg/L		26			12.1	25	
Matrix Spike (BBE0200-MS1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	293	8	mg/L	250	26	107	90-110			
Matrix Spike Dup (BBE0200-MSD1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	297	8	mg/L	250	26	108	90-110	1.22	10	
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Chloride	9.3		mg/L	10.0		92.6	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030116

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-10D Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mj

required information

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030116 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030116-01 A	4/27/22	920	Plastic 1L	1	MW-10D	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate Beryllium Tot 6020 Leac Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
2030116-01 B	4/27/22	920	Plastic 500mL pH<2 w/HNO3	1	MW-10D	g / c	
			Preservation Check: pH : ✓				
2030116-01 C	4/27/22	920	Plastic 500mL pH<2 w/H2SO4	1	MW-10D	g / c	COD TOC
			Preservation Check: pH : ✓				
2030116-01 D	4/27/22	920	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-10D	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
__ 181460057
Temp 1.9°C

Preservation Check Performed by: AH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 920

pH 7.11 Cond ~~(umho)~~ mS/cm 3.46 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.02 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mj	[signature]	4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:09:56PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-10D Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mitchell

required information

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030116 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030116-01 E	4/27/22	920	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-10D	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030116-01 F	4/27/22	920	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-10D	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030116-01 G	4/27/22	920	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-10D	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030116-01 H	4/27/22	920	AG 250mL pH<2 w/H2SO4	1	MW-10D	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: AL

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/27/22 Time (24 hr) 920

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mitchell	Mary Lan	4/27/22	1615

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:09:56PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 01, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
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SAMPLE SUMMARY

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30484715001	**2030116-01**	Water	04/27/22 09:20	04/29/22 10:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30484715001	**2030116-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

Sample: 2030116-01 **Lab ID: 30484715001** Collected: 04/27/22 09:20 Received: 04/29/22 10:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.277 ± 0.258 (0.340) C:NA T:94%**	pCi/L	05/24/22 15:31	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.35 ± 0.689 (1.21) C:76% T:76%**	pCi/L	05/19/22 15:54	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.63 ± 0.947 (1.55)**	pCi/L	06/01/22 12:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

QC Batch: 503356
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484715001

METHOD BLANK: 2437350 Matrix: Water
Associated Lab Samples: 30484715001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0383 ± 0.198 (0.460) C:NA T:90%	pCi/L	05/24/22 15:19	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

QC Batch: 503358
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30484715001

METHOD BLANK: 2437365 Matrix: Water
Associated Lab Samples: 30484715001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0517 ± 0.264 (0.628) C:84% T:91%	pCi/L	05/19/22 15:55	

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REPORT OF LABORATORY ANALYSIS

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(724)850-5600

QUALIFIERS

Project: 2030116/MW-10D Wilson 092-0000
Pace Project No.: 30484715

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30484715

30484715

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030116 Workorder Name: MW-10D Wilson 092-0000 Owner Received Date: 4/27/2022 Results Requested By: 5/~~10~~20/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 1S601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030116-01		04/27/22 09:20	IR44-McCoy	Water						X	X	601
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			MS	4/27/22 1005	
2					
3					

Cooler Temperature on Receipt 17.5 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30484715

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030116

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030116-01	**Water**	**Sampled:04/27/2022 09:20**	**Specific Method**	
Radium Total (sub)		10/24/2022 09:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/24/2022 09:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/24/2022 09:20	EPA 903.1	

Released By	Date	Received By	Date
[signature]	4-28-22	[signature] on Site	4-29-22 KIS
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30484715

Client Pace KY

Profile Number 11851

Site 2030116

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											2																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky

Project # 30484715

Label MJS
LIMS Login VP

Courier: ☐ Fed Ex ☑ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 1Z06H5701402657 92

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 17 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.5 °C Correction Factor: +0.0 °C Final Temp: 17.5 °C

Temp should be above freezing to 6°C

pH paper Lot# 100281 Date and Initials of person examining contents: MJS 5-8-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WA		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ A check in this box indicates that additional information has been stored in ereports.

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
2030113

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:45

Project Name:	MW-102 Wilson 092-00004	Workorder:	2030113

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030113-01	MW102/	Groundwater	04/28/2022 10:50	04/28/2022 14:04	Travis Sneed

LabNumber	Measurement	Value
2030113-01	Field Conductance	1230
	Field pH	6.59
	Field Temp (C)	16.52

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ANALYTICAL RESULTS

Lab Sample ID: **2030113-01**
Description: **MW102**

Sample Collection Date Time: 04/28/2022 10:50
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Arsenic	**0.0042**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Barium	**0.047**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:41	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Boron	ND	M1, M2, U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 11:58	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Calcium	**88.4**	D1, M1	mg/L	4.00	1.30	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:01	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Iron	**4.65**	M1	mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 11:58	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:41	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Magnesium	**46.2**	D1, M2	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:04	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:41	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Nickel	**0.002**	J	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Potassium	**2.01**	D, L1	mg/L	1.25	0.55	SW846 6010 B	05/19/2022 11:53	05/20/2022 15:59	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:41	DMH
Sodium	**155**	D1, M2	mg/L	26.0	10.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:04	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:55	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:41	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**441**		mg/L	4		2320 B-2011	05/04/2022 11:34	05/04/2022 11:34	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:34	05/04/2022 11:34	HMF
Total Alkalinity	**441**		mg/L	4		2320 B-2011	05/04/2022 11:34	05/04/2022 11:34	HMF
Chemical Oxygen Demand	**27**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:54	KBZ
Specific Conductance (Lab)	**1180**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**280**		mg/L	1	1	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**792**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.3**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 14:21	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.686**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.451**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**1.14**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**1.14**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**34.2**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/08/2022 23:34	05/08/2022 23:34	CSC
Fluoride	**0.29**		mg/L	0.20		EPA 300.0 REV 2.1	05/08/2022 23:34	05/08/2022 23:34	CSC
Sulfate	**245**	D	mg/L	10.0	5.0	EPA 300.0 REV 2.1	05/08/2022 23:54	05/08/2022 23:54	CSC

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Notes for work order 2030113

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE2373 - EPA 200.2										
Blank (BBE2373-BLK1)										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 12:39										
Potassium	ND	0.50	mg/L							U
Blank (BBE2373-BLK2)										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 15:49										
Potassium	ND	0.50	mg/L							U
LCS (BBE2373-BS1)										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 12:51										
Potassium	8.11	0.50	mg/L	6.25		130	85-115			L1
LCS (BBE2373-BS2)										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 15:54										
Potassium	8.17	0.50	mg/L	6.25		131	85-115			L1
Matrix Spike (BBE2373-MS1) **Source: 2030113-01RE1**										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 13:07										
Potassium	12.2	2.50	mg/L	6.25	2.01	164	80-120			D2, M1
Matrix Spike Dup (BBE2373-MSD1) **Source: 2030113-01RE1**										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 13:21										
Potassium	12.3	2.50	mg/L	6.25	2.01	164	80-120	0.0992	20	D2, M1
Post Spike (BBE2373-PS1) **Source: 2030113-01RE1**										
Prepared: 5/19/2022 11:53, Analyzed: 5/20/2022 13:25										
Potassium	12300		ug/L	6250	2010	165	75-125			D2, M1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1) **Source: 2030128-01**										
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Chloride	9.3		mg/L	10.0		92.6	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	

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270.821.7375
www.pacelabs.com

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030113

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-102 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030113 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030113-01 A	4-28-22	10:50	Plastic 1L	1	MW102	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030113-01 B	4-28-22	10:50	Plastic 500mL pH<2 w/HNO3	1	MW102	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030113-01 C	4-28-22	10:50	Plastic 500mL pH<2 w/H2SO4	1	MW102	g / c	COD TOC
			Preservation Check: pH : ✓				
2030113-01 D	4-28-22	10:50	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW102	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AW

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 10:50

pH 6.59 Cond (~~umho~~) 1.23 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 16.52 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	April Kirk	4-28-22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:08:34PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-102 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed
required information

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2030113 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030113-01 E	4-28-22	10:50	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW102	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030113-01 F	4-28-22	10:50	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW102	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030113-01 G	4-28-22	10:50	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW102	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030113-01 H	4-28-22	10:50	AG 250mL pH<2 w/H2SO4	1	MW102	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: AWL

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 10:50

pH 6.59 Cond (~~umho~~) 1.23 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.52 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	April Rich	4-28-22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:08:34PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487345001	**2030113-01**	Water	04/28/22 10:50	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487345001	**2030113-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

Sample: 2030113-01 **Lab ID: 30487345001** Collected: 04/28/22 10:50 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.686 ± 0.507 (0.687) C:NA T:89%**	pCi/L	06/02/22 14:15	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.451 ± 0.330 (0.641) C:79% T:93%**	pCi/L	05/31/22 15:07	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.14 ± 0.837 (1.33)**	pCi/L	06/09/22 15:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487345001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487345001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487345001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487345001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030113/MW-102 Wilson 092-0000
Pace Project No.: 30487345

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30487345

30487345

Pace Analytical
www.pacelabs.com

Workorder: 2030113 Workorder Name: MW-102 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030113-01		04/28/22 10:50	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	~~5-9-22 10:20~~	
2				5-3-22	JK 5-9-22
3				9:35	

Cooler Temperature on Receipt 18.0 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30487345

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030113

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030113-01	**Water**	**Sampled:04/28/2022 10:50**	**Specific Method**	
Radium Total (sub)		10/25/2022 10:50	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 10:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 10:50	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487345

Client Pace KY

Profile Number 11851

Site 2030113

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487345

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4939 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.9 °C Correction Factor: +0.1 °C Final Temp: 18 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	X	✓		5. No date/time on containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. PH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation ~~5-9-22 10:20~~ JK 5-9-22 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030114

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:42

Project Name:	MW-104 Wilson 092-00004	Workorder:	2030114

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030114-01	MW104/	Groundwater	04/28/2022 11:00	04/28/2022 14:04	Phillip Hill

LabNumber	Measurement	Value
2030114-01	Field Conductance	1320
	Field pH	6.24
	Field Temp (C)	16.51

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ANALYTICAL RESULTS

Lab Sample ID: **2030114-01**
Description: **MW104**

Sample Collection Date Time: 04/28/2022 11:00
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Arsenic	**0.0004**	J	mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Barium	**0.031**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:45	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:08	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Calcium	**312**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:14	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Copper	**0.001**	J	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Iron	**0.656**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:08	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:45	DMH
Lithium	**0.02**		mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Magnesium	**96.9**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:14	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:45	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Nickel	**0.001**	J	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Potassium	**3.93**	D1, L1	mg/L	2.50	1.10	SW846 6010 B	05/02/2022 08:12	05/09/2022 10:37	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:45	DMH
Sodium	**91.2**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:11	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 17:58	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:45	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**402**		mg/L	4		2320 B-2011	05/04/2022 11:41	05/04/2022 11:41	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:41	05/04/2022 11:41	HMF
Total Alkalinity	**402**		mg/L	4		2320 B-2011	05/04/2022 11:41	05/04/2022 11:41	HMF
Chemical Oxygen Demand	**28**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:54	KBZ
Specific Conductance (Lab)	**1880**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**960**	D	mg/L	2	2	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**1550**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.1**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 14:43	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.554**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.762**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**1.32**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.32**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**12.2**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 00:15	05/09/2022 00:15	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 00:15	05/09/2022 00:15	CSC
Sulfate	**630**	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/09/2022 00:35	05/09/2022 00:35	CSC

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Notes for work order 2030114

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	

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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Chloride	9.3		mg/L	10.0		92.6	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030114

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-104 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mott
required information

Compliance Monitoring? Yes X No
Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030114 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030114-01 A	4/28/22	1100	Plastic 1L	1	MW104	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030114-01 B	4/28/22	1100	Plastic 500mL pH<2 w/HNO3	1	MW104	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030114-01 C	4/28/22	1100	Plastic 500mL pH<2 w/H2SO4	1	MW104	g / c	COD TOC
			Preservation Check: pH : ✓				
2030114-01 D	4/28/22	1100	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW104	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: ____

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 1100

pH 6.24 Cond ~~(umho)~~ mS/cm 1.32 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 16.51 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mott	April Rice	4/28/22	1404

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:09:02PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-104 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY
Workorder # 2030114

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030114-01 E	4/28/22	1100	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW104	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030114-01 F	4/28/22	1100	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW104	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030114-01 G	4/28/22	1100	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW104	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030114-01 H	4/28/22	1100	AG 250mL pH<2 w/H2SO4	1	MW104	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: AMR

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 1100

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/28/22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:09:02PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487334001	**2030114-01**	Water	04/28/22 11:00	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487334001	**2030114-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

Sample: 2030114-01 **Lab ID: 30487334001** Collected: 04/28/22 11:00 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.554 ± 0.439 (0.597) C:NA T:91%**	pCi/L	06/02/22 13:55	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.762 ± 0.345 (0.561) C:80% T:97%**	pCi/L	05/31/22 15:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.32 ± 0.784 (1.16)**	pCi/L	06/09/22 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487334001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487334001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487334001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487334001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030114/MW-104 Wilson 092-0000
Pace Project No.: 30487334

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30487334

30487334

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030114 Workorder Name: MW-104 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030114-01		04/28/22 11:00	IR44-McCoy	Water						X	X	01
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature] K	5-9-22 9:57	JK 5-9-22
2				5-3-22	
3				9:35	

Cooler Temperature on Receipt 16.5 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030114

30487334

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 2030114-01 Water	**Sampled:04/28/2022 11:00**	**Specific Method**	
Radium Total (sub)	10/25/2022 11:00	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/25/2022 11:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/25/2022 11:00	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35

Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487334

Client Pace KY

Site 2030114

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

JK 5-9-22

Pace Analytical

Client Name: Pace Ky Project # 30487334

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other ____

Label MJS

Tracking #: 1Z 067 457 01 4139 9888

LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 16.5 / 16.4 °C Correction Factor: +0.1 °C Final Temp: 16.5 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. No Date/time on containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation ~~5-9-22 459~~ JK 5-9-22 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: ____ Date/Time: ____ Contacted By: ____

Comments/ Resolution: ____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Certificate of Analysis
2030115

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:40

Project Name:	MW-105R Wilson 092-00004	Workorder:	2030115

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030115-01	MW105/	Groundwater	04/28/2022 09:15	04/28/2022 14:04	Phillip Hill

LabNumber	Measurement	Value
2030115-01	Field Conductance	8640
	Field pH	6.38
	Field Temp (C)	14.87

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ANALYTICAL RESULTS

Lab Sample ID: **2030115-01**
Description: **MW105**

Sample Collection Date Time: 04/28/2022 09:15
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Arsenic	**0.0016**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Barium	**0.033**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:49	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:27	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Calcium	**214**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:33	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Iron	**3.97**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:27	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:49	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Magnesium	**66.7**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:33	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:49	DMH
Molybdenum	**0.005**	J	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Nickel	**0.057**		mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Potassium	**2.60**	D1, L1	mg/L	2.50	1.10	SW846 6010 B	05/02/2022 08:12	05/09/2022 10:40	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:49	DMH
Sodium	**42.0**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:30	MRWD
Thallium	**0.0001**	V1, J	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:08	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:49	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**400**		mg/L	4		2320 B-2011	05/04/2022 11:47	05/04/2022 11:47	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:47	05/04/2022 11:47	HMF
Total Alkalinity	**400**		mg/L	4		2320 B-2011	05/04/2022 11:47	05/04/2022 11:47	HMF
Chemical Oxygen Demand	**27**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:54	KBZ
Specific Conductance (Lab)	**1380**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**648**	D	mg/L	2	2	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**1800**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.0**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 15:04	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.807**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**1.05**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**1.86**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.86**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**12.2**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 01:36	05/09/2022 01:36	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 01:36	05/09/2022 01:36	CSC
Sulfate	**439**	D, M1	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/10/2022 19:43	05/10/2022 19:43	CSC

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Notes for work order 2030115

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Chloride	9.3		mg/L	10.0		92.6	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Batch BBE1261 - Default Prep IC										
Blank (BBE1261-BLK1)										
Prepared: 5/10/2022 15:49, Analyzed: 5/10/2022 15:49										
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
LCS (BBE1261-BS1)										
Prepared: 5/10/2022 15:25, Analyzed: 5/10/2022 15:25										
Chloride	21.4		mg/L	20.0		107	90-110			
Sulfate	79.9		mg/L	80.0		99.9	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE1261 - Default Prep IC										
Matrix Spike (BBE1261-MS1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 1:50, Analyzed: 5/11/2022 1:50										
Chloride	449		mg/L	400	14.0	109	80-120			D
Sulfate	1980		mg/L	1600	395	98.8	80-120			D
Matrix Spike Dup (BBE1261-MSD1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 2:14, Analyzed: 5/11/2022 2:14										
Chloride	548		mg/L	400	14.0	133	80-120	19.7	10	D, M1, Y2
Sulfate	2370		mg/L	1600	395	123	80-120	18.1	20	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Sample Acceptance Checklist for Work Order 2030115

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-105R Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030115 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030115-01 A	4/28/22	915	Plastic 1L	1	MW105	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
2030115-01 B	4/28/22	915	Plastic 500mL pH<2 w/HNO3	1	MW105	g / c	
			Preservation Check: pH : ✓				
2030115-01 C	4/28/22	915	Plastic 500mL pH<2 w/H2SO4	1	MW105	g / c	COD TOC
			Preservation Check: pH : ✓				
2030115-01 D	4/28/22	915	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW105	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: PW

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 915

pH 6.38 Cond ~~(umhos)~~ mS/cm 0.864 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.87 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	April Rich	4/28/22	1404

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:09:33PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-105R Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030115 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030115-01 E	4/28/22	915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW105	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030115-01 F	4/28/22	915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW105	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030115-01 G	4/28/22	915	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW105	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030115-01 H	4/28/22	915	AG 250mL pH<2 w/H2SO4	1	MW105	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.2 °C

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 915

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/28/22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:09:33PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487341001	**2030115-01**	Water	04/28/22 09:15	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487341001	**2030115-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

Sample: 2030115-01 **Lab ID: 30487341001** Collected: 04/28/22 09:15 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.807 ± 0.343 (0.0951) C:NA T:90%**	pCi/L	06/02/22 12:17	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.05 ± 0.555 (0.969) C:76% T:90%**	pCi/L	05/19/22 19:11	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.86 ± 0.898 (1.06)**	pCi/L	06/09/22 15:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

QC Batch: 503370
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487341001

METHOD BLANK: 2437407
Matrix: Water
Associated Lab Samples: 30487341001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0383 ± 0.291 (0.575) C:NA T:82%	pCi/L	06/02/22 11:40	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

QC Batch: 503371
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487341001

METHOD BLANK: 2437409
Matrix: Water
Associated Lab Samples: 30487341001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.261 ± 0.286 (0.596) C:86% T:82%	pCi/L	05/19/22 15:55	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030115/MW-105R Wilson 092-000
Pace Project No.: 30487341

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30487341

30487341

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030115 Workorder Name: MW-105R Wilson 092-000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030115-01		04/28/22 09:15	IR44-McCoy	Water						X	X	001
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			MSC	5/3/22 0935	
2					
3					

Cooler Temperature on Receipt 17.8 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

30487341

Pace Analytical Services, LLC Kentucky

2030115

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 2030115-01 **Water**	**Sampled:04/28/2022 09:15**	**Specific Method**	
Radium Total (sub)	10/25/2022 09:15	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/25/2022 09:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/25/2022 09:15	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487341

Client Pace KY

Site 203115

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487341

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.7 °C Correction Factor: +0.1 °C Final Temp: 17.8 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed MJS Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
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Certificate of Analysis
2030117

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:32

Project Name:	MW-110 Wilson 092-00004	Workorder:	2030117

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030117-01	MW110/	Groundwater	04/28/2022 08:30	04/28/2022 14:04	Phillip Hill

LabNumber	Measurement	Value
2030117-01	Field Conductance	3380
	Field pH	6.19
	Field Temp (C)	15.71

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ANALYTICAL RESULTS

Lab Sample ID: **2030117-01**
Description: **MW110**

Sample Collection Date Time: 04/28/2022 08:30
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Arsenic	**0.0029**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Barium	**0.057**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:53	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:36	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Calcium	**40.7**	D1	mg/L	4.00	1.30	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:39	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Iron	**5.23**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:36	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:53	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Magnesium	**22.8**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:42	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:53	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Nickel	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Potassium	**0.91**	L1	mg/L	0.50	0.22	SW846 6010 B	05/02/2022 08:12	05/18/2022 10:48	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:53	DMH
Sodium	**31.6**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:39	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:10	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:53	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**144**		mg/L	4		2320 B-2011	05/04/2022 11:58	05/04/2022 11:58	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 11:58	05/04/2022 11:58	HMF
Total Alkalinity	**144**		mg/L	4		2320 B-2011	05/04/2022 11:58	05/04/2022 11:58	HMF
Chemical Oxygen Demand	**31**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:54	KBZ
Specific Conductance (Lab)	**489**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**110**		mg/L	1	1	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**2590**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.9**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 15:46	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.339**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.255**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**0.594**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.594**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**11.4**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 03:19	05/09/2022 03:19	CSC
Fluoride	**0.23**		mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 03:19	05/09/2022 03:19	CSC
Sulfate	**94.6**	D	mg/L	10.0	5.0	EPA 300.0 REV 2.1	05/10/2022 20:08	05/10/2022 20:08	CSC

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Notes for work order 2030117

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Chloride	9.3		mg/L	10.0		92.6	90-110			
Matrix Spike (BBE0720-MS1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1)	**Source: 2030120-01**									
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Batch BBE1261 - Default Prep IC										
Blank (BBE1261-BLK1)										
Prepared: 5/10/2022 15:49, Analyzed: 5/10/2022 15:49										
Sulfate	ND	1.0	mg/L							U
LCS (BBE1261-BS1)										
Prepared: 5/10/2022 15:25, Analyzed: 5/10/2022 15:25										
Sulfate	79.9		mg/L	80.0		99.9	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE1261 - Default Prep IC										
Matrix Spike (BBE1261-MS1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 1:50, Analyzed: 5/11/2022 1:50										
Sulfate	1980		mg/L	1600	395	98.8	80-120			D
Matrix Spike Dup (BBE1261-MSD1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 2:14, Analyzed: 5/11/2022 2:14										
Sulfate	2370		mg/L	1600	395	123	80-120	18.1	20	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

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Sample Acceptance Checklist for Work Order 2030117

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-110 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mott
required information

Compliance Monitoring? Yes X No
Samples Chlorinated? Yes No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

LAB USE ONLY Workorder # 2030117 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030117-01 A	4/28/22	830	Plastic 1L	1	MW110	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030117-01 B	4/28/22	830	Plastic 500mL pH<2 w/HNO3	1	MW110	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030117-01 C	4/28/22	830	Plastic 500mL pH<2 w/H2SO4	1	MW110	g / c	COD TOC
			Preservation Check: pH : ✓				
2030117-01 D	4/28/22	830	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW110	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AMK

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 830

pH 6.19 Cond ~~(umho)~~ mS/cm 0.338 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 15.71 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mott	April Rich	4/28/22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:10:22PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-110 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030117 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030117-01 E	4/28/22	830	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW110	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030117-01 F	4/28/22	830	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW110	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030117-01 G	4/28/22	830	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW110	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030117-01 H	4/28/22	830	AG 250mL pH<2 w/H2SO4	1	MW110	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: AnK

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 830

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	April Rich	4/28/22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:10:22PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
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CERTIFICATIONS

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487332001	**2030117-01**	Water	04/28/22 08:30	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487332001	**2030117-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

Sample: 2030117-01 **Lab ID: 30487332001** Collected: 04/28/22 08:30 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.339 ± 0.416 (0.679) C:NA T:100%**	pCi/L	06/02/22 13:55	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.255 ± 0.332 (0.708) C:81% T:87%**	pCi/L	05/31/22 15:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.594 ± 0.748 (1.39)**	pCi/L	06/09/22 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487332001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487332001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487332001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487332001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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Greensburg, PA 15601
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QUALIFIERS

Project: 2030117/MW-110 Wilson 092-0000
Pace Project No.: 30487332

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30487332

30487332

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030117 Workorder Name: MW-110 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	2030117-01		04/28/22 08:30	IR44-McCoy	Water						X	X	01
3													
4													
5													
6													
7													
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	~~5-9-22 10:15~~	
2				5-3-22 9:35	JK 5-9-22
3					

Cooler Temperature on Receipt 17.2 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030117

30487332

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030117-01	**Water**	**Sampled:04/28/2022 08:30**	**Specific Method**	
Radium Total (sub)		10/25/2022 08:30	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 08:30	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 08:30	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487332

Client Pace KY

Site 203017

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487332

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.1 °C Correction Factor: +0.1 °C Final Temp: 17.2 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. No Date/Time on Containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation 5-9-22 10:15 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

JK 5-9-22

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
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Certificate of Analysis
2030118

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:48

Project Name:	MW-111 Wilson 092-00004	Workorder:	2030118

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030118-01	MW-111/	Groundwater	04/28/2022 09:10	04/28/2022 14:04	Travis Sneed

LabNumber	Measurement	Value
2030118-01	Field Conductance	3660
	Field pH	6.43
	Field Temp (C)	15.80

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ANALYTICAL RESULTS

Lab Sample ID: **2030118-01**
Description: **MW-111**

Sample Collection Date Time: 04/28/2022 09:10
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Arsenic	**0.0027**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Barium	**0.021**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:56	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Boron	**0.23**		mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:46	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Calcium	**627**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:52	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Cobalt	**0.011**		mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Iron	**11.9**	D1	mg/L	1.00	0.500	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:49	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:56	DMH
Lithium	**0.04**		mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Magnesium	**268**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/09/2022 10:49	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:56	DMH
Molybdenum	**0.003**	J	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Nickel	**0.012**		mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Potassium	**10.0**	D1, L1	mg/L	10.0	4.40	SW846 6010 B	05/02/2022 08:12	05/09/2022 10:46	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:56	DMH
Sodium	**84.5**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 12:49	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:13	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 15:56	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**579**		mg/L	4		2320 B-2011	05/04/2022 12:02	05/04/2022 12:02	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 12:02	05/04/2022 12:02	HMF
Total Alkalinity	**579**		mg/L	4		2320 B-2011	05/04/2022 12:02	05/04/2022 12:02	HMF
Chemical Oxygen Demand	**38**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:55	KBZ
Specific Conductance (Lab)	**3380**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**2410**	D	mg/L	5	5	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**304**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**3.0**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 16:07	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.612**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.895**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**3.8**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 04:00	05/09/2022 04:00	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 04:00	05/09/2022 04:00	CSC
Sulfate	**1800**	D, H2	mg/L	500	250	EPA 300.0 REV 2.1	06/11/2022 11:43	06/11/2022 11:43	CSC

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Notes for work order 2030118

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
H2	Initial analysis within holding time. Reanalysis was past holding time.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Madisonville, KY 42431
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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Total Alkalinity	358	4	mg/L		349			2.55	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Chloride	9.3		mg/L	10.0		92.6	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Batch BBE1261 - Default Prep IC										
Blank (BBE1261-BLK1)										
Prepared: 5/10/2022 15:49, Analyzed: 5/10/2022 15:49										
Sulfate	ND	1.0	mg/L							U
LCS (BBE1261-BS1)										
Prepared: 5/10/2022 15:25, Analyzed: 5/10/2022 15:25										
Sulfate	79.9		mg/L	80.0		99.9	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE1261 - Default Prep IC										
Matrix Spike (BBE1261-MS1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 1:50, Analyzed: 5/11/2022 1:50										
Sulfate	1980		mg/L	1600	395	98.8	80-120			D
Matrix Spike Dup (BBE1261-MSD1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 2:14, Analyzed: 5/11/2022 2:14										
Sulfate	2370		mg/L	1600	395	123	80-120	18.1	20	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Sample Acceptance Checklist for Work Order 2030118

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-111 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030118 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030118-01 A	4-28-22	9:10	Plastic 1L	1	MW-111	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030118-01 B	4-28-22	9:10	Plastic 500mL pH<2 w/HNO3	1	MW-111	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030118-01 C	4-28-22	9:10	Plastic 500mL pH<2 w/H2SO4	1	MW-111	g / c	COD TOC
			Preservation Check: pH : ✓				
2030118-01 D	4-28-22	9:10	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-111	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AVR

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 9:10

pH 6.43 Cond (~~umhos~~ mS) 3.66 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 15.8C or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	Cyril Roth	4.28.22	1484

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:10:40PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-111 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Snead *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030118 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030118-01 E	4-28-22	9:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030118-01 F	4-28-22	9:10	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030118-01 G	4-28-22	9:10	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-111	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030118-01 H	4-28-22	9:10	AG 250mL pH<2 w/H2SO4	1	MW-111	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.2 °C

Preservation Check Performed by: MK

Field data collected by: Travis Snead Date (mm/dd/yy) 4-28-22 Time (24 hr) 9:10

pH 6.43 Cond ~~(umho)~~ 3.66 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 18.50 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Snead		4-28-22	1484

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:10:40PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487338001	**2030118-01**	Water	04/28/22 09:10	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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SAMPLE ANALYTE COUNT

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487338001	**2030118-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

Sample: 2030118-01 **Lab ID: 30487338001** Collected: 04/28/22 09:10 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments:
- The sampler's name and signature were not listed on the COC.
- Sample collection dates and times were not present on the sample containers.
- Upon receipt at the laboratory, 2.5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.612 ± 0.694 (1.08) C:NA T:87%**	pCi/L	05/20/22 12:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.895 ± 0.592 (1.10) C:77% T:73%**	pCi/L	05/25/22 18:48	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.51 ± 1.29 (2.18)**	pCi/L	06/09/22 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

QC Batch: 503710
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487338001

METHOD BLANK: 2439264
Matrix: Water
Associated Lab Samples: 30487338001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.543 ± 0.385 (0.740) C:77% T:85%	pCi/L	05/25/22 15:53	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

QC Batch: 503709
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487338001

METHOD BLANK: 2439261 Matrix: Water
Associated Lab Samples: 30487338001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0112 ± 0.361 (0.724) C:NA T:91%	pCi/L	05/20/22 12:00	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030118/MW-111 Wilson 092-0000
Pace Project No.: 30487338

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30487338

30487338

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030118 Workorder Name: MW-111 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030118-01		04/28/22 09:10	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			MSD	5-3-22 0435	
2					
3					

Cooler Temperature on Receipt 17.2 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30487338

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030118

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030118-01	**Water**	**Sampled:04/28/2022 09:10**	**Specific Method**	
Radium Total (sub)		10/25/2022 09:10	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 09:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 09:10	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35

Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487338

Client Pace KY

Site 2030118

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487338

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.1 °C Correction Factor: +0.1 °C Final Temp: 17.2 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. No date/time on containers
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ /	/ ✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. added 2.5mL of HNO3 to each container to get a pH<2
All containers meet method preservation requirements.		✓		Initial when completed MJS Date/time of preservation 5-9-22 0915 Lot # of added preservative DL 22-0473
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓ / ✓	18.
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MJS Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030119

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 15:34

Project Name:	MW-112 Wilson 092-00004	Workorder:	2030119

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030119-01	MW-112/	Groundwater	04/28/2022 07:25	04/28/2022 14:04	Travis Sneed

LabNumber	Measurement	Value
2030119-01	Field Conductance	1320
	Field pH	6.35
	Field Temp (C)	13.94

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ANALYTICAL RESULTS

Lab Sample ID: **2030119-01**
Description: **MW-112**

Sample Collection Date Time: 04/28/2022 07:25
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Arsenic	**0.0013**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Barium	**0.028**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:00	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Boron	**0.15**		mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:05	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Calcium	**250**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:11	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Cobalt	**0.004**		mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Iron	**2.10**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:05	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:00	DMH
Lithium	**0.01**	J	mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Magnesium	**71.2**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:11	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:00	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Nickel	**0.005**		mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Potassium	**4.60**	D1, L1	mg/L	4.00	1.76	SW846 6010 B	05/02/2022 08:12	05/17/2022 17:16	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:00	DMH
Sodium	**12.7**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:08	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:15	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:00	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**329**		mg/L	4		2320 B-2011	05/04/2022 12:11	05/04/2022 12:11	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 12:11	05/04/2022 12:11	HMF
Total Alkalinity	**329**		mg/L	4		2320 B-2011	05/04/2022 12:11	05/04/2022 12:11	HMF
Chemical Oxygen Demand	**37**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:55	KBZ
Specific Conductance (Lab)	**1320**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**688**	D	mg/L	2	2	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**1040**	C6, H2	mg/L	25	25	2540 C-2011	06/10/2022 10:17	06/10/2022 10:17	HAG
Total Organic Carbon	**2.7**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 16:28	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.049**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.124**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium	**0.173**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.173**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**4.7**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 05:42	05/09/2022 05:42	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 05:42	05/09/2022 05:42	CSC
Sulfate	**512**	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/10/2022 20:56	05/10/2022 20:56	CSC

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Notes for work order 2030119

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
C6	Quantitative confirmation performed. Sample ran twice.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
H2	Initial analysis within holding time. Reanalysis was past holding time.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	
Total Alkalinity	358	4	mg/L		349			2.55	10	

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBF1342 - Default Prep Wet Chem										
Blank (BBF1342-BLK1)										
Prepared: 6/10/2022 10:17, Analyzed: 6/10/2022 10:17										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBF1342-BS1)										
Prepared: 6/10/2022 10:17, Analyzed: 6/10/2022 10:17										
Total Dissolved Solids	1450	25	mg/L	1500		96.6	80-120			
Duplicate (BBF1342-DUP1) **Source: 2061150-01**										
Prepared: 6/10/2022 10:17, Analyzed: 6/10/2022 10:17										
Total Dissolved Solids	490	25	mg/L		482			1.65	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Chloride	9.3		mg/L	10.0		92.6	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Batch BBE1261 - Default Prep IC										
Blank (BBE1261-BLK1)										
Prepared: 5/10/2022 15:49, Analyzed: 5/10/2022 15:49										
Sulfate	ND	1.0	mg/L							U
LCS (BBE1261-BS1)										
Prepared: 5/10/2022 15:25, Analyzed: 5/10/2022 15:25										
Sulfate	79.9		mg/L	80.0		99.9	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE1261 - Default Prep IC										
Matrix Spike (BBE1261-MS1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 1:50, Analyzed: 5/11/2022 1:50										
Sulfate	1980		mg/L	1600	395	98.8	80-120			D
Matrix Spike Dup (BBE1261-MSD1) **Source: 2030115-01RE1**										
Prepared: 5/11/2022 2:14, Analyzed: 5/11/2022 2:14										
Sulfate	2370		mg/L	1600	395	123	80-120	18.1	20	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

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Sample Acceptance Checklist for Work Order 2030119

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-112 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2030119 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030119-01 A	4-28-22	7:25	Plastic 1L	1	MW-112	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030119-01 B	4-28-22	7:25	Plastic 500mL pH<2 w/HNO3	1	MW-112	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030119-01 C	4-28-22	7:25	Plastic 500mL pH<2 w/H2SO4	1	MW-112	g / c	COD TOC
			Preservation Check: pH : ✓				
2030119-01 D	4-28-22	7:25	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-112	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: KW

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 7:25

pH 6.85 Cond ~~umho~~ mS 1.32 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 13.94 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	April Rich	4-28-22	1404

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:11:11PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-112 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed
required information

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030119 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030119-01 E	4-28-22	7:25	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030119-01 F	4-28-22	7:25	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030119-01 G	4-28-22	7:25	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-112	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030119-01 H	4-28-22	7:25	AG 250mL pH<2 w/H2SO4	1	MW-112	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
181460057
Temp 1.2 °C

Preservation Check Performed by: AM

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 7:25

pH 6.35 Cond ~~(umho)~~ mS 1.32 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 13.94 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	April Rich	4-28-22	1404

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:11:11PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487339001	**2030119-01**	Water	04/28/22 07:25	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487339001	**2030119-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

Sample: 2030119-01 **Lab ID: 30487339001** Collected: 04/28/22 07:25 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• The sampler's name and signature were not listed on the COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0492 ± 0.224 (0.457) C:NA T:98%**	pCi/L	06/02/22 14:15	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.124 ± 0.297 (0.663) C:72% T:87%**	pCi/L	05/31/22 15:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.173 ± 0.521 (1.12)**	pCi/L	06/09/22 15:51	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487339001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487339001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487339001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487339001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
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QUALIFIERS

Project: 2030119/MW-112 Wilson 092-0000
Pace Project No.: 30487339

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30487339

30487339

Pace Analytical
www.pacelabs.com

Workorder: 2030119 Workorder Name: MW-112 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030119-01		04/28/22 07:25	IR44-McCoy	Water		X	X	01
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	~~5-9-22 9:45~~	JK 5-9-22
2				5-3-22	
3				9:35	

Cooler Temperature on Receipt 17.2 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30487339

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030119

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis	Expires	Laboratory ID	Comments
Sample ID: 2030119-01 **Water**	**Sampled:04/28/2022 07:25**	**Specific Method**	
Radium Total (sub)	10/25/2022 07:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	10/25/2022 07:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	10/25/2022 07:25	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487339

Client Pace KY

Site 2030119

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487339

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJ

Tracking #: 1Z 067 457 01 4139 9888

LIMS Login VP

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 16.6 °C Correction Factor: +0.1 °C Final Temp: 16.7 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. NO Date/time on containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation ~~5-3-22 9:35~~ JK 5-9-22 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Madisonville, KY 42431
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Certificate of Analysis
2030120

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:21

Project Name:	MW-113 Wilson 092-00004	Workorder:	2030120

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030120-01	MW-113/	Groundwater	04/28/2022 07:20	04/28/2022 14:04	Phillip Hill

LabNumber	Measurement	Value
2030120-01	Field pH	6.17
	Field Temp (C)	15.70

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ANALYTICAL RESULTS

Lab Sample ID: **2030120-01**
Description: **MW-113**

Sample Collection Date Time: 04/28/2022 07:20
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	**0.002**	J	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Arsenic	**0.0116**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Barium	**0.053**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:04	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:14	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Calcium	**206**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:20	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Cobalt	**0.037**		mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Iron	**2.90**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:14	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:04	DMH
Lithium	**0.04**		mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Magnesium	**79.5**	D1	mg/L	2.00	0.900	SW846 6010 B	05/02/2022 08:12	05/09/2022 11:05	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:04	DMH
Molybdenum	**0.02**		mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Nickel	**0.056**		mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Potassium	**5.22**	D1, L1	mg/L	5.00	2.20	SW846 6010 B	05/02/2022 08:12	05/09/2022 11:05	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:04	DMH
Sodium	**92.2**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:17	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:17	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:04	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**352**	M3	mg/L	4		2320 B-2011	05/04/2022 12:17	05/04/2022 12:17	HMF
Carbonate Alkalinity as CaCO3	ND	M3, U	mg/L	4		2320 B-2011	05/04/2022 12:17	05/04/2022 12:17	HMF
Total Alkalinity	**352**	M3	mg/L	4		2320 B-2011	05/04/2022 12:17	05/04/2022 12:17	HMF
Chemical Oxygen Demand	**36**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:55	KBZ
Specific Conductance (Lab)	**1700**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**840**	D	mg/L	5	5	2340 C (as HACH 8226)	05/09/2022 12:32	05/09/2022 12:32	CLL
Total Dissolved Solids	**1200**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**2.6**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 18:35	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.350**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.626**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**0.976**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.976**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**35.0**		mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/09/2022 06:23	05/09/2022 06:23	CSC
Fluoride	**0.22**		mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 06:23	05/09/2022 06:23	CSC
Sulfate	**557**	D, M1	mg/L	50.0	25.0	EPA 300.0 REV 2.1	05/09/2022 07:04	05/09/2022 07:04	CSC

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Notes for work order 2030120

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	M2, D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1) **Source: 2030128-01**										
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0605 - Default Prep Wet Chem										
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			
Batch BBE0969 - Default Prep Wet Chem										
Blank (BBE0969-BLK1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0969-BS1)										
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	228	1	mg/L	225		101	80-120			
Duplicate (BBE0969-DUP1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	172	1	mg/L		170			1.17	10	
Matrix Spike (BBE0969-MS1)	**Source: 2051728-01**									
Prepared: 5/9/2022 12:32, Analyzed: 5/9/2022 12:32										
Hardness as CaCO3	476	1	mg/L	318	170	96.2	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0720 - Default Prep IC										
Blank (BBE0720-BLK1)										
Prepared: 5/8/2022 21:11, Analyzed: 5/8/2022 21:11										
Fluoride	ND	0.20	mg/L							U
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
LCS (BBE0720-BS1)										
Prepared: 5/8/2022 20:51, Analyzed: 5/8/2022 20:51										
Fluoride	9.53		mg/L	10.0		95.3	90-110			
Chloride	9.3		mg/L	10.0		92.6	90-110			
Sulfate	9.0		mg/L	10.0		90.2	90-110			
Matrix Spike (BBE0720-MS1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:24, Analyzed: 5/9/2022 7:24										
Chloride	40.4		mg/L	10.0	31.5	89.3	80-120			
Sulfate	559		mg/L	10.0	502	571	80-120			M1
Fluoride	8.78		mg/L	10.0	0.20	85.8	80-120			
Matrix Spike Dup (BBE0720-MSD1) **Source: 2030120-01**										
Prepared: 5/9/2022 7:45, Analyzed: 5/9/2022 7:45										
Sulfate	572		mg/L	10.0	502	701	80-120	2.31	20	M1
Chloride	41.3		mg/L	10.0	31.5	98.4	80-120	2.22	10	
Fluoride	9.04		mg/L	10.0	0.20	88.5	80-120	3.02	20	

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P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030120

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-113 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mott
required information

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2030120 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030120-01 A	4/28/22	720	Plastic 1L	1	MW-113	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030120-01 B	4/28/22	720	Plastic 500mL pH<2 w/HNO3	1	MW-113	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030120-01 C	4/28/22	720	Plastic 500mL pH<2 w/H2SO4	1	MW-113	g / c	COD TOC
			Preservation Check: pH : ✓				
2030120-01 D	4/28/22	780	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-113	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/28/22 Time (24 hr) 720

pH 6.17 Cond ~~(umho)~~ mS/cm ___ Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 15.70 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mott	April Rock	4/28/22	1404

☐ PACE- Check here if trip charge applied to associated COC

Printed: 2/1/2022 3:11:34PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-113 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No X

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030120 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030120-01 E	4/25/22	720	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-113	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030120-01 F	4/25/22	720	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-113	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030120-01 G	4/25/22	720	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-113	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030120-01 H	4/25/22	720	AG 250mL pH<2 w/H2SO4	1	MW-113	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: PH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/25/22 Time (24 hr) 720

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	Ayn Rich	4/25/22	1104

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:11:34PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487335001	**2030120-01**	Water	04/28/22 07:20	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487335001	**2030120-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

Sample: 2030120-01 **Lab ID: 30487335001** Collected: 04/28/22 07:20 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.350 ± 0.486 (0.822) C:NA T:90%**	pCi/L	06/02/22 13:55	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.626 ± 0.377 (0.695) C:77% T:88%**	pCi/L	05/31/22 15:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.976 ± 0.863 (1.52)**	pCi/L	06/09/22 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487335001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487335001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487335001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487335001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030120/MW-113 Wilson 092-0000
Pace Project No.: 30487335

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30487335

30487335

Pace Analytical
www.pacelabs.com

Workorder: 2030120 Workorder Name: MW-113 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030120-01		04/28/22 07:20	IR44-McCoy	Water		X	X	01
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			[signature]	~~5-9-22 10:05~~	JK 5-9-22
2				5-3-22	
3				9:35	

Cooler Temperature on Receipt 16.9 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30487335

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030120

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030120-01	**Water**	**Sampled:04/28/2022 07:20**	**Specific Method**	
Radium Total (sub)		10/25/2022 07:20	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 07:20	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 07:20	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487335

Client Pace KY

Site 2030120

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487335

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 16.8 °C Correction Factor: +0.1 °C Final Temp: 16.9 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. No Date/time on containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation ~~5-9-22 1005~~ JK 5-9-22 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
2030121

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:14

Project Name:	MW-114 Wilson 092-00004	Workorder:	2030121

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2030121-01	MW-114/	Groundwater	04/28/2022 12:15	04/28/2022 14:04	Travis Sneed

LabNumber	Measurement	Value
2030121-01	Field Conductance	9420
	Field pH	6.69
	Field Temp (C)	17.33

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ANALYTICAL RESULTS

Lab Sample ID: **2030121-01**
Description: **MW-114**

Sample Collection Date Time: 04/28/2022 12:15
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Arsenic	**0.0025**		mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Barium	**0.067**		mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:07	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:24	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Calcium	**115**	D1	mg/L	40.0	13.0	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:30	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Iron	**0.751**		mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:24	MRWD
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:07	DMH
Lithium	**0.02**		mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Magnesium	**29.2**	D1	mg/L	20.0	9.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:30	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:07	DMH
Molybdenum	**0.007**	J	mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Nickel	**0.004**		mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Potassium	**2.51**	D1, L1	mg/L	2.50	1.10	SW846 6010 B	05/02/2022 08:12	05/09/2022 11:11	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:07	DMH
Sodium	**72.8**	D1	mg/L	2.60	1.00	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:27	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:19	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:07	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	**313**		mg/L	4		2320 B-2011	05/04/2022 12:49	05/04/2022 12:49	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 12:49	05/04/2022 12:49	HMF
Total Alkalinity	**313**		mg/L	4		2320 B-2011	05/04/2022 12:49	05/04/2022 12:49	HMF
Chemical Oxygen Demand	**32**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 10:55	KBZ
Specific Conductance (Lab)	**968**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	**436**	D	mg/L	2	2	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
Total Dissolved Solids	**1510**		mg/L	50	50	2540 C-2011	04/29/2022 14:38	04/29/2022 14:38	HAG
Total Organic Carbon	**1.1**		mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:34	05/07/2022 18:55	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**0.237**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**1.27**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
Radium	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**40.0**	D	mg/L	2.5	1.8	EPA 300.0 REV 2.1	05/09/2022 19:31	05/09/2022 19:31	CSC
Fluoride	**0.22**		mg/L	0.20		EPA 300.0 REV 2.1	05/09/2022 19:16	05/09/2022 19:16	CSC
Sulfate	**138**	D	mg/L	100	50.0	EPA 300.0 REV 2.1	05/09/2022 19:47	05/09/2022 19:47	CSC

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Notes for work order 2030121

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D	Results reported from dilution.
D1	Sample required dilution due to high concentration of target analyte.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Blank (BBD3545-BLK1)										
Prepared: 5/4/2022 11:14, Analyzed: 5/4/2022 11:14										
Total Alkalinity	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK2)										
Prepared: 5/4/2022 12:40, Analyzed: 5/4/2022 12:40										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Blank (BBD3545-BLK3)										
Prepared: 5/4/2022 14:10, Analyzed: 5/4/2022 14:10										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBD3545-BS1)										
Prepared: 5/4/2022 12:35, Analyzed: 5/4/2022 12:35										
Bicarbonate Alkalinity as CaCO3	41	4	mg/L	0.00			0-200			
Total Alkalinity	236	4	mg/L	250		94.6	80-120			
Carbonate Alkalinity as CaCO3	195	4	mg/L	0.00			0-200			
LCS (BBD3545-BS2)										
Prepared: 5/4/2022 14:06, Analyzed: 5/4/2022 14:06										
Carbonate Alkalinity as CaCO3	198	4	mg/L	0.00			0-200			
Bicarbonate Alkalinity as CaCO3	53	4	mg/L	0.00			0-200			
Total Alkalinity	251	4	mg/L	250		100	80-120			
Duplicate (BBD3545-DUP1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:23, Analyzed: 5/4/2022 12:23										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	358	4	mg/L		349			2.55	10	
Bicarbonate Alkalinity as CaCO3	358	4	mg/L		349			2.55	10	

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Madisonville, KY 42431
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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3545 - Default Prep Wet Chem										
Duplicate (BBD3545-DUP2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:50, Analyzed: 5/4/2022 13:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Bicarbonate Alkalinity as CaCO3	497	4	mg/L		496			0.0403	10	
Total Alkalinity	497	4	mg/L		496			0.0403	10	
Matrix Spike (BBD3545-MS1)	**Source: 2030128-01**									
Prepared: 5/4/2022 12:29, Analyzed: 5/4/2022 12:29										
Total Alkalinity	360	4	mg/L	50.0	349	22.2	80-120			M3
Matrix Spike (BBD3545-MS2)	**Source: 2030130-01**									
Prepared: 5/4/2022 13:58, Analyzed: 5/4/2022 13:58										
Total Alkalinity	498	4	mg/L	50.0	496	2.20	80-120			M3
Batch BBD3693 - Default Prep Wet Chem										
Blank (BBD3693-BLK1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3693-BS1)										
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1450	25	mg/L	1500		96.5	80-120			
Duplicate (BBD3693-DUP1)	**Source: 2023857-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	396	50	mg/L		404			2.00	10	
Duplicate (BBD3693-DUP2)	**Source: 2030129-01**									
Prepared: 4/29/2022 14:38, Analyzed: 4/29/2022 14:38										
Total Dissolved Solids	1470	50	mg/L		1470			0.272	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0115 - Default Prep Wet Chem										
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1)	**Source: 2044799-02**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2)	**Source: 2045131-03**									
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0202 - Default Prep Wet Chem										
Blank (BBE0202-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0202-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:50										
Chemical Oxygen Demand	128	8	mg/L	125		103	90-110			
Duplicate (BBE0202-DUP1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:58										
Chemical Oxygen Demand	26	8	mg/L		33			25.7	25	Y1
Matrix Spike (BBE0202-MS1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	109	90-110			
Matrix Spike Dup (BBE0202-MSD1)	**Source: 2041847-06**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 10:59										
Chemical Oxygen Demand	304	8	mg/L	250	33	108	90-110	0.300	10	
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0605 - Default Prep Wet Chem										
Blank (BBE0605-BLK1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:36										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0605-BS1)										
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 12:15										
Total Organic Carbon	5.0	0.5	mg/L	5.00		100	80-120			
Duplicate (BBE0605-DUP1)	**Source: 2030118-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 17:52										
Total Organic Carbon	3.0	0.5	mg/L		3.0			0.118	25	
Duplicate (BBE0605-DUP2)	**Source: 2030128-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:08										
Total Organic Carbon	1.6	0.5	mg/L		1.6			2.17	25	
Matrix Spike (BBE0605-MS1)	**Source: 2030119-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 18:14										
Total Organic Carbon	5.0	0.5	mg/L	2.50	2.7	93.1	80-120			
Matrix Spike (BBE0605-MS2)	**Source: 2030129-01**									
Prepared: 5/5/2022 11:34, Analyzed: 5/7/2022 23:29										
Total Organic Carbon	7.9	0.5	mg/L	5.00	3.2	94.5	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0721 - Default Prep IC										
Blank (BBE0721-BLK1)										
Prepared: 5/9/2022 18:19, Analyzed: 5/9/2022 18:19										
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
Fluoride	ND	0.20	mg/L							U
LCS (BBE0721-BS1)										
Prepared: 5/9/2022 18:04, Analyzed: 5/9/2022 18:04										
Fluoride	10.4		mg/L	10.0		104	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Sulfate	9.9		mg/L	10.0		98.9	90-110			
Matrix Spike (BBE0721-MS1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:29, Analyzed: 5/10/2022 3:29										
Fluoride	1.00		mg/L	10.0	0.11	8.90	80-120			M2
Chloride	189		mg/L	10.0	312	NR	80-120			M2
Sulfate	1710		mg/L	10.0	3430	NR	80-120			M2
Matrix Spike Dup (BBE0721-MSD1) **Source: 2030130-01**										
Prepared: 5/10/2022 3:45, Analyzed: 5/10/2022 3:45										
Fluoride	0.93		mg/L	10.0	0.11	8.15	80-120	7.78	20	M2
Chloride	183		mg/L	10.0	312	NR	80-120	2.94	10	M2
Sulfate	1670		mg/L	10.0	3430	NR	80-120	2.66	20	M2

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2030121

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-114 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Snead *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2030121 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030121-01 A	4-28-22	12:15	Plastic 1L	1	MW-114	g / c	TDS Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate
2030121-01 B	4-28-22	12:15	Plastic 500mL pH<2 w/HNO3	1	MW-114	g / c	Beryllium Tot 6020 Lead Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Barium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Iron Tot 6010B Lithium Tot 6020 Magnesium Tot 6010B
			Preservation Check: pH : ✓				
2030121-01 C	4-28-22	12:15	Plastic 500mL pH<2 w/H2SO4	1	MW-114	g / c	COD TOC
			Preservation Check: pH : ✓				
2030121-01 D	4-28-22	12:15	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-114	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AM

Field data collected by: Travis Snead Date (mm/dd/yy) 4-28-22 Time (24 hr) 12:15

pH 6.69 Cond ~~(umho)~~ mS 1.942 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.33 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Snead	April Rich	4-28-22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:11:55PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 03/07/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: MW-114 Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419

Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419

PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2030121 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2030121-01 E	4-28-22	12:15	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-114	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030121-01 F	4-28-22	12:15	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-114	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2030121-01 G	4-28-22	12:15	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-114	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2030121-01 H	4-28-22	12:15	AG 250mL pH<2 w/H2SO4	1	MW-114	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: AM

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 12:15

pH 6.69 Cond (~~umho~~) MS 1942 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 17.33 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4-28-22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 2/1/2022 3:11:55PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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CERTIFICATIONS

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
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SAMPLE SUMMARY

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487336001	**2030121-01**	Water	04/28/22 12:15	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487336001	**2030121-01**	EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

Sample: 2030121-01 **Lab ID: 30487336001** Collected: 04/28/22 12:15 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.237 ± 0.286 (0.437) C:NA T:96%**	pCi/L	06/02/22 14:15	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.27 ± 0.442 (0.613) C:78% T:93%**	pCi/L	05/31/22 15:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.51 ± 0.728 (1.05)**	pCi/L	06/09/22 15:48	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

QC Batch: 503410
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487336001

METHOD BLANK: 2437473 Matrix: Water
Associated Lab Samples: 30487336001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.780 ± 0.313 (0.462) C:85% T:93%	pCi/L	05/31/22 11:54	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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Greensburg, PA 15601
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

QC Batch: 503409
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487336001

METHOD BLANK: 2437472 Matrix: Water
Associated Lab Samples: 30487336001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0395 ± 0.232 (0.517) C:NA T:96%	pCi/L	06/02/22 13:31	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2030121/MW-114 Wilson 092-0000
Pace Project No.: 30487336

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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WO# : 30487336

30487336

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 2030121 Workorder Name: MW-114 Wilson 092-0000 Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-737S rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2030121-01		04/28/22 12:15	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			Jayleen K	~~5-9-22 9:45~~	
2				5-3-22	JK 5-9-22
3				9:35	

Cooler Temperature on Receipt 16.7 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30487336

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2030121

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2030121-01	**Water**	**Sampled:04/28/2022 12:15**	**Specific Method**	
Radium Total (sub)		10/25/2022 12:15	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 12:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 12:15	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5-3-22 9:35
Released By	Date	Received By	Date

30487336

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

Client Pace KY

Site 2030121

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserved
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
1	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487332

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 17.1 °C Correction Factor: +0.1 °C Final Temp: 17.2 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D2811 Date and Initials of person examining contents: MJS 5-9-22

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: Wt	✓	✓		5. NO Date/time on containers JK 5-9-22
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK Date/time of preservation ~~5-9-22~~ JK 5-9-22 Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK Date: 5-9-22 Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
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Certificate of Analysis
2044990

Diana Merritt
Big Rivers Electric Corporation Wilson Station
PO Box 24
Henderson, KY 42419

Customer ID: 44-100168
Report Printed: 06/13/2022 09:11

Project Name:	Field Blank Wilson 092-00004	Workorder:	2044990

Dear Diana Merritt

Enclosed are the analytical results for samples received by the laboratory 04/28/2022 14:04.

The results relate to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services LLC Kentucky - Madisonville

If you have any questions concerning this report, please feel free to contact me.

#460210 Madisonville, KY
#460291 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
2044990-01	Field Blank/	Water	04/28/2022 12:35	04/28/2022 14:04	Travis Sneed

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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **2044990-01**
Description: **Field Blank**

Sample Collection Date Time: 04/28/2022 12:35
Sample Received Date Time: 04/28/2022 14:04

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:11	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:42	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:42	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:42	MRWD
Lead	**0.0007**	J	mg/L	0.002	0.0005	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:11	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Magnesium	ND	U	mg/L	0.200	0.090	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:42	MRWD
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:11	DMH
Molybdenum	**0.01**		mg/L	0.01	0.002	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Nickel	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Potassium	ND	L1, U	mg/L	0.50	0.22	SW846 6010 B	05/02/2022 08:12	05/09/2022 11:15	MRWD
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:11	DMH
Sodium	ND	U	mg/L	0.26	0.10	SW846 6010 B	05/02/2022 08:12	05/07/2022 13:42	MRWD
Thallium	ND	V1, U	mg/L	0.0020	0.0001	SW846-6020 A	05/02/2022 08:12	05/06/2022 18:22	NKP
Zinc	ND	U	mg/L	0.02	0.02	SW846-6020 A	05/02/2022 08:12	05/16/2022 16:11	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 14:39	05/04/2022 14:39	HMF
Carbonate Alkalinity as CaCO3	ND	U	mg/L	4		2320 B-2011	05/04/2022 14:39	05/04/2022 14:39	HMF
Total Alkalinity	ND	U	mg/L	4		2320 B-2011	05/04/2022 14:39	05/04/2022 14:39	HMF
Chemical Oxygen Demand	**24**		mg/L	8	8	HACH 8000	05/04/2022 07:22	05/04/2022 09:50	KBZ
Specific Conductance (Lab)	**6**		umhos/cm	1	1	2510 B-2011	05/02/2022 15:21	05/02/2022 15:21	JLW
Hardness as CaCO3	ND	U	mg/L	1	1	2340 C (as HACH 8226)	05/05/2022 12:24	05/05/2022 12:24	CLL
pH (Lab)	**5.90**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	05/02/2022 16:20	05/02/2022 16:20	CML
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	04/29/2022 15:11	04/29/2022 15:11	HAG
Total Organic Carbon	ND	U	mg/L	0.5	0.4	5310 C-2011	05/05/2022 11:39	05/08/2022 13:11	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	**-0.135**	_Sub	pCi/L			EPA 903.1	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.329**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

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Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium	**0.329**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW
See Attached Subcontract Report	**0.329**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	06/10/2022 16:39	06/10/2022 16:44	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	0.5	0.4	EPA 300.0 REV 2.1	05/18/2022 01:50	05/18/2022 01:50	CSC
Fluoride	ND	U	mg/L	0.20		EPA 300.0 REV 2.1	05/23/2022 16:08	05/23/2022 16:08	CSC
Sulfate	ND	U	mg/L	1.0	0.5	EPA 300.0 REV 2.1	05/18/2022 01:50	05/18/2022 01:50	CSC

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Notes for work order 2044990

- Samples collected by PACE personnel are done so in accordance with procedures set forth in PACE field services SOPs .
- Results contained in this report are only representative of the samples received.
- PACE does not provide interpretation of these results unless otherwise stated .
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identification based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.

Qualifiers

_Sub	See subcontractors report.
D2	Sample required dilution due to matrix interference.
E	Concentration exceeds calibration range
H3	Sample received and analyzed past holding time.
J	Estimated value.
L1	The associated blank spike recovery was above method acceptance limits.
M1	Matrix spike recovery was high; the method control sample recovery was acceptable.
M2	Matrix spike recovery was low; the method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).
V1	CCV recovery was above method acceptance limits. This target analyte not detected in the sample.
Y1	Sample RPD exceeded the method control limit.
Y2	MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Blank (BBD3695-BLK1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:36										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Magnesium	ND	0.200	mg/L							U
Potassium	ND	0.50	mg/L							U
Sodium	ND	0.26	mg/L							U
Blank (BBD3695-BLK3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:47										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	ND	0.003	mg/L							U
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Nickel	ND	0.003	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U
Zinc	0.005	0.02	mg/L							J
Blank (BBD3695-BLK4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:27										
Potassium	ND	0.50	mg/L							U

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
LCS (BBD3695-BS1)										
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 11:49										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.26	0.40	mg/L	6.25		100	85-115			
Iron	6.11	0.100	mg/L	6.25		97.7	85-115			
Magnesium	5.32	0.200	mg/L	6.25		85.2	85-115			
Potassium	8.23	0.50	mg/L	6.25		132	85-115			L1
Sodium	6.27	0.26	mg/L	6.25		100	85-115			
LCS (BBD3695-BS3)										
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 17:49										
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0027	0.0005	mg/L	0.00250		110	85-115			
Antimony	0.067	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0626	0.0010	mg/L	0.0625		100	85-115			
Barium	0.059	0.004	mg/L	0.0625		94.8	85-115			
Beryllium	0.0591	0.0020	mg/L	0.0625		94.5	85-115			
Cadmium	0.0626	0.0010	mg/L	0.0625		100	85-115			
Chromium	0.0606	0.0020	mg/L	0.0625		96.9	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		98.7	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.9	85-115			
Lead	0.070	0.002	mg/L	0.0625		112	85-115			
Lithium	0.06	0.02	mg/L	0.0625		100	85-115			
Nickel	0.062	0.003	mg/L	0.0625		98.5	85-115			
Selenium	0.063	0.003	mg/L	0.0625		101	85-115			
Thallium	0.0685	0.0020	mg/L	0.0625		110	85-115			
Zinc	0.07	0.02	mg/L	0.0625		109	85-115			
LCS (BBD3695-BS4)										
Prepared: 5/2/2022 8:12, Analyzed: 5/9/2022 10:30										
Potassium	8.63	0.50	mg/L	6.25		138	85-115			L1

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Metals by SW846 6000 Series Methods Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike (BBD3695-MS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:01										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	104	40.0	mg/L	6.25	88.4	251	80-120			D2, M1
Iron	12.5	10.0	mg/L	6.25	ND	200	80-120			D2, M1
Magnesium	52.0	20.0	mg/L	6.25	46.2	92.5	80-120			D2
Potassium	ND	50.0	mg/L	6.25	ND		80-120			D2, M2, U
Sodium	159	26.0	mg/L	6.25	155	50.3	80-120			D2, M2
Matrix Spike (BBD3695-MS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:41										
Antimony	0.070	0.005	mg/L	0.0625	ND	112	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120			
Arsenic	0.0703	0.0010	mg/L	0.0625	0.0042	106	80-120			
Barium	0.104	0.004	mg/L	0.0625	0.047	91.7	80-120			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	80-120			
Cadmium	0.0624	0.0010	mg/L	0.0625	ND	99.9	80-120			
Chromium	0.0609	0.0020	mg/L	0.0625	ND	97.4	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	91.3	80-120			
Lead	0.069	0.002	mg/L	0.0625	ND	110	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	97.6	80-120			
Nickel	0.061	0.003	mg/L	0.0625	0.002	94.3	80-120			
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120			
Thallium	0.0685	0.0020	mg/L	0.0625	ND	110	80-120			
Zinc	0.07	0.02	mg/L	0.0625	0.005	98.5	80-120			
Matrix Spike Dup (BBD3695-MSD1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:05										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	101	40.0	mg/L	6.25	88.4	205	80-120	2.79	20	D2, M1
Iron	12.1	10.0	mg/L	6.25	ND	194	80-120	3.05	20	D2, M1
Magnesium	50.3	20.0	mg/L	6.25	46.2	66.3	80-120	3.19	20	D2, M2
Potassium	ND	50.0	mg/L	6.25	ND		80-120		20	D2, M2, U
Sodium	154	26.0	mg/L	6.25	155	NR	80-120	2.95	20	D2, M2

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3695 - EPA 200.2										
Matrix Spike Dup (BBD3695-MSD3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:43										
Mercury	0.0027	0.0005	mg/L	0.00250	ND	107	80-120	0.261	20	
Antimony	0.069	0.005	mg/L	0.0625	ND	111	80-120	1.30	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	1.62	20	
Arsenic	0.0683	0.0010	mg/L	0.0625	0.0042	103	80-120	2.88	20	
Barium	0.103	0.004	mg/L	0.0625	0.047	89.8	80-120	1.16	20	
Beryllium	0.0553	0.0020	mg/L	0.0625	ND	88.4	80-120	3.14	20	
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.9	80-120	1.02	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	2.17	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.8	80-120	2.73	20	
Copper	0.056	0.003	mg/L	0.0625	ND	88.9	80-120	2.74	20	
Lead	0.068	0.002	mg/L	0.0625	ND	108	80-120	1.95	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	95.4	80-120	2.23	20	
Nickel	0.059	0.003	mg/L	0.0625	0.002	90.9	80-120	3.58	20	
Selenium	0.065	0.003	mg/L	0.0625	ND	104	80-120	0.272	20	
Thallium	0.0670	0.0020	mg/L	0.0625	ND	107	80-120	2.34	20	
Zinc	0.06	0.02	mg/L	0.0625	0.005	94.2	80-120	4.11	20	
Post Spike (BBD3695-PS1)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/7/2022 14:08										
Boron	204		ug/L	125	27.4	141	75-125			D2, M1
Calcium	97500		ug/L	6250	88400	146	75-125			D2, M1
Iron	11700		ug/L	6250	4650	113	75-125			D2
Magnesium	48400		ug/L	6250	46200	35.1	75-125			D2, M2
Potassium	7930		ug/L	6250	2080	93.7	75-125			D2
Sodium	150000		ug/L	6250	155000	NR	75-125			D2, M2
Post Spike (BBD3695-PS3)	**Source: 2030113-01**									
Prepared: 5/2/2022 8:12, Analyzed: 5/6/2022 18:45										
Mercury	2.70		ug/L	2.50	0.0055	108	75-125			
Antimony	68.6		ug/L	62.5	0.062	110	75-125			
Molybdenum	66.5		ug/L	62.5	1.20	104	75-125			
Arsenic	69.6		ug/L	62.5	4.24	105	75-125			
Barium	106		ug/L	62.5	47.0	93.9	75-125			
Beryllium	55.5		ug/L	62.5	0.0230	88.8	75-125			
Cadmium	62.4		ug/L	62.5	0.0100	99.9	75-125			
Chromium	60.4		ug/L	62.5	0.356	96.1	75-125			
Cobalt	62.2		ug/L	62.5	2.40	95.7	75-125			
Copper	57.4		ug/L	62.5	-0.770	91.9	75-125			
Lead	68.0		ug/L	62.5	-0.003	109	75-115			
Lithium	60.4		ug/L	62.5	2.05	93.3	75-125			
Nickel	60.6		ug/L	62.5	1.88	93.9	75-125			
Selenium	65.5		ug/L	62.5	0.018	105	75-125			
Thallium	67.0		ug/L	62.5	0.0130	107	75-125			
Zinc	65.1		ug/L	62.5	5.25	95.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBD3699 - Default Prep Wet Chem										
Blank (BBD3699-BLK1)										
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	ND	25	mg/L							U
LCS (BBD3699-BS1)										
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	1480	25	mg/L	1500		98.4	80-120			
Duplicate (BBD3699-DUP1) **Source: 2030130-01**										
Prepared: 4/29/2022 15:11, Analyzed: 4/29/2022 15:11										
Total Dissolved Solids	3500	50	mg/L		3510			0.343	10	
Batch BBE0115 - Default Prep Wet Chem										
Blank (BBE0115-BLK1)										
Prepared: 5/2/2022 15:20, Analyzed: 5/2/2022 15:20										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (BBE0115-BS1)										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (BBE0115-DUP1) **Source: 2044799-02**										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	361	1	umhos/cm		358			0.834	0.938	
Duplicate (BBE0115-DUP2) **Source: 2045131-03**										
Prepared: 5/2/2022 15:21, Analyzed: 5/2/2022 15:21										
Specific Conductance (Lab)	252	1	umhos/cm		255			1.18	0.938	Y1
Batch BBE0134 - Default Prep Wet Chem										
LCS (BBE0134-BS1)										
Prepared: 5/2/2022 16:20, Analyzed: 5/2/2022 16:20										
pH (Lab)	8.01		Std. Units	8.00		100	98.8-101.2			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0134 - Default Prep Wet Chem										
Duplicate (BBE0134-DUP1)	**Source: 2051735-01**									
Prepared: 5/2/2022 16:20, Analyzed: 5/2/2022 16:20										
pH (Lab)	8.10	0.10	Std. Units		8.09			0.124	10	H3
Batch BBE0200 - Default Prep Wet Chem										
Blank (BBE0200-BLK1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:33										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (BBE0200-BS1)										
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:43										
Chemical Oxygen Demand	116	8	mg/L	125		92.6	90-110			
Duplicate (BBE0200-DUP1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	23	8	mg/L		26			12.1	25	
Matrix Spike (BBE0200-MS1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	293	8	mg/L	250	26	107	90-110			
Matrix Spike Dup (BBE0200-MSD1)	**Source: 2030123-01**									
Prepared: 5/4/2022 7:22, Analyzed: 5/4/2022 9:52										
Chemical Oxygen Demand	297	8	mg/L	250	26	108	90-110	1.22	10	
Batch BBE0214 - Default Prep Wet Chem										
Blank (BBE0214-BLK1)										
Prepared: 5/4/2022 14:28, Analyzed: 5/4/2022 14:28										
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Total Alkalinity	ND	4	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0214 - Default Prep Wet Chem										
Blank (BBE0214-BLK2)										
Prepared: 5/4/2022 15:01, Analyzed: 5/4/2022 15:01										
Total Alkalinity	ND	4	mg/L							U
Bicarbonate Alkalinity as CaCO3	ND	4	mg/L							U
Carbonate Alkalinity as CaCO3	ND	4	mg/L							U
LCS (BBE0214-BS1)										
Prepared: 5/4/2022 14:57, Analyzed: 5/4/2022 14:57										
Bicarbonate Alkalinity as CaCO3	51	4	mg/L	0.00			0-200			
Carbonate Alkalinity as CaCO3	194	4	mg/L	0.00			0-200			
Total Alkalinity	245	4	mg/L	250		98.1	80-120			
Duplicate (BBE0214-DUP1)	**Source: 2050935-01**									
Prepared: 5/4/2022 14:50, Analyzed: 5/4/2022 14:50										
Carbonate Alkalinity as CaCO3	ND	4	mg/L		ND				10	U
Total Alkalinity	54	4	mg/L		55			1.64	10	
Bicarbonate Alkalinity as CaCO3	54	4	mg/L		54			0.00	10	
Matrix Spike (BBE0214-MS1)	**Source: 2050935-01**									
Prepared: 5/4/2022 14:53, Analyzed: 5/4/2022 14:53										
Total Alkalinity	98	4	mg/L	50.0	55	84.4	80-120			
Batch BBE0538 - Default Prep Wet Chem										
Blank (BBE0538-BLK1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	ND	1	mg/L							U
LCS (BBE0538-BS1)										
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	222	1	mg/L	225		98.7	80-120			
Duplicate (BBE0538-DUP1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	262	1	mg/L		258			1.54	10	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE0538 - Default Prep Wet Chem										
Matrix Spike (BBE0538-MS1)	**Source: 2023857-01**									
Prepared: 5/5/2022 12:24, Analyzed: 5/5/2022 12:24										
Hardness as CaCO3	600	1	mg/L	318	258	108	80-120			
Batch BBE0607 - Default Prep Wet Chem										
Blank (BBE0607-BLK1)										
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 12:08										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (BBE0607-BS1)										
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 12:29										
Total Organic Carbon	4.9	0.5	mg/L	5.00		98.5	80-120			
Duplicate (BBE0607-DUP1)	**Source: 2050506-01**									
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 18:27										
Total Organic Carbon	3.1	0.5	mg/L		3.2			2.87	25	
Duplicate (BBE0607-DUP2)	**Source: 2051067-01**									
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 20:54										
Total Organic Carbon	2.9	0.5	mg/L		2.9			1.33	25	
Matrix Spike (BBE0607-MS1)	**Source: 2050506-02**									
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 18:48										
Total Organic Carbon	4.1	0.5	mg/L	2.50	1.8	93.4	80-120			
Matrix Spike (BBE0607-MS2)	**Source: 2051067-02**									
Prepared: 5/5/2022 11:39, Analyzed: 5/8/2022 21:15										
Total Organic Carbon	6.7	0.5	mg/L	5.00	2.0	94.9	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE1743 - Default Prep IC										
Blank (BBE1743-BLK1)										
Prepared: 5/13/2022 16:56, Analyzed: 5/13/2022 16:56										
Fluoride	ND	0.20	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1.0	mg/L							U
LCS (BBE1743-BS1)										
Prepared: 5/13/2022 16:41, Analyzed: 5/13/2022 16:41										
Fluoride	9.74		mg/L	10.0		97.4	90-110			
Sulfate	9.2		mg/L	10.0		92.4	90-110			
Chloride	9.2		mg/L	10.0		92.2	90-110			
Matrix Spike (BBE1743-MS1) **Source: 2044990-01**										
Prepared: 5/13/2022 20:47, Analyzed: 5/13/2022 20:47										
Sulfate	14.3		mg/L	10.0	0.0	143	80-120			M1
Chloride	14.2		mg/L	10.0	0.0	142	80-120			M1
Fluoride	14.4		mg/L	10.0	0.00	144	80-120			M1
Matrix Spike Dup (BBE1743-MSD1) **Source: 2044990-01**										
Prepared: 5/13/2022 21:02, Analyzed: 5/13/2022 21:02										
Sulfate	16.4		mg/L	10.0	0.0	164	80-120	13.5	20	M1
Fluoride	16.2		mg/L	10.0	0.00	162	80-120	11.9	20	M1
Chloride	15.9		mg/L	10.0	0.0	159	80-120	11.8	10	M1, Y2
Batch BBE2094 - Default Prep IC										
Blank (BBE2094-BLK1)										
Prepared: 5/17/2022 22:35, Analyzed: 5/17/2022 22:35										
Sulfate	ND	1.0	mg/L							U
Chloride	ND	0.5	mg/L							U
LCS (BBE2094-BS1)										
Prepared: 5/17/2022 22:10, Analyzed: 5/17/2022 22:10										
Sulfate	73.8		mg/L	80.0		92.2	90-110			
Chloride	18.6		mg/L	20.0		92.9	90-110			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch BBE2094 - Default Prep IC										
Matrix Spike (BBE2094-MS1) **Source: 2041847-01**										
Prepared: 5/18/2022 3:28, Analyzed: 5/18/2022 3:28										
Chloride	34.4		mg/L	8.00	25.9	105	80-120			
Sulfate	40.3		mg/L	32.0	1.8	120	80-120			
Matrix Spike Dup (BBE2094-MSD1) **Source: 2041847-01**										
Prepared: 5/18/2022 3:52, Analyzed: 5/18/2022 3:52										
Sulfate	40.4		mg/L	32.0	1.8	121	80-120	0.302	20	M1
Chloride	33.9		mg/L	8.00	25.9	99.7	80-120	1.34	10	
Batch BBE2744 - Default Prep IC										
Blank (BBE2744-BLK1)										
Prepared: 5/23/2022 15:42, Analyzed: 5/23/2022 15:42										
Fluoride	ND	0.20	mg/L							U
LCS (BBE2744-BS1)										
Prepared: 5/23/2022 15:21, Analyzed: 5/23/2022 15:21										
Fluoride	9.56		mg/L	10.0		95.6	90-110			
Matrix Spike (BBE2744-MS1) **Source: 2052173-01RE1**										
Prepared: 5/23/2022 19:53, Analyzed: 5/23/2022 19:53										
Fluoride	5.83		mg/L	4.00	0.67	129	80-120			M1
Matrix Spike Dup (BBE2744-MSD1) **Source: 2052173-01RE1**										
Prepared: 5/23/2022 20:14, Analyzed: 5/23/2022 20:14										
Fluoride	4.92		mg/L	4.00	0.67	106	80-120	16.9	20	

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Certified Analyses included in this Report

Analyte	Certifications
2320 B-2011 in Water	
Bicarbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Carbonate Alkalinity as CaCO3	KY Drinking Water Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
Total Alkalinity	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2340 C (as HACH 8226) in Water	
Hardness as CaCO3	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) VA NELAC MDV (460210)
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 AK Drinking Water MADV (KY00020)
EPA 300.0 REV 2.1 in Water	
Chloride	KY Drinking Water Mdv (00030) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431 VA NELAC MDV (460210)
Fluoride	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) IN Drinking Water Mdv (C-KY-02) KY Wastewater Mdv (00030) WV Drinking Water Mdv (9959 M) TN Drinking Water (02819) ADEM Drinking Water Mdv (41880) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
Sulfate	KY Drinking Water Mdv (00030) VA NELAC MDV (460210) KY Wastewater Mdv (00030) TN Drinking Water (02819) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
SW846 6010 B in Water	
Calcium	VA NELAC MDV (460210)

Sample Acceptance Checklist for Work Order 2044990

Shipped By: Client

Temperature: 1.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/27/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: Field Blank Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 2044990 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2044990-01 E	4-28-22	12:35	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Field Blank	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2044990-01 F	4-28-22	12:35	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	Field Blank	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
2044990-01 G	4-28-22	12:35	Plastic 1L pH<2 w/HNO3 (Sub)	1	Field Blank	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
2044990-01 H	4-28-22	12:35	AG 250mL pH<2 w/H2SO4	1	Field Blank	g / c	TOC
			Preservation Check: pH : ✓				

Thermometer Serial Number
✓ 181390287
___ 181460057
Temp 1.2 °C

Preservation Check Performed by: _____

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 12:35

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	April Reel	4-28-22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 4/27/2022 4:11:28PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/27/2022

Client: Big Rivers Electric Corporation Wilson Station

Project: Field Blank Wilson 092-00004

Report To:
Big Rivers Electric Corporation Wilson Station
Mike Galbraith
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: Ky

Invoice To:
Big Rivers Electric Corporation Wilson Station
Brian Edwards
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): Travis Sneed
required information

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ✓

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

LAB USE ONLY Workorder # 2044990 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
2044990-01 A	4-26-22	12:35	Plastic 1L	1	Field Blank	g / c	Alkalinity Bicarbonate Alkalinity Carbonate Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 pH (Lab) Sulfate 300.0 TDS Thallium Tot 6020 Antimony Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Lithium Tot 6020 Zinc Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Hardness Titration Beryllium Tot 6020 Lead Tot 6020 Barium Tot 6020
2044990-01 B	4-26-22	12:35	Plastic 500mL pH<2 w/HNO3	1	Field Blank	g / c	
			Preservation Check: pH : ✓				
2044990-01 C	4-26-22	12:35	Plastic 500mL pH<2 w/H2SO4	1	Field Blank	g / c	COD TOC
			Preservation Check: pH : ✓				
2044990-01 D	4-26-22	12:35	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Field Blank	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AM

Field data collected by: Travis Sneed Date (mm/dd/yy) 4-28-22 Time (24 hr) 12:35

pH Blank Cond (umho) ___ Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) ___ or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
Travis Sneed	April Rich	4.28.22	1404

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 4/27/2022 4:11:28PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

June 09, 2022

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Amber D. Carr
amber.carr@pacelabs.com
(724)850-5600
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30487342001	**2044990-01**	Water	04/28/22 12:35	05/03/22 09:35

REPORT OF LABORATORY ANALYSIS

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1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30487342001	**2044990-01**	EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

Sample: 2044990-01 **Lab ID: 30487342001** Collected: 04/28/22 12:35 Received: 05/03/22 09:35 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • The sampler's name and signature were not listed on the COC.
• Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.135 ± 0.187 (0.475) C:NA T:92%**	pCi/L	06/02/22 13:01	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.329 ± 0.302 (0.608) C:77% T:92%**	pCi/L	05/20/22 14:52	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.329 ± 0.489 (1.08)**	pCi/L	06/09/22 15:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

QC Batch: 503375
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487342001

METHOD BLANK: 2437422 Matrix: Water
Associated Lab Samples: 30487342001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.390 ± 0.357 (0.722) C:70% T:90%	pCi/L	05/20/22 14:50	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

QC Batch: 503373
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30487342001

METHOD BLANK: 2437417 Matrix: Water
Associated Lab Samples: 30487342001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0996 ± 0.235 (0.435) C:NA T:90%	pCi/L	06/02/22 12:17	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 2044990/Field Blank Wilson 092
Pace Project No.: 30487342

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

Act - Activity

Unc - Uncertainty: For Safe Drinking Water Act (SDWA) analyses, the reported Unc. Is the calculated Count Uncertainty (95% confidence interval) using a coverage factor of 1.96. For all other matrices (non-SDWA), the reported Unc. is the calculated Expanded Uncertainty (aka Combined Standard Uncertainty, CSU), reported at the 95% confidence interval using a coverage factor of 1.96.

Gamma Spec: The Unc. reported for all gamma-spectroscopy analyses (EPA 901.1), is the calculated Expanded Uncertainty (CSU) at the 95.4% confidence interval, using a coverage factor of 2.0.

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

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Chain of Custody

WO# : 30487342

30487342

Pace Analytical
www.pacelabs.com

Workorder: 2044990 Workorder Name: Field Blank Wilson 092-00(Owner Received Date: 4/28/2022 Results Requested By: 5/23/2022

Report To:	Subcontract To:
Pace Analytical Services, LLC 825 Industrial Road Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	2044990-01		04/28/22 12:35	IR44-McCoy	Water		X	X	01
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			Jayden Moore	~~5-3 22 9:35~~	JK 5-9-22
2				5-3-22	
3				9:35	

Cooler Temperature on Receipt 16.7 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

2044990

3048742

SENDING LABORATORY:

Pace Analytical Services, LLC Kentucky
PO BOX 907
Madisonville, KY 42431
Phone: (270) 821-7375
Fax: 844-270-7904
Project Manager: Rob Whittington

RECEIVING LABORATORY:

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
Phone :(724) 850-5615
Fax:

Analysis		Expires	Laboratory ID	Comments
Sample ID: 2044990-01	**Water**	**Sampled:04/28/2022 12:35**	**Specific Method**	
Radium Total (sub)		10/25/2022 12:35	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/25/2022 12:35	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/25/2022 12:35	EPA 903.1	

Released By	Date	Received By	Date
[signature]	5-2-22	[signature]	5.3.22 9:35
Released By	Date	Received By	Date

Pace Analytical®

Pace Greensburg Lab -Sample Container Count

30487342

Client Pace KY

Site 2044990

Profile Number 11851

Notes

Sample Line Item	Matrix	AG1H	AG1S	AG1T	AG2U	AG3S	AG3U	AG5U	AG5T	BG1U	BG2U	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	GCUB	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	
1	WT											3																	
2																													
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unprserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosul
GJN	1 Gallon Jug	VG9H	40mL clear VOA vial HCl
AG1S	1L amber glass H2SO4	JGFU	4oz amber wide jar
AG1H	1L amber glass HCl	WGFU	4oz wide jar unpreserved
AG1T	1L amber glass Na Thiosulfate	BG2U	500mL clear glass unpreserved
BG1U	1L clear glass unpreserved	AG2U	500mL amber glass unpreserve
AG3S	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
AG3U	250mL amber glass unpreserved		

Plastic / Misc.

GCUB	1 Gallon Cubitainer
12GN	1/2 Gallon Cubitainer
SP5T	120mL Coliform Na Thiosulfate
BP1N	1L plastic HNO3
BP1U	1L plastic unpreserved
BP3S	250mL plastic H2SO4
BP3N	250mL plastic HNO3
BP3U	250mL plastic unpreserved
BP3C	250ml plastic NAOH
BP2S	500mL plastic H2SO4
BP2U	500mL plastic unpreserved

EZI	5g Encore
VOAK	Kit for Volatile Solid
I	Wipe/Swab
ZPLC	Ziploc Bag

WT	Water
SL	Solid
OL	Non-aqueous liquid
WP	Wipe

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace Ky Project # 30487342

Courier: ☐ Fed Ex ☒ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label MJS
LIMS Login VP

Tracking #: 1Z 067 457 01 4139 9888

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Thermometer Used 18 Type of Ice: (Wet) Blue None melted

Cooler Temperature Observed Temp 16.6 °C Correction Factor: +0.1 °C Final Temp: 16.7 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D2811 / Date and Initials of person examining contents: MJS 5-9-22
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5. NO Date/time on containers ~~5-8~~ 5-9-22 JK
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed JK / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JK / Date: 5-9-22 / Survey Meter SN: 1563

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

APPENDIX E –DATA VALIDATION

Memorandum

Date: July 12, 2022

To: Christopher Hoglund

From: Nikhil Khatri

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
BREC Wilson, Ohio County, Kentucky
Project No. 145762

Water samples were collected at the BREC Wilson Landfill Site in Ohio county, Kentucky on April 27 and April 28, 2022. The samples were analyzed by Pace Analytical Services of Madisonville, Kentucky (Pace Madisonville) or Pace Analytical of Greensburg, Pennsylvania (Pace Greensburg) for one or more of the following parameters:

Parameter	Analytical Method	Laboratory
Metals	SW846 6010 B SW846 6020 A	Pace - Madisonville
Total Dissolved Solids (TDS)	2540 C-2011	
Anions chloride, fluoride, sulfate	EPA 300.0 REV 2.1	
Total Organic Carbon (TOC)	5310 C-2011	
Alkalinity (bicarbonate/carbonate alkalinity as CaCO3 and total alkalinity)	2320 B-2011	
Hardness as CaCO3	2340 C (as HACH 8226)	
Specific Conductance	2510 B-2011	
Chemical Oxygen Demand (COD)	HACH Method 8000	
Radium *total calculated from radium-226 + radium-228 analyses.	EPA 903.1 EPA 904 Total Radium by calculation	Pace - Greensburg

Each sample location was reported in its own single data set with its associated QC results. Due to the overlap in sample dates for this event, several of the QC are associated with several samples across multiple data sets. To avoid redundancy, these are summarized by batching in this review. For the radium samples, Pace-Madisonville forwarded these to Pace-Greensburg.

The QA/QC results in association with the samples collected were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in United States Environmental Protection Agency's (USEPA's) *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI, 2020). The QA/QC review results are discussed below, and qualifiers added during this review are summarized on Table 1.

1. Chain-of-Custody (COC) –The relinquished and received signatures, times, and dates were present on the COC for all samples sent to Pace-Madisonville. For the COC associated with the radium samples sent from Pace-Madisonville to Pace-Greensburg, the COC signatures were not present. All samples arrived with no issues, and were analyzed for radium as requested.

2. Requested Analyses Completed – All analyses were completed as requested.

3. Holding Times –The analysis for TDS for sample MW-112 was performed outside its holding time. Because of this, the laboratory analyzed this sample twice to confirm the results. The laboratory flagged the result as 'C6' to indicate this confirmation analysis; this qualifier was dropped for final reporting of the data. The TDS detection was qualified as estimated potential low bias (J-) to account for the exceeded holding time.

   All other samples/analyses were completed within their recommended holding time.

4. Sample Preservation – All samples were received by Pace-Madisonville slightly below the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C. Since the samples were not in frozen state, the requested analyses were completed. All radium samples were received by Pace-Greensburg between 16 and 19 °C. The radium samples did not require a thermal preservation, and no further actions were necessary.

5. Field Blank – Field blanks assess the potential for cross-contamination during the sample activities and/or transport. For this review, the field blank was associated with samples collected from MW-114 on 04/28/2022. The following field blank detections were noted during this review:

   - Lead, molybdenum, COD, specific conductance and total radium (radium-228) were detected in sample Field blank (Lab ID: 2044990-01). Any low-level (J-flagged) detections of these analytes in associated sample MW-114 less than five times the respective field blank concentration were qualified as non-detect (JU), while any detections greater than the reporting limit (RL) but less than five times the blank concentration were qualified as estimated potential high bias (J+). The exception is for radium, in which estimated (J) qualifiers were added due to the uncertainty associated with these analytes. The following summarizes the review of these analytes:

     - Sample MW-114was non-detect for lead; therefore, no qualifiers were required.

     - Sample MW-114 yielded a low-level (J-flagged) molybdenum, which was qualified as non-detect (JU).

     - Sample MW-114 yielded a COD detection over the RL but less than five times the field blank concentration, and was qualified as estimated potential high bias (J+).

     - Sample MW-114 yielded a specific conductivity detection greater than five times the field blank concentration; hence, no qualifier was required.

- Radium-226 and radium-228 were both considered detections in the field blank since there is uncertainty in their reported concentrations Sample MW-114 yielded radium-226, radium-228 and total radium detections over the RL but less than five times the field blank and was qualified as estimated (J).

6. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses. The following method blank detections were noted during this review:

- Copper and zinc were detected at low levels (J-flagged) in the laboratory blank for QC batch BBD3692. As noted previously, this QC batch applied to several data sets. The following associated samples were less than five times the respective method blank detection and qualified as noted (see also Table 1 for all qualifications added):

  - Copper: Samples MW-4 and MW-2 had low-level (J-flagged) detections less than their RL, and were qualified as estimated at the reporting limit (JU).

  - Zinc: Samples MW-3, MW-5, MW-10D, MW-2, MW-7 and Well Duplicate had detections less than the RL, and were qualified as estimated at trace concentration (JU).

- Zinc was detected at a low level (J-flagged) in the laboratory blank for QC batch BBD3695. All associated samples (MW-110, MW-112, MW-113, MW-114, Field Blank, MW-102, MW-104, MW-105R and MW-111) were non-detect and no qualifications were necessary.

- Radium: Radium-226 and radium-228 were detected in all method blanks. Because of the uncertainty associated with radium results, the review criteria was slightly altered to account for this. For any associated radium-226 or radium-228 detection less than five times the corresponding method blank concentration plus its uncertainty, the respective result was qualified as estimated (J). Additionally, because this result was used in the calculation to report total radium, the total radium result for said sample was also qualified as estimated (J).

  The following samples were qualified as noted based on this method blank review:

  - MW-3 – radium-226 and total radium
  - MW-4D – radium-226 and total radium
  - MW-5 – radium-226 and total radium
  - Well Duplicate – radium-226 and total radium
  - MW-7 – radium-226 and total radium
  - MW-10 – radium-228 and total radium
  - MW-102- radium-228 and total radium

- MW-104- radium-228 and total radium
- MW-110- radium-226, radium-228 and total radium
- MW-105R- radium-226, radium-228 and total radium
- MW-111- radium-226, radium-228 and total radium
- MW-112- radium-226, radium-228 and total radium
- MW-113- radium-226, radium-228 and total radium

7. Laboratory Control Samples (LCS) – 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 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. In some instances, the lab also performed laboratory control sample duplicates. The following LCS/LCSD results were outside their respective control limits, and qualified as noted (see also Table 1 for all qualifications added).

   - One or more LCS/LCSD RECs for magnesium in QC batch BBD3692 were below the QC limit. All associated samples MW-3, MW-4, MW-4D, MW-5, MW-6, MW-8, Well Duplicate, MW-1, MW-10, MW-10D, MW-2, and MW-7 had detections and were qualified as estimated potential low bias (J-) for this analyte.

   - One or more LCS RECs for potassium in QC batch BBD 3692 exceeded the QC limit. Samples MW-3, MW-4, MW-4D, MW-5, MW-8, Well Duplicate, MW-1, MW-10, MW-10D, MW-2, and MW-7 had detections and were qualified as estimated potential high bias (J+) for this analyte.

   - One or more LCS RECs for potassium in QC batch BBD3695 exceeded the QC limit. Samples MW-110, MW-112, MW-113, MW-114, MW-102, MW-104, MW-105R and MW-111 had detections and were qualified as estimated potential high bias (J+) for this analyte.

8. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the relative percent difference (RPD). They are also compared against the unspiked portion of the sample for REC of the spike. For one or more MS/MSDs, the lab could not calculate a REC and no result was reported. The corresponding LCS information was used to evaluate these analytes, and no qualifiers were added based on these omissions. Note, only site-specific samples were evaluated during the MS/MSD review. The following site-specific MS/MSD results were outside their respective control limits, and qualified as noted (see also Table 1 for all qualifications added).

- The MS/MSD REC performed on sample MW-1 (Lab ID-2030111) yielded RECs below the QC limit for lithium. The lithium detection in the noted parent sample was qualified as estimated potential low bias (J-).

  Also on this same spiked sample, the lab spike amounts were less than ¼ the respective concentrations in the parent sample for nickel, zinc, calcium, iron, magnesium, cobalt and sodium; hence, MS/MSD results were inconclusive.

- The MS/MSD REC performed on sample MW-6 (Lab ID-2030127) was below the QC limit for lithium. The lithium detection in the noted parent sample was qualified as estimated potential low bias (J-). Additionally, the lab spike was less than ¼ the concentration of the parent sample for the calcium, magnesium, and sodium. As such, the MS/MSD results were inconclusive for these analytes, and no data qualifiers were added.

- The MS/MSD REC performed on sample MW-113 (Lab ID- 2030120) exceeded QC limits for sulfate. The lab spike was less than ¼ the concentration of the parent sample, and MS/MSD results were inconclusive.

- The MS/MSD REC performed on sample Field blank (Lab ID- 2044990) exceeded QC limits for fluoride, chloride and sulfate. All of the above analytes were non-detect in the sample, and did not require qualification.

- The MS/MSD REC performed on sample Well duplicate (Lab ID- 2044130) was below QC limit for fluoride. Fluoride was non-detect in the parent sample and was qualified as estimated at reporting limit (UJ). The lab spike was less than ¼ the concentration of the parent sample for the chloride and sulfate, and the MS/MSD results were inconclusive for these analytes.

  Also on this same sample, the MS/MSD REC was below the QC limit for total alkalinity. Because the lab spike concentration was less than ¼ the concentration of parent sample, the MS/MSD results were inconclusive.

- The MS/MSD REC performed on sample MW-7 (Lab ID – 2030128) exceeded the QC limit for total alkalinity. Upon further review, it was determined the lab spike concentration was less than ¼ the concentration of the parent sample. Therefore, MS/MSD results were inconclusive.

- The MS/MSD REC performed on sample MW-4D (Lab ID – 2030125) was below the QC limit for COD. Because COD was detected in the noted parent sample, it was qualified as estimated potential low bias (J-).

- The MS/MSD REC performed on sample MW-105R (Lab ID – 2030115-01RE1) exceeded the QC limit for chloride and sulfate. Detections of chloride and sulfate in the parent sample was qualified as estimated potential high bias (J+).

- The MS/MSD RECs performed on sample MW-102 (Lab ID – 2030113) exceeded QC limit for iron. The iron detection in the parent sample was qualified as estimated potential high bias (J+). The lab spike amounts were less than ¼ the respective concentrations in the parent sample for calcium, magnesium, and sodium; hence MS/MSD results were inconclusive. The lab also reported a post spike on this same sample. The same ¼ rule applied here for calcium, potassium, and sodium. The post spike RECs for boron and iron exceeded the control limits. The noted spiked sample was qualified as estimated potential high bias (J+) for these analytes since no boron MS/MSD was reported and because the iron MS/MSD exceeded its control limits.

  Also, on the same spiked sample, the MS/MSD RECs exceeded the QC limit for potassium. Additionally, the lab reported a post spike for this sample, which also exceeded the QC limit. The potassium detection in the parent sample was qualified as estimated potential high bias (J+).

All other site-specific MS/MSD results were within QC limits.

9. Laboratory Duplicates – Laboratory duplicates were performed to evaluate analytical precision between samples when an MS/MSD may not be appropriate. Only project-specific laboratory duplicates were compared and used for qualification. All site-specific laboratory duplicates were within QC limits.

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

    - Is the compound detected in both portions?

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

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

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

The following field duplicate pair was included in this review, and detections are presented on Table 2:

- MW 5/ Well Duplicate (collected 04/27/2022): Sulfate did not meet the duplication criteria since it yielded an elevated RPD; as such, the parent/duplicate pair was qualified as estimated (J) for this analyte. Chloride was analyzed at different dilutions for the parent and duplicate samples, and therefore, no conclusion could be made on the duplicate discrepancy observed

11. Detection and Quantitation Limits – Dilutions were required to account for high concentrations of target analytes and/or matrix interferences in one or more samples. RLs were adjusted accordingly, and no data qualifiers were added based on these dilutions.

12. Method Requirements – In addition to the above QC items, the laboratory also noted other QC variances in the data. Although these are not part of the typical review, they are summarized below.

- Continuing Calibration Verification (CCV): Pace Madisonville flagged one or more thallium analytes as "V" to indicated that the associated CCV was outside its control limits. This is an upper level QC item, which is beyond the scope of this review. The CCV QC data were not included in these data sets for review. No data qualification for CCV results were added during this review.

13. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. Although several estimated qualifiers were added for various reasons, no data were rejected during this review. The data are valid for use, as qualified, in reporting the results of this investigation.

Attachments
Table 1 – Data Qualifier Table
Table 2 – Field Duplicate Comparison – Detections Only

Table 1
Data Qualifier Table
BREC Wilson - April 2022 Sampling Event
Ohio County, Kentucky

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason for Qualification
SW-846 6010 B	Boron	MW-102	203113-01	J+	Post spike REC > QC limit
SW846-6020 A	Copper	MW-2	2030122-01	JU	Lab blank detection in batch BBD 3692
		MW-4	2030124-01		
SW-846 6010 B	Iron	MW-102	203113-01	J+	Post spike REC > QC limit
SW846-6020 A	Lithium	MW-1	2030111-01	J-	MS/MSD REC < QC limit
		MW-6	2030127-01		
SW846 6010 B	Magnesium	MW-3	2030123-01	J-	One or more LCS REC < QC limit in batch BBD 3692
		MW-4	2030124-01		
		MW-4D	2030125-01		
		MW-5	2030126-01		
		MW-6	2030127-01		
		Well Duplicate	2030130-01		
		MW-8	2030129-01		
		MW-1	2030111-01		
		MW-10	2030112-01		
		MW-10D	2030116-01		
		MW-2	2030122-01		
		MW-7	2030128-01		
SW846-6020 A	Molybdenum	MW-114	2030121-01	JU	Field blank detection
SW846 6010 B	Potassium	MW-3	2030123-01	J+	One or more LCS RECs > QC limit in batch BBD 3692
		MW-4	2030124-01		
		MW-4D	2030125-01		
		MW-5	2030126-01		
		MW-8	2030129-01		
		Well Duplicate	2030130-01		
		MW-1	2030111-01		
		MW-10	2030112-01		
		MW-10D	2030116-01		
		MW-2	2030122-01		
		MW-7	2030128-01		
		MW-110	2030117-01	J+	One or more LCS RECs > QC limit in batch BBD 3695
		MW-112	2030119-01		
		MW-113	2030120-01		
		MW-114	2030121-01		
		MW-104	2030114-01		
		MW-105R	2030115-01		
		MW-111	2030118-01		
		MW-102	2030113-01	J+	One or more LCS RECs > QC limit in batch BBD 3695 MS/MSD RECs > QC limit Post Spike REC > QC limit
2540 C-2011	Total Dissolved Solids	MW-112	2030119-01	J-	Holding time excceedance

Table 1
Data Qualifier Table
BREC Wilson - April 2022 Sampling Event
Ohio County, Kentucky

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason for Qualification
SW846-6020 A	Zinc	MW-3	2030123-01	JU	Lab blank detection in batch BBD 3692
		MW-5	2030126-01		
		Well Duplicate	2030130-01		
		MW-10D	2030116-01		
		MW-2	2030122-01		
		MW-7	2030128-01		
	Radium 226 Radium 228 Total radium	MW-114	2030121-01	J	Field blank detection
	Radium 226 Radium 228 Total radium	MW-110	2030117-01	J	Method blank detection
		MW-105R	2030115-01		
		MW-111	2030118-01		
		MW-112	2030119-01		
		MW-113	2030120-01		
EPA 903.1 Total Radium by calculation	Radium 226 Total radium	MW-3	2030123-01	J	Method blank detection
		MW-4D	2030125-01		
		MW-5	2030126-01		
		Well Duplicate	2030130-01		
		MW-7	2030128-01		
EPA 904 Total Radium by calculation	Radium 228 Total radium	MW-102	2030113-01	J	Method blank detection
		MW-104	2030114-01		
		MW-10	2030112-01		
EPA 300.0 REV 2.1	Fluoride	Well Duplicate	2030130-01	UJ	MS/MSD REC < QC limit
HACH 8000	Chemical Oxygen Demand	MW-4D	2030125-01	J-	MS/MSD REC < QC limit
		MW-114	2030121-01	J+	Field blank detection
EPA 300.0 REV 2.1	Chloride	MW-105R	2030115-01	J+	MS/MSD REC > QC limit
EPA 300.0 REV 2.1	Sulfate	MW-105R	2030115-01	J+	MS/MSD REC > QC limit
		MW-5	2030126-01	J	Parent/duplicate failed RPD test
		Well Duplicate	2030130-01		

Notes:

J+ = Qualified as estimated potential high bias during data review
J- = Qualified as estimated potential low bias during data review
J = Qualified as estimated during data review
JU = Estimated trace concentration was qualified as non detect during data review
LCS = Laboratory Control Sample
MS/MSD = Matrix spike/Matrix spike duplicate
MW = Monitoring Well
REC = Percent Recovery
QC = Quality Assurance/Quality Control
UJ = Qualified as estimated at reporting limit during data review

Table 2
Field Duplicate Comparison - Detections Only
BREC Wilson - April 2022 Sampling Event
Ohio County, Kentucky

Sample ID:	MW-5		Well duplicate		Units	Meets QC
Lab ID:	2030126-01		2030130-01			
Date:	4/27/2022		4/27/2022			
Compound	Result	Qual	Result	Qual		
Arsenic	0.0026		0.0027		mg/L	Yes
Barium	0.011		0.011		mg/L	Yes
Boron	0.75		0.75		mg/L	Yes
Calcium	614		614		mg/L	Yes
Cobalt	0.007		0.008		mg/L	Yes
Iron	7.00		7.07		mg/L	Yes
Lithium	0.03		0.03		mg/L	Yes
Magnesium	255	J-	257	J-	mg/L	Yes
Molybdenum	0.003		0.004		mg/L	Yes
Nickel	0.005		0.005		mg/L	Yes
Potassium	10.9	J+	11.1	J+	mg/L	Yes
Sodium	95.2		94.7		mg/L	Yes
Zinc	0.009	JU	0.01	JU	mg/L	Yes
Bicarbonate Alkalinity as CaCO3	505		496		mg/L	Yes
Total Alkalinity	505		496		mg/L	Yes
Chemical Oxygen Demand	33		35		mg/L	Yes
Specific Conductance (Lab)	3830		3830		umhos/cm	Yes
Hardness as CaCO3	2370		2140		mg/L	Yes
Total Dissolved Solids	3480		3510		mg/L	Yes
Total Organic Carbon	2.1		2.2		mg/L	Yes
Chloride	221		347		mg/L	No - Dilution Difference
Sulfate	1710	J	1030	J	mg/L	No - RPD>QC
Total Radium	0.900 ± 0.826	J	1.79 ± 0.901	J	pCi/L	Yes

Notes:

CaCO3 - Calcium Carbonate
ID - identification
mg/L - milligrams per liter
J+ = Qualified as estimated potential high bias during data review
J- = Qualified as estimated potential low bias during data review
J = Qualified as estimated during data review
JU = Estimated trace concentration was qualified as non detect during data review
MW = Monitoring Well
pCi/L = picoCurie per liter
QC = Quality Assurance/Quality Control
UJ = Qualified as estimated at reporting limit during data review
umhos/cm = microsiemens per centimeter

Memorandum

Date: November 17, 2022

To: Christopher Hoglund

From: Omkar Parab

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data
BREC Wilson, Ohio County, Kentucky
Project No. 145762

Water samples were collected at the BREC Wilson Landfill Site in Ohio County, Kentucky between September 26 and September 30, 2022. The samples were analyzed by Pace Analytical Services of Madisonville, Kentucky (Pace Madisonville) or Pace Analytical of Greensburg, Pennsylvania (Pace Greensburg) for one or more of the following parameters:

Parameter	Analytical Method	Laboratory
Metals	SW846 6010 B SW846 6020 A	Pace - Madisonville
Mercury	EPA 245.7 REV	
Total Dissolved Solids (TDS)	2540 C-2011	
Anions chloride, fluoride, sulfate	EPA 300.0 REV 2.1	
Total Organic Carbon (TOC)	5310 C-2011	
Alkalinity Bicarbonate/carbonate alkalinity as CaCO3 Total alkalinity	 2320 B-2011 EPA 310.2	
Hardness as CaCO3	2340 C (as HACH 8226)	
Specific Conductance	2510 B-2011	
Chemical Oxygen Demand (COD)	HACH Method 8000	
Radium-226 Radium-228 *total calculated from radium-226 + radium-228 analyses.	EPA 903.1 EPA 904 Total Radium by calculation	Pace - Greensburg

Each sample location was reported in its own single data set with its associated QC results. Due to the overlap in sample dates for this event, several of the QC are associated with several samples across multiple data sets. To avoid redundancy, these are summarized by batching in this review. For the radium samples, Pace-Madisonville forwarded these to Pace-Greensburg.

The QA/QC results in association with the samples collected were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in United States Environmental Protection Agency's (USEPA's) *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI, 2020). The QA/QC review results are discussed below, and qualifiers added during this review are summarized on Table 1.

1. Chain-of-Custody (COC) – Several COCs sent from Pace Madisonville to Pace Greensburg for the radium analyses did not include signatures, times, and/or dates. The samples arrived and were

correctly logged-in and analyzed for radium as requested. Sample information was likely obtained from Pace's laboratory information management (LIM) system. Since only one sample location was provided per SDG, determination of sample location was not an issue. The relinquished and received signatures, times, and dates were present on the COCs for all samples sent from the field to Pace-Madisonville.

No custody seals were provided on sample coolers since samples were collected and delivered to Pace Madisonville by the field personnel. Sample coolers did not change possession; therefore, impact was minimal.

2. Requested Analyses Completed – All analyses were completed as requested with the following exception:

    - The radium sample volumes for MW7 were collected but inadvertently lost at the laboratory. Radium samples for this location were collected at a later date and data review for this data will be incorporated at a later date and/or by memo addendum.

3. Holding Times – Several radium samples were noted as lacking appropriate preservation of a pH less than 2 (pH<2). Upon arrival, Pace Greenburg added nitric acid (HNO_3). However, because this preservation was added more than 5 days after sample collection, the affected sample/result pairs were all qualified as estimated (J). This qualification was applied to all radium fractions for all samples except Field Blank and MW7 (which was inadvertently lost and not analyzed).

    The analysis for chloride for sample MW112 was performed outside its holding time. The lab flagged the result as 'H2' to indicate the exceedances and this result was qualified as potential low bias (J-).

    With the above exceptions, all samples/analyses were completed within their recommended holding time.

4. Sample Preservation – All samples were received by Pace-Madisonville slightly below the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C. Since the samples were not in a frozen state, the requested analyses were completed. The radium samples did not require thermal preservation.

5. Field Blank – Field blanks assess the potential for cross-contamination during the sample activities and/or transport. For this review, the field blank was associated with samples collected on 09/27/2022. The following field blank detections were noted during this review:

    - Lead, bicarbonate alkalinity as CaCO3, and specific conductance were detected in sample Field blank (Lab ID: 30526822001). While radium 228 and total radium detections were reported in this sample, radium 226 should still be reviewed for potential carryover when accounting for the uncertainty value associated with radium methods. Any low-level (J-flagged) detections of these analytes in associated samples MW4, MW4D, MW7, MW10,

and MW10D were qualified as non-detect (JU), while any detections greater than the reporting limit (RL) but less than five times the respective blank concentration were qualified as estimated potential high bias (J+). The exception is for radium, in which estimated (J) qualifiers were added due to the uncertainty associated with these analytes. The following summarizes the review of these analytes:

- Samples MW4, MW4D, MW7, MW10, and MW10D were non-detect for lead; therefore, no qualifiers were required.

- Samples MW4, MW4D, MW7, MW10, and MW10D yielded a bicarbonate alkalinity as CaCO3 detection greater than five times the field blank concentration; hence, no qualifier was required

- Samples MW4, MW4D, MW7, MW10, and MW10D yielded a specific conductivity detection greater than five times the field blank concentration; hence, no qualifier was required.

- Radium-226 and radium-228 (thus, total radium as well) were both considered detections in the field blank since there is uncertainty in their reported concentrations. Samples MW4, MW4D, MW10, and MW10D yielded radium-226, radium-228 and total radium detections over the RL but less than five times the field blank detections and were qualified as estimated (J).

Also, although not a field blank for sampling equipment, mercury field blanks were also submitted for each sample. No detections were noted in these blanks.

6. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses. The following method blank detections were noted during this review:

- Calcium was detected at a low level (J-flagged) in the laboratory blank for QC batch BBJ0011. As noted previously, this QC batch applied to several data sets, All samples exhibited detections greater than five times the method blank detection, and no qualification was required.

- Radium: Radium-226 and radium-228 were detected in all method blanks. Because of the uncertainty associated with radium results, the review criteria was slightly altered to account for this. For any associated radium-226 or radium-228 detection less than five times the corresponding method blank concentration plus its uncertainty, the respective result was qualified as estimated (J). Additionally, because this result was used in the calculation to report total radium, the total radium result for said sample was also qualified as estimated (J). Based on this, all samples were qualified estimated (J) for the radium fractions. Note, all samples were previously qualified estimated (J) for the preservation/holding time issues noted by the lab.

7. Laboratory Control Samples (LCS) – 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 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. In some instances, the lab also performed laboratory control sample duplicates.

    - All LCS Results were within QC limits.

8. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the relative percent difference (RPD). They are also compared against the unspiked portion of the sample for REC of the spike. For one or more MS/MSDs, the lab could not calculate a REC and no result was reported. The following site-specific MS/MSD results were outside their respective control limits, and qualified as noted (see also Table 1 for all qualifications added).

    - MS/MSD REC performed on sample MW5 (Lab ID 2093399-01):

        - The lab spike amounts for calcium, magnesium, sodium, and sulfate were less than ¼ the respective concentration of the parent sample. Therefore, the MS/MSD results for these metals were inconclusive. Additionally, MS/MSD results for boron were not reported. Review of the associated QC for boron was acceptable, and no further actions were necessary based on this omission.

        - The MS/MSD RECs of mercury were below the control limits. The parent sample was non-detect for analyte and qualified as estimated at the reporting limit (UJ).

        - Two MS results were reported for TOC, and both MS RECs exceeded the QC limits. TOC was detected in the parent sample and was qualified as estimated potential high bias (J+).

        - The MS/MSD RECs for chloride exceeded the control limits, while the MS/MSD RECs for fluoride were below the control limit, as well as below the NFGI 10 percent control limit. The chloride detection in the noted sample was qualified as estimated potential high bias (J+), while the non-detect fluoride result was rejected (UR).

- MS/MSD performed on sample MW1 (Lab ID 2093285-01):
    - The lab spike amounts for calcium, cobalt, iron, magnesium, nickel, sodium, and zinc were less than ¼ the respective concentration of the parent sample. As such, the MS/MSD results for these metals were inconclusive. Additionally, MS/MSD results for boron were not reported. Review of the associated QC for boron was acceptable, and no further actions were necessary based on this omission.
    - The MSD for potassium exceeded its QC limit. Because this analyte was detected in the parent sample, it was qualified as estimated potential high bias (J+).
    - The MS/MSD RECs for lithium exceeded the QC limit. This analyte was detected in the parent sample and was qualified as estimated potential high bias (J+).
    - The MS/MSD RECs were below the QC limit for selenium. Selenium was non-detect in the parent sample and was qualified as estimated at the reporting limit (UJ).
- MS/MSD performed on sample Well Duplicate 2 (Lab ID 2093405-01)
    - The MS REC for fluoride was below the control limit. Fluoride was non-detect in the parent sample and was qualified as estimated at the reporting limit (UJ). Because this was a field duplicate of MW105R (2093387), this sample was also qualified as noted above.
    - The MS/MSD REC sulfate was below the control limit. Sulfate was detected in the parent sample and was qualified as estimated potential low bias (J-).
- MS/MSD performed on sample MW104 (Lab ID 2093393-01)
    - The lab spike amounts for calcium, magnesium, and sodium were less than ¼ the respective concentration of the parent sample. Therefore, the MS/MSD results for these metals were inconclusive.
    - The MS/MSD RECs for antimony, barium, beryllium, cadmium, lead, lithium, and thallium were below the control limit. Barium and lithium were detected in the parent sample and were qualified as estimated potential low bias (J-). Antimony, beryllium, cadmium, lead, and thallium were non-detect in the parent sample and were qualified as estimated at the reporting limit (UJ).

- MS/MSD performed on sample MW111 (Lab ID 2093390-01)
    - The lab spike amount for sulfate was less than ¼ the respective concentration of the parent sample. Therefore, the MS/MSD result for sulfate was inconclusive.
    - The MS/MSD RECs for mercury were below the control limit. Mercury was non-detect in the parent sample and was qualified as estimated at the reporting limit (UJ).
    - The MS/MSD RECs for chloride and fluoride were below the control limit. chloride and fluoride were detected in the parent sample and were qualified as estimated potential low bias (J-).

All other site-specific MS/MSD results were within QC limits.

9. Laboratory Duplicates – Laboratory duplicates were performed to evaluate analytical precision between samples when an MS/MSD may not be appropriate. Only project-specific laboratory duplicates were compared and used for qualification. The following duplicate results were outside their respective control limits and qualified as noted (see also Table 1 for all qualifications added).

- Laboratory duplicate performed on MW5 (2093399-01):
    - One of the three COD laboratory duplicates performed on the noted sample yielded an elevated RPD that exceeded the QC limit. Upon further review, a sensitivity test was more practical since the results were less than five times the RL. Thus, no qualifiers were necessary.

All the other site-specific laboratory duplicates were within QC limits.

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

- Is the compound detected in both portions?
- If the sample concentrations are greater than 5 times the detection limit, then the maximum allowable RPD is 20 percent for water samples.
- If the sample concentrations are less than 5 times the detection limit, then a sensitivity test is applied. For the sensitivity test, the sample concentrations must agree within ± the lower detection limit for water samples.

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

The following field duplicate pairs were included in this review, and detections are presented on Table 2:

- ME-6/DUP /Well Duplicate 1(collected 09/26/2022): All field duplicate results were adequately replicated.

- MW-105R/ Well Duplicate 2 (collected 09/29/2022): Iron did not meet the duplication criteria since it yielded an elevated RPD. Also, TOC did not meet the duplication criteria since it failed the sensitivity test. As such, the parent/duplicate pair was qualified as estimated (J) for these analytes.

11. Detection and Quantitation Limits – Dilutions were required to account for high concentrations of target analytes and/or matrix interferences in one or more samples. RLs were adjusted accordingly, and no data qualifiers were added based on these dilutions.

12. Miscellaneous – Dilutions the laboratory also added various qualifiers based on upper-level review items. This included calibrations and post digestion spike (PDS) samples. The calibration information was not provided and was not included in this scope of review. No data qualifiers were added based solely on this calibration flags. For the PDS, the corresponding MS/MSDs were reviewed, and qualifiers were added, as applicable, based on these results. Several of the PDS results were also inconclusive as the spike amounts were less than ¼ the respective sample concentration. No qualifiers were added based on the PDS results.

13. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The fluoride result for MW5 was rejected during this review due to MS/MSD RECs below the lab and NFGI QC limits. With this exception, the data are valid for use, as qualified, in reporting the results of this investigation.

Attachments
Table 1 – Data Qualifier Table
Table 2 – Field Duplicate Comparison – Detections Only

Table 1
Data Qualifier Table
BREC Wilson - September 2022 Sampling Event
Ohio County, Kentucky

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW1	2093285	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
SW846 6010 B	Potassium			J+	MSD REC > QC limits
SW846-6020 A	Lithium			J+	MS/MSD RECs > QC limits
SW846-6020 A	Selenium			UJ	MS/MSD RECs < QC limit
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW2	2093395	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW3	2093396	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW4	2093397	J	Holding time exceedance/ Inadequate preservation in the field Method/Field blank detections
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW4D	2093398	J	Holding time exceedance/ Inadequate preservation in the field Method/Field blank detections
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW5	2093399	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
MS/MSD RECs < QC limits	Mercury			UJ	MS/MSD RECs < QC limits
5310 C-2011	Total Organic Carbon			J+	MS REC > QC limits
EPA 300.0 REV 2.1	Chloride			J+	MS/MSD RECs > QC limits
	Fluoride			UR	MS/MSD RECs < QC limit
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW6	2093400	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW8	2093403	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW10	2093383	J	Holding time exceedance/ Inadequate preservation in the field Method/Field blank detections
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW10D	2093388	J	Holding time exceedance/ Inadequate preservation in the field Method/Field blank detections
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW102	20933384	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW104	2093393	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
SW846-6020 A	Antimony			UJ	MS/MSD RECs < QC limit
	Thallium				
	Beryllium				
	Cadmium				
	Lead				
	Lithium			J-	
	Barium				

Table 1
Data Qualifier Table
BREC Wilson - September 2022 Sampling Event
Ohio County, Kentucky

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW105R	2093387	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
SW846 6010 B	Iron			J	Parent/ duplicate failed RPD test
EPA 300.0 REV 2.1	Fluoride			UJ	MS REC < QC limit
	Sulfate			J-	MS/MSD RECs < QC limits
5310 C-2011	Total Organic Carbon			J	Parent/ Duplicate failed sensitivity test
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW110	2093389	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW111	2093390	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 300.0 REV 2.1	Chloride			J-	MS/MSD RECs < QC limit
	Fluoride				
EPA 245.7 REV 2	Mercury			UJ	
EPA 300.0 REV 2.1	Chloride	MW112	2093391	J-	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium			J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW113	2093392	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW114	2093385	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	Well Duplicate 1 Duplicate of MW-6	2093404	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	Well Duplicate 2 Duplicate of MW105R	2093405	J	Holding time exceedance/ Inadequate preservation in the field Method blank detection
EPA 300.0 REV 2.1	Fluoride			UJ	MS REC < QC limit
	Sulfate			J-	MS/MSD RECs < QC limits
SW846 6010 B	Iron			J	Parent/ Duplicate Failed RPD test
5310 C-2011	Total Organic Carbon			J	Parent/ Duplicate Failed sensitivity test

Notes:

J = Qualified as estimated during data review
J- = Qualified as estimated potential low bias during data review
J+ = Qualified as estimated potential high bias during data review
LCS = Laboratory Control Sample
MS/MSD = Matrix spike/Matrix spike duplicate
MW = Monitoring Well
QC = Quality Assurance/Quality Control
REC = Percent Recovery
RPD = Relative Percent Difference
UJ = Nondetect result was qualified as estimated at the reporting limit during data review
UR = Nondetect result was rejected during this data review

Table 2
Field Duplicate Comparison - Detections Only
BREC Wilson - September 2022 Sampling Event
Ohio County, Kentucky

Sample ID: Lab ID: Date:	MW-6 2093400-01 9/26/2022	Well Duplicate 1 2093404-01 9/26/2022	Units	Meets QC
Arsenic	0.0049	0.0048	mg/L	Yes
Barium	0.012	0.013	mg/L	Yes
Boron	0.58	0.58	mg/L	Yes
Calcium	505	497	mg/L	Yes
Cobalt	0.008	0.008	mg/L	Yes
Iron	5.83	5.88	mg/L	Yes
Lithium	0.04	0.05	mg/L	Yes
Magnesium	242	238	mg/L	Yes
Molybdenum	0.007 J	0.007 J	mg/L	Yes
Nickel	0.015	0.015	mg/L	Yes
Potassium	8.25	8.29	mg/L	Yes
Sodium	36.9	38.1	mg/L	Yes
Bicarbonate Alkalinity as CaCO3	513	525	mg/L	Yes
Total Alkalinity	628	622	mg/L	Yes
Chemical Oxygen Demand	10	9	mg/L	Yes
Specific Conductance (Lab)	3070	3060	umhos/cm	Yes
Hardness as CaCO3	2130	1970	mg/L	Yes
Total Dissolved Solids	2920	2850	mg/L	Yes
Total Organic Carbon	1.9	1.6	mg/L	Yes
Chloride	24.4	25.3	mg/L	Yes
Sulfate	1710	1810	mg/L	Yes
Total Radium	0.842 J	0.829 J	pCi/L	Yes

Table 2
Field Duplicate Comparison - Detections Only
BREC Wilson - September 2022 Sampling Event
Ohio County, Kentucky

Sample ID: Lab ID: Date:	MW105R 2093387-01 9/29/2022	Well Duplicate 2 2093405-01 9/29/2022	Units	Meets QC
Arsenic	0.0011	0.0008 J	mg/L	Yes
Barium	0.032	0.033	mg/L	Yes
Calcium	204	171	mg/L	Yes
Copper	0.003 U	0.004	mg/L	Yes
Iron	1.69 J	1.21 J	mg/L	No - RPD>QC
Lead	0.002 U	0.0005 J	mg/L	Yes
Lithium	0.03	0.03	mg/L	Yes
Magnesium	58.8	56.4	mg/L	Yes
Molybdenum	0.002 J	0.002 J	mg/L	Yes
Nickel	0.023	0.028	mg/L	Yes
Potassium	1.85	2.21	mg/L	Yes
Sodium	39.6	38.4	mg/L	Yes
Bicarbonate Alkalinity as CaCO3	406	398	mg/L	Yes
Total Alkalinity	499	465	mg/L	Yes
Specific Conductance (Lab)	1300	1310.00	umhos/cm	Yes
Hardness as CaCO3	666	688	mg/L	Yes
Total Dissolved Solids	1010	1010	mg/L	Yes
Total Organic Carbon	0.8 J	1.6 J	mg/L	No - Sensitivity test failure
Chloride	11.5	11.7	mg/L	Yes
Sulfate	410 J-	418 J-	mg/L	Yes
Total Radium	1.35 J	3.3 J	pCi/L	Yes

Notes:

CaCO3 - Calcium Carbonate
ID - identification
mg/L - milligrams per liter
J = Qualified as estimated during data review
J- = Qualified as estimated potential low bias during data review
MW = Monitoring Well
pCi/L = picoCurie per liter
QC = Quality Assurance/Quality Control
U = Compound was not detected
umhos/cm = microsiemens per centimeter

Memorandum

Date: December 12, 2022

To: Christopher Hoglund

From: Shauna Lawrence

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data (Addendum)
BREC Wilson, Ohio County, Kentucky
Project No. 145762

One water sample (MW7) was collected at the BREC Wilson Landfill Site in Ohio County, Kentucky on November 1, 2022. This was a resample from the previous September sampling event, due to the loss of this sample during lab transit. The sample was analyzed by Pace Analytical of Greensburg, Pennsylvania (Pace Greensburg) for the following parameters:

Parameter	Analytical Method	Laboratory
Radium-226 Radium-228 *total calculated from radium-226 + radium-228 analyses.	EPA 903.1 EPA 904 Total Radium by calculation	Pace - Greensburg

The QA/QC results in association with the sample collected were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data as recommended in United States Environmental Protection Agency's (USEPA's) *National Functional Guidelines for Inorganic Superfund Methods Data Review* (NFGI, 2020). The QA/QC review results are discussed below, and qualifiers added during this review are summarized on Table 1.

1. Chain-of-Custody (COC) – The COC for the radium analyses did not include all signatures, times, and/or dates. The samples arrived and were correctly logged-in and analyzed for radium as requested. Sample information was likely obtained from Pace's laboratory information management (LIM) system. No custody seals were provided on sample coolers since samples were collected and delivered to Pace Madisonville by the field personnel (then sent to Pace Greensburg for the noted analyses). The samples did not change possession; therefore, impact was minimal.

2. Requested Analyses Completed – The noted analyses were completed as requested.

3. Holding Times – The lab noted the radium samples were lacking appropriate preservation of a pH less than 2 (pH<2). Upon arrival, Pace Greenburg added nitric acid (HNO_3). Because this preservation was added within 5 days after sample collection, no qualifiers were applied.

4. Sample Preservation – The radium samples did not require thermal preservation.

5. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses. The following method blank detections were noted during this review:

- Radium: Radium-226 and radium-228 were detected in their respective method blanks. Because of the uncertainty associated with radium results, the review criteria was slightly altered to account for this. For any associated radium-226 or radium-228 detection less than five times the corresponding method blank concentration plus its uncertainty, the respective result was qualified as estimated (J). Additionally, because this result was used in the calculation to report total radium, the total radium result for said sample was also qualified as estimated (J). Based on this, MW7 was qualified estimated (J) for the radium fractions.

6. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The radium data for MW7 are valid for use, as qualified, in reporting the results of this sampling event.

Attachment(s)
Table 1 – Data Qualifier Table (Addendum)

Table 1
Data Qualifier Table (Addendum)
BREC Wilson - November 2022 Sampling Event
Ohio County, Kentucky

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total radium	MW7	30535193	J	Method blank detection

Notes:

J = Qualified as estimated during data review

MW = Monitoring Well

APPENDIX F – STATISTICAL EVALUATION

November 1, 2022

Mr. Mike Mizell
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Re: Statistical Evaluation of April 2022 Assessment Monitoring Groundwater Data
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky
Agency Interest ID #: 3319
Activity I.D. #: AIN2014001

Dear Mr. Mizell:

This letter presents the results of the statistical evaluation of analytical data from the April 2022 assessment monitoring event performed at the D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky in accordance with the requirements of U.S. Environmental Protection Agency's *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (40 Code of Federal Regulations [CFR] Part 257, Subpart D)*. This letter also presents a comparison of the April 2022 sampling results to groundwater protection standards (GWPSs). The GWPSs for the groundwater monitoring network were reviewed and updated as part of the statistical evaluation completed for the April 2022 sampling event and are presented on Table 1. These GWPSs will continue to be reviewed and updated as additional data are collected. A comparison of the April 2022 data to the updated GWPSs is presented on Table 2. The statistical evaluation presented herein was performed in accordance with the *Update to Certification of Statistical Method for Evaluating Groundwater in accordance with 40 CFR* § *257.93 at D.B Wilson Station Phase II CC Landfill in Centertown, Kentucky* dated May 25, 2022.

In April 2022, the Phase II CCR Landfill Groundwater Monitoring Well Network was sampled for Appendix III and Appendix IV parameters per the requirements of 40 CFR §257.95(d)(1). Interwell prediction limit statistical analyses were performed for these well/constituent pairs and are discussed subsequently. GWPSs were also developed in accordance with 40 CFR §257.95(h) which describes a GWPS as the higher value between a determined background concentration for a site and the established maximum concentration limit (MCL) or the GWPS criteria for select Appendix IV parameters without an MCL presented in 40 CFR §257.95(h)(2). This letter presents the results of the statistical evaluation of the April 2022 assessment monitoring event for inclusion in the Phase II CCR Landfill Operating Record.

Statistical Evaluation of Phase II CCR Landfill Compliance Monitoring Well Network Evaluation

A summary of the interwell prediction limit evaluation was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in April 2022 CCR compliance monitoring wells at downgradient Monitoring Wells MW-5, MW-6, MW-7, and

MW-10 to calculated prediction limits (i.e., background limits) that were established using data collected from 2016 through April of 2022 from upgradient monitoring well MW-8. Certain parameters were detected in April 2022 at concentrations above the calculated background limits (equivalent to the MW-8 prediction limits), and a summary is included in Attachment 1. This included the following well/constituent pairs for downgradient compliance monitoring wells with statistically significant increases (SSIs) above calculated background limits:

Appendix III Parameters:

- Boron (MW-5, MW-6, MW-7, and MW-10)
- Calcium (MW-5, MW-6, MW-7, and MW-10)
- Chloride (MW-5, MW-6, MW-7, and MW-10)
- Total Dissolved Solids (TDS) (MW-5, MW-6, MW-7, and MW-10)

Appendix IV Parameters:

- Cobalt (MW-10)
- Lithium (MW-5, MW-6, and MW-7)

Results of exceedances of background were generally consistent with the 2019 through 2021 results. In 2021, the reported SSIs for sulfate (MW-5, MW-6, and MW-7), pH (MW-6 and MW-10), and cobalt (MW-5 and MW-6) were not identified as SSIs in April 2022. The Appendix IV SSIs for cobalt and/or lithium continue to occur at downgradient compliance monitoring wells.

The Appendix IV constituents with SSIs (cobalt and lithium) were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the GWPS by calculating the lower confidence limit (LCL) at 95% confidence for each well and constituent using all the Baseline, Detection, and Assessment monitoring results collected to date from each monitoring well. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS. The comparison of the calculated LCLs with the GWPSs for cobalt and lithium at downgradient compliance Monitoring Wells MW-5, MW-6, MW-7, and MW-10 resulted in the following well/constituent pairs with SSLs above the GWPS:

- Cobalt (MW-10)
- Lithium (MW-6)

The LCLs for the remaining well/constituent pairs for cobalt and lithium are less than the GWPS and thus are not considered SSLs. Attachment 1 provides a summary of the calculated LCLs in comparison with the GWPSs.

Results of SSLs above the GWPSs were generally consistent with the 2021 results. In 2021, the reported SSLs above GWPS for cobalt (MW-5 and MW-6) were not identified as SSLs above the GWPS in April 2022.

Given that certain Appendix III and IV constituents were observed within the Phase II CCR Landfill groundwater monitoring network at concentrations above their respective calculated background limit and/or the LCL for certain Appendix IV constituents was greater than the corresponding GWPSs, these results do not warrant a transition to detection monitoring per the requirements of 40 CFR §257.95(f) and assessment monitoring will continue for the next second half semiannual monitoring event in 2022.

Sincerely,

Burns & McDonnell Engineering Company, Inc.



Chris Hoglund, PG
Project Manager

Attachments:

Table 1 – Summary of Groundwater Protection Standards
Table 2 – Summary of April 2022 Analytical Results
Attachment 1 – Sanitas™ Statistical Outputs for Phase II CCR Landfill Compliance Monitoring Network

cc: Greg Dick, BREC Wilson Station
Diana Merritt, BREC Wilson Station

TABLES

Table 1
Calculated Background and Groundwater Protection Standards for Groundwater
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

Detection Constituents (Appendix III)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Boron	mg/L	0.0518	-	-	-
Calcium	mg/L	349	-	-	-
pH (field)	SU	4.91 - 6.84	-	-	-
TDS	mg/L	1782	-	-	-
Chloride	mg/L	5.666	-	-	-
Fluoride	mg/L	0.4772	-	-	-
Sulfate	mg/L	2180	-	-	-
Assessment Constituents (Appendix IV)	**Units**	**Background***	**MCL**	**40 CFR §257.95(h)(2) Criteria**	**Groundwater Protection Standard**
Antimony	mg/L	0.001	0.006	-	0.006
Arsenic	mg/L	0.0144	0.01	-	0.0144
Barium	mg/L	0.07	2	-	2
Beryllium	mg/L	0.001	0.004	-	0.004
Cadmium	mg/L	0.0004	0.005	-	0.005
Chromium	mg/L	0.0224	0.1	-	0.1
Cobalt	mg/L	0.009	--	0.006	0.009
Fluoride	mg/L	0.4772	4	-	4
Lead	mg/L	0.012	--	0.015	0.015
Lithium	mg/L	0.0247	-	0.04	0.04
Mercury	mg/L	0.0002	0.002	-	0.002
Molybdenum	mg/L	0.0187	-	0.1	0.1
Combined Radium 226 and 228**	pCi/L	2.94	5	-	5
Selenium	mg/L	0.000501	0.05	-	0.05
Thallium	mg/L	0.0002	0.002	-	0.002

Notes:

*Background concentrations were determined utilizing interwell prediction limits (Attachment 1). Upgradient Monitoring Well MW-8 were used to calculate background concentrations. This included background data ranging from April 2016 through April 2022

**Combined radium is reported with an associate range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

mg/L - milligrams per Liter

pCi/L - picocuries per Liter

MCL - Maximum Contaminant Level

SU - standard units

Table 2
Summary of April 2022 Groundwater Results
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

		Sample Location:			MW-5	MW-6	MW-7	MW-8	MW-10	MW-4D	MW-10D
		Sample Date:	Calculated Background[1]	GWPS[2]	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/27/2022	4/27/2022
		Laboratory ID(s):			2030126-1 2030130-01	2030127-01	2030128-01	2030129-01	2030112-01	2030125-01	2030116-01
		All analytes excl. Radium/Radium only									
		Note(s):			Field Duplicate[3]			Background Well			
Analytical Method	**Analyte**	**Unit**			**CCR Compliance Monitoring Well Network**					**Characterization Monitoring Wells**	
Appendix III - Detection Monitoring											
6010B	Boron	mg/l	0.0518	--	**0.75**	**0.52 M2**	**3.05 D1**	<0.10 U	**0.43**	**10.3 D1**	**3.16 D2**
6010B	Calcium	mg/l	349	--	**614 D1**	**484 D1, M2**	**420 D1**	239 D1	**391 D1**	**678 D1**	**482 D1**
300.0 REV 2.1	Chloride	mg/l	5.666	--	**347**	**16.5**	**120 D**	3.7	**57.9**	**1110 D**	**145 D**
300.0 REV 2.1	Fluoride	mg/l	0.4772	4	<0.20 U	<0.20 U	0.22	0.25	<0.20 U	<0.20 U	0.41
300.0 REV 2.1	Sulfate	mg/l	2180	--	1710 D,J	1470 D	1950 D	1330 D	1420 D	**2260**	1150 D
In Situ	pH (Field Measurement)	su	4.91 - 6.84	--	6.20	6.44	6.47	6.28	6.25	**7.34**	**7.11**
2340 C-2011	Total Dissolved Solids	mg/l	1782	--	**3510**	**2790**	**2310**	1470	**3160**	**4210**	1070
Detected Appendix IV - Assessment Monitoring[3]											
6020A	Antimony	mg/l	0.001	0.006	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U
6020A	Arsenic	mg/l	0.0144	0.0144	0.0027	0.0046	0.0040	0.0102	0.0009 J	0.003	0.0029
6020A	Barium	mg/l	0.07	2	0.011	0.011	0.013	0.050	0.004	0.015	0.016
6020A	Beryllium	mg/l	0.001	0.004	<0.0020 U	<0.0020 U	<0.0020 U	0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U
6020A	Cadmium	mg/l	0.0004	0.005	<0.0010 U	<0.0010 U	<0.0010	0.0003 J	0.0001 J	<0.0010 U	<0.0010 U
6020A	Chromium	mg/l	0.0224	0.1	<0.0020 U	<0.0020 U	0.0006 J	0.0155	0.0008 J	0.0013 J	<0.0020 U
6020A	Cobalt	mg/l	0.009	0.009	0.008	0.008	<0.004 U	0.009	**0.022**	0.009	0.005
300.0 REV 2.1	Fluoride	mg/l	0.4772	4	<0.20 U	<0.20 U	0.22	0.25	<0.20 U	<0.20 U	0.41
6020A	Lead	mg/l	0.012	0.015	<0.002 U	<0.002 U	<0.002 U	0.007	<0.002 U	<0.002 U	<0.002 U
6020A	Lithium	mg/l	0.0247	0.04	**0.03**	**0.04 J-**	**0.19**	0.02	0.006 J	**0.18**	**0.07**
6020A	Mercury	mg/l	0.0002	0.002	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U
6020A	Molybdenum	mg/l	0.0187	0.1	0.004 J	0.006 J	0.006 J	0.01	<0.01 U	0.007 J	0.009 J
903.1/904.0	Combined Radium 226 and 228[4]	pCi/l	2.94	5	1.79 J	1.49	0.605 J	1.52	0.924 J	1.07 J	1.63
6020A	Selenium	mg/l	0.000501	0.05	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	**0.001 J**	<0.003 U
6020A	Thallium	mg/l	0.0002	0.002	<0.0020 U	<0.0020 U	<0.0020 U	0.0001 J	<0.0020 U	<0.0020 U	<0.0020 U

Notes

1 - Background concentrations were determined utilizing interwell prediction limits. Upgradient well MW-8 was used to determine these background concentrations. This included data ranging from April 2016 through April 2022.

2 - GWPSs were developed in accordance with §257.95(h).

3 - The highest concentration is reported between MW-5 and associated field duplicate sample.

4 - Combined radium is reported with an associate range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

Bold - Analyte detected above calculated background concentration.

Parameters were detected in wells located downgradient of the CCR Landfill at a concentration greater than the GWPS.

CCR - coal combustion residuals

D - Results reported from dilution

D1 - Sample required dilution due to high concentration of target analyte

GWPS - Groundwater Protection Standard

H2 - Initial analysis within holding time. Reanalysis was past holding time.

J (+/-) -estimated concentration (bias indicator [high + / low -])

JU - = Estimated trace concentration was qualified as non detect during data review

M1 - Matrix spike recovery was high; the method control sample recovery was acceptable.

M2 - Matrix spike recovery was low; the method control sample recovery was acceptable.

mg/l - milligram per liter

pCi/L - picocurie per liter

su - standard unit

U - Non Detect at the identified concentration

V1 - CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

Table 2
Summary of April 2022 Groundwater Results
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

Sample Location: / Sample Date: / Laboratory ID(s): / All analytes excl. Radium/Radium only / Note(s):			Calculated Background[1]	GWPS[2]	MW-102 4/28/2022 203113-01	MW-104 4/28/2022 2030114-01	MW-105R 4/28/2022 2030115-01	MW-110 4/28/2022 2030117-01	MW-111 4/28/2022 2030118-01	MW-112 4/28/2022 2030119-01	MW-113 4/28/2022 2030120-01	MW-114 4/28/2022 2030121-01
Analytical Method	**Analyte**	**Unit**			**Characterization Monitoring Wells**							
Appendix III - Detection Monitoring												
6010B	Boron	mg/l	0.0518	--	<0.10 M1,M2,J+	<0.10 U	<0.10 U	<0.10 U	**0.23**	**0.15**	<0.10 U	<0.10 U
6010B	Calcium	mg/l	349	--	88.4 M1,D1	312 D1	214 D1	40.7 D1	**627 D1**	250 D1	206 D1	115 D1
300.0 REV 2.1	Chloride	mg/l	5.666	--	**34.2**	**12.2**	**12.2 J+**	**11.4**	3.8	**51.7**	**35.0**	**40.0**
300.0 REV 2.1	Fluoride	mg/l	0.4772	4	0.29	<0.20 U	<0.20 U	0.23	<0.20 U	<0.20 U	0.22	0.22
300.0 REV 2.1	Sulfate	mg/l	2180	--	245 D	630 U	439 D,M1,J+	94.6 D	1800 D,H2	512 D1	557 D,M1	138 D1
In Situ	pH (Field Measurement)	su	4.91 - 6.84	--	6.59	6.24	6.38	6.19	6.43	6.35	6.17	6.69
2340 C-2011	Total Dissolved Solids	mg/l	1782	--	792	1550	**1800**	**2590**	304	1040 J-, H2	1200	1510
Detected Appendix IV - Assessment Monitoring[3]												
6020A	Antimony	mg/l	0.001	0.006	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	**0.002 J**	<0.005 U
6020A	Arsenic	mg/l	0.0144	0.0144	0.0042	0.0004 J	0.0016	0.0029	0.0027	0.0013	0.0116	0.0025
6020A	Barium	mg/l	0.07	2	0.047	0.031	0.033	0.057	0.021	0.028	0.053	0.067
6020A	Beryllium	mg/l	0.001	0.004	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U
6020A	Cadmium	mg/l	0.0004	0.005	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U
6020A	Chromium	mg/l	0.0224	0.1	<0.002 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U
6020A	Cobalt	mg/l	0.009	0.009	<0.004 U	<0.004 U	<0.004 U	<0.004 U	**0.011**	0.004	**0.037**	<0.004 U
300.0 REV 2.1	Fluoride	mg/l	0.4772	4	0.29	<0.20 U	<0.20 U	0.23	<0.20 U	<0.20 U	0.22	0.22
6020A	Lead	mg/l	0.012	0.015	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U
6020A	Lithium	mg/l	0.0247	0.04	<0.02 U	0.02	**0.03**	<0.02 U	**0.04**	0.01 J	**0.04**	0.02
6020A	Mercury	mg/l	0.0002	0.002	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U
6020A	Molybdenum	mg/l	0.0187	0.1	<0.01 U	<0.01 U	0.005 J	<0.01 U	0.003 J	0.002 J	**0.02**	0.007 JU
903.1/904.0	Combined Radium 226 and 228[4]	pCi/l	2.94	5	1.14 J	1.32 J	1.86 J	0.594 J	1.51 J	0.173 J	0.976 J	1.86 J
6020A	Selenium	mg/l	0.000501	0.05	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U
6020A	Thallium	mg/l	0.0002	0.002	<0.0020 V1,U	<0.0020 U	0.0001 V1,J	<0.002 V1,U	0.0001 V1,U	<0.0020 V1,U	<0.02 V1,U	<0.002 V1,U

Notes

1 - Background concentrations were determined utilizing interwell prediction limits. Upgradient well MW-8 wa

2 - GWPSs were developed in accordance with §257.95(h).

3 - The highest concentration is reported between MW-5 and associated field duplicate sample.

4 - Combined radium is reported with an associate range. However, this range cannot be incorporated into s these results, the reported laboratory concentration was used for the statistical analyses.

Bold - Analyte detected above calculated background concentration.

Parameters were detected in wells located downgradient of the CCR Landfill at a concentration greater than t

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M1 - Matrix spike recovery was high; the method control sample recovery was acceptable.

M2 - Matrix spike recovery was low; the method control sample recovery was acceptable.

mg/l - milligram per liter

pCi/L - picocurie per liter

su - standard unit

U - Non Detect at the identified concentration

V1 - CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS FOR PHASE II CCR LANFILL COMPLIANCE MONITORING WELL NETWORK

CCR Wells Interwell Prediction Limit

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 10/19/2022, 9:49 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-5	0.001	n/a	4/27/2022	0.001ND	No	17	58.82	n/a	0.05146	NP Inter (NDs)
Antimony (mg/L)	MW-6	0.001	n/a	4/27/2022	0.001ND	No	17	58.82	n/a	0.05146	NP Inter (NDs)
Antimony (mg/L)	MW-7	0.001	n/a	4/27/2022	0.001ND	No	17	58.82	n/a	0.05146	NP Inter (NDs)
Antimony (mg/L)	MW-10	0.001	n/a	4/27/2022	0.001ND	No	17	58.82	n/a	0.05146	NP Inter (NDs)
Arsenic (ug/L)	MW-5	14.4	n/a	4/27/2022	2.6	No	18	0	n/a	0.04893	NP Inter (normality)
Arsenic (ug/L)	MW-6	14.4	n/a	4/27/2022	4.6	No	18	0	n/a	0.04893	NP Inter (normality)
Arsenic (ug/L)	MW-7	14.4	n/a	4/27/2022	4	No	18	0	n/a	0.04893	NP Inter (normality)
Arsenic (ug/L)	MW-10	14.4	n/a	4/27/2022	0.9	No	18	0	n/a	0.04893	NP Inter (normality)
Barium (ug/L)	MW-5	70	n/a	4/27/2022	11	No	17	0	n/a	0.05146	NP Inter (normality)
Barium (ug/L)	MW-6	70	n/a	4/27/2022	11	No	17	0	n/a	0.05146	NP Inter (normality)
Barium (ug/L)	MW-7	70	n/a	4/27/2022	13	No	17	0	n/a	0.05146	NP Inter (normality)
Barium (ug/L)	MW-10	70	n/a	4/27/2022	4	No	17	0	n/a	0.05146	NP Inter (normality)
Beryllium (ug/L)	MW-5	1	n/a	4/27/2022	0.5ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Beryllium (ug/L)	MW-6	1	n/a	4/27/2022	0.5ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Beryllium (ug/L)	MW-7	1	n/a	4/27/2022	0.5ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Beryllium (ug/L)	MW-10	1	n/a	4/27/2022	0.5ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Boron (ug/L)	**MW-5**	**51.8**	**n/a**	**4/27/2022**	**750**	**Yes**	**18**	**38.89**	**n/a**	**0.04893**	**NP Inter (normality)**
Boron (ug/L)	**MW-6**	**51.8**	**n/a**	**4/27/2022**	**520**	**Yes**	**18**	**38.89**	**n/a**	**0.04893**	**NP Inter (normality)**
Boron (ug/L)	**MW-7**	**51.8**	**n/a**	**4/27/2022**	**3050**	**Yes**	**18**	**38.89**	**n/a**	**0.04893**	**NP Inter (normality)**
Boron (ug/L)	**MW-10**	**51.8**	**n/a**	**4/27/2022**	**430**	**Yes**	**18**	**38.89**	**n/a**	**0.04893**	**NP Inter (normality)**
Cadmium (ug/L)	MW-5	0.4	n/a	4/27/2022	0.05ND	No	16	87.5	n/a	0.05426	NP Inter (NDs)
Cadmium (ug/L)	MW-6	0.4	n/a	4/27/2022	0.05ND	No	16	87.5	n/a	0.05426	NP Inter (NDs)
Cadmium (ug/L)	MW-7	0.4	n/a	4/27/2022	0.05ND	No	16	87.5	n/a	0.05426	NP Inter (NDs)
Cadmium (ug/L)	MW-10	0.4	n/a	4/27/2022	0.1	No	16	87.5	n/a	0.05426	NP Inter (NDs)
Calcium (ug/L)	**MW-5**	**349000**	**n/a**	**4/27/2022**	**614000**	**Yes**	**18**	**0**	**n/a**	**0.04893**	**NP Inter (normality)**
Calcium (ug/L)	**MW-6**	**349000**	**n/a**	**4/27/2022**	**484000**	**Yes**	**18**	**0**	**n/a**	**0.04893**	**NP Inter (normality)**
Calcium (ug/L)	**MW-7**	**349000**	**n/a**	**4/27/2022**	**420000**	**Yes**	**18**	**0**	**n/a**	**0.04893**	**NP Inter (normality)**
Calcium (ug/L)	**MW-10**	**349000**	**n/a**	**4/27/2022**	**391000**	**Yes**	**18**	**0**	**n/a**	**0.04893**	**NP Inter (normality)**
Chloride (mg/L)	**MW-5**	**5.666**	**n/a**	**4/27/2022**	**221**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-6**	**5.666**	**n/a**	**4/27/2022**	**16.5**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-7**	**5.666**	**n/a**	**4/27/2022**	**120**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-10**	**5.666**	**n/a**	**4/27/2022**	**57.9**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Chromium (ug/L)	MW-5	22.4	n/a	4/27/2022	0.3ND	No	17	41.18	n/a	0.05146	NP Inter (normality)
Chromium (ug/L)	MW-6	22.4	n/a	4/27/2022	0.3ND	No	17	41.18	n/a	0.05146	NP Inter (normality)
Chromium (ug/L)	MW-7	22.4	n/a	4/27/2022	0.6	No	17	41.18	n/a	0.05146	NP Inter (normality)
Chromium (ug/L)	MW-10	22.4	n/a	4/27/2022	0.8	No	17	41.18	n/a	0.05146	NP Inter (normality)
Cobalt (ug/L)	MW-5	9	n/a	4/27/2022	7	No	17	35.29	n/a	0.05146	NP Inter (normality)
Cobalt (ug/L)	MW-6	9	n/a	4/27/2022	8	No	17	35.29	n/a	0.05146	NP Inter (normality)
Cobalt (ug/L)	MW-7	9	n/a	4/27/2022	2ND	No	17	35.29	n/a	0.05146	NP Inter (normality)
Cobalt (ug/L)	**MW-10**	**9**	**n/a**	**4/27/2022**	**22**	**Yes**	**17**	**35.29**	**n/a**	**0.05146**	**NP Inter (normality)**
Fluoride (mg/L)	MW-5	0.4772	n/a	4/27/2022	0.09ND	No	18	0	ln(x)	0.01	Param Inter
Fluoride (mg/L)	MW-6	0.4772	n/a	4/27/2022	0.09ND	No	18	0	ln(x)	0.01	Param Inter
Fluoride (mg/L)	MW-7	0.4772	n/a	4/27/2022	0.22	No	18	0	ln(x)	0.01	Param Inter
Fluoride (mg/L)	MW-10	0.4772	n/a	4/27/2022	0.09ND	No	18	0	ln(x)	0.01	Param Inter
Lead (ug/L)	MW-5	12	n/a	4/27/2022	0.25ND	No	17	70.59	n/a	0.05146	NP Inter (NDs)
Lead (ug/L)	MW-6	12	n/a	4/27/2022	0.25ND	No	17	70.59	n/a	0.05146	NP Inter (NDs)
Lead (ug/L)	MW-7	12	n/a	4/27/2022	0.25ND	No	17	70.59	n/a	0.05146	NP Inter (NDs)
Lead (ug/L)	MW-10	12	n/a	4/27/2022	0.25ND	No	17	70.59	n/a	0.05146	NP Inter (NDs)
Lithium (ug/L)	**MW-5**	**24.7**	**n/a**	**4/27/2022**	**30**	**Yes**	**18**	**22.22**	**No**	**0.01**	**Param Inter**
Lithium (ug/L)	**MW-6**	**24.7**	**n/a**	**4/27/2022**	**40**	**Yes**	**18**	**22.22**	**No**	**0.01**	**Param Inter**

CCR Wells Interwell Prediction Limit

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 10/19/2022, 9:49 AM

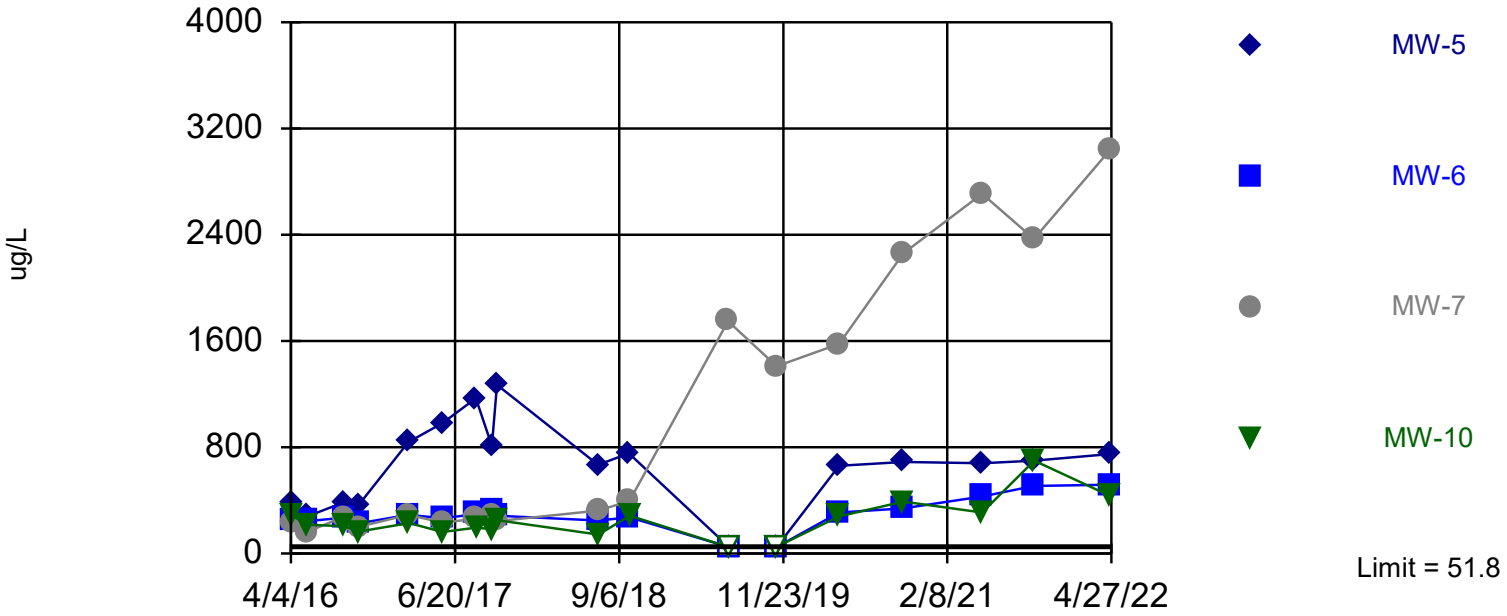
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Lithium (ug/L)	**MW-7**	**24.7**	**n/a**	**4/27/2022**	**190**	**Yes**	**18**	**22.22**	**No**	**0.01**	**Param Inter**
Lithium (ug/L)	MW-10	24.7	n/a	4/27/2022	6	No	18	22.22	No	0.01	Param Inter
Mercury (ug/L)	MW-5	0.2	n/a	4/27/2022	0.1ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	4/27/2022	0.1ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Mercury (ug/L)	MW-7	0.2	n/a	4/27/2022	0.1ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Mercury (ug/L)	MW-10	0.2	n/a	4/27/2022	0.1ND	No	16	100	n/a	0.05426	NP Inter (NDs)
Molybdenum (ug/L)	MW-5	18.7	n/a	4/27/2022	3	No	18	0	n/a	0.04893	NP Inter (normality)
Molybdenum (ug/L)	MW-6	18.7	n/a	4/27/2022	6	No	18	0	n/a	0.04893	NP Inter (normality)
Molybdenum (ug/L)	MW-7	18.7	n/a	4/27/2022	6	No	18	0	n/a	0.04893	NP Inter (normality)
Molybdenum (ug/L)	MW-10	18.7	n/a	4/27/2022	1ND	No	18	0	n/a	0.04893	NP Inter (normality)
pH [Field] (SU)	MW-5	6.84	4.91	4/27/2022	6.2	No	19	0	n/a	0.09328	NP Inter (normality)
pH [Field] (SU)	MW-6	6.84	4.91	4/27/2022	6.44	No	19	0	n/a	0.09328	NP Inter (normality)
pH [Field] (SU)	MW-7	6.84	4.91	4/27/2022	6.47	No	19	0	n/a	0.09328	NP Inter (normality)
pH [Field] (SU)	MW-10	6.84	4.91	4/27/2022	6.25	No	19	0	n/a	0.09328	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-5	2.94	n/a	4/27/2022	0.9	No	17	0	n/a	0.05146	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-6	2.94	n/a	4/27/2022	1.49	No	17	0	n/a	0.05146	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-7	2.94	n/a	4/27/2022	0.605	No	17	0	n/a	0.05146	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-10	2.94	n/a	4/27/2022	0.924	No	17	0	n/a	0.05146	NP Inter (normality)
Selenium (ug/L)	MW-5	0.501	n/a	4/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Selenium (ug/L)	MW-6	0.501	n/a	4/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Selenium (ug/L)	MW-7	0.501	n/a	4/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Selenium (ug/L)	MW-10	0.501	n/a	4/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Sulfate (mg/L)	MW-5	2180	n/a	4/27/2022	1710	No	18	0	n/a	0.04893	NP Inter (normality)
Sulfate (mg/L)	MW-6	2180	n/a	4/27/2022	1470	No	18	0	n/a	0.04893	NP Inter (normality)
Sulfate (mg/L)	MW-7	2180	n/a	4/27/2022	1950	No	18	0	n/a	0.04893	NP Inter (normality)
Sulfate (mg/L)	MW-10	2180	n/a	4/27/2022	1420	No	18	0	n/a	0.04893	NP Inter (normality)
Thallium (ug/L)	MW-5	0.2	n/a	4/27/2022	0.05ND	No	17	82.35	n/a	0.05146	NP Inter (NDs)
Thallium (ug/L)	MW-6	0.2	n/a	4/27/2022	0.05ND	No	17	82.35	n/a	0.05146	NP Inter (NDs)
Thallium (ug/L)	MW-7	0.2	n/a	4/27/2022	0.05ND	No	17	82.35	n/a	0.05146	NP Inter (NDs)
Thallium (ug/L)	MW-10	0.2	n/a	4/27/2022	0.05ND	No	17	82.35	n/a	0.05146	NP Inter (NDs)
Total Dissolved Solids (mg/L)	**MW-5**	**1782**	**n/a**	**4/27/2022**	**3480**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-6**	**1782**	**n/a**	**4/27/2022**	**2790**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-7**	**1782**	**n/a**	**4/27/2022**	**2310**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-10**	**1782**	**n/a**	**4/27/2022**	**3160**	**Yes**	**18**	**0**	**No**	**0.01**	**Param Inter**

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Hollow symbols indicate censored values.

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. 38.89% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

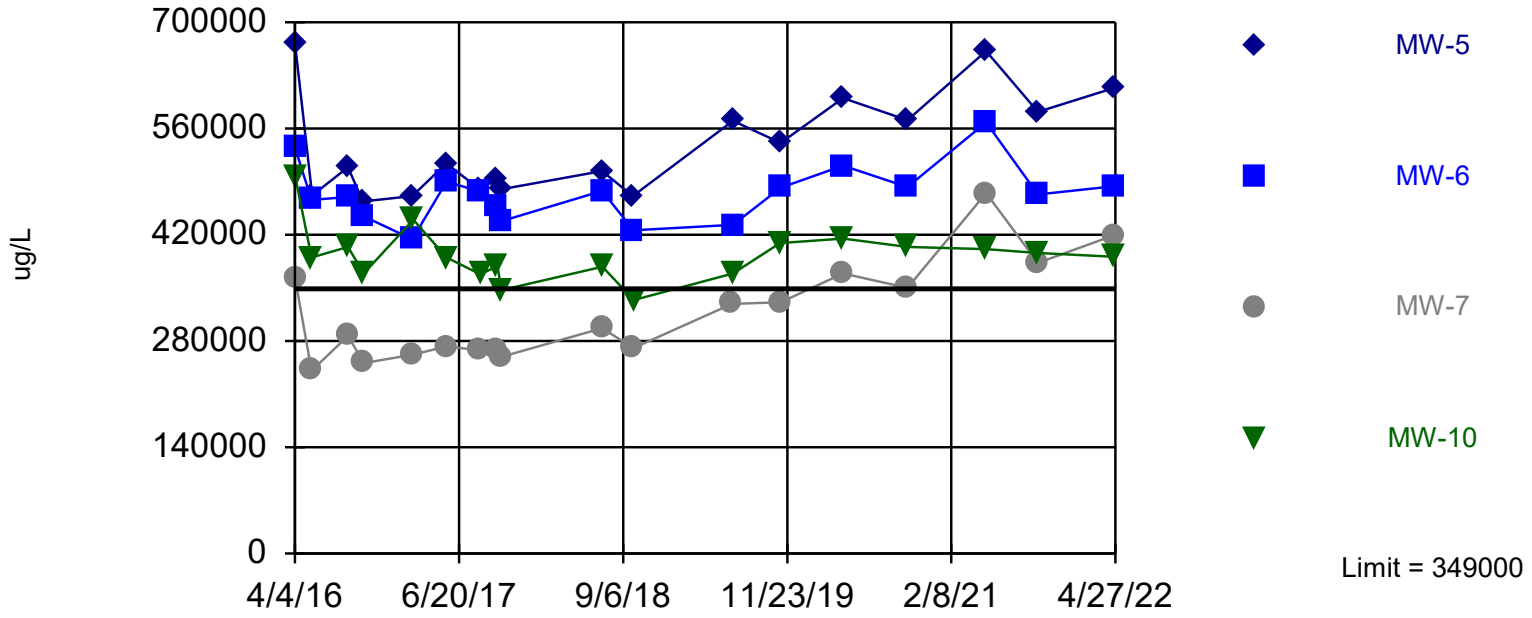
Constituent: Boron Analysis Run 10/21/2022 8:04 AM View: Original Wells

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. Report alpha = 0.1818. Individual comparison alpha = 0.04893. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Calcium Analysis Run 10/21/2022 8:04 AM View: Original Wells

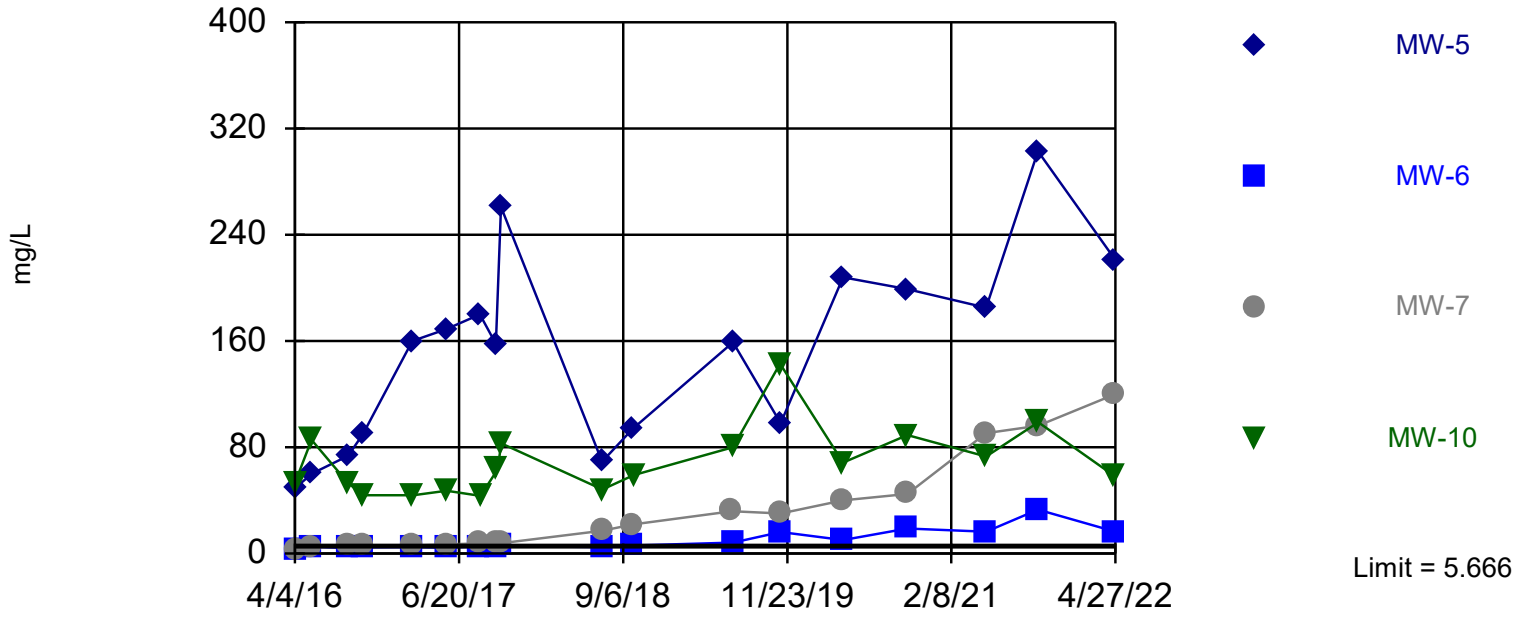
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.313, Std. Dev.=0.5132, n=18. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9352, critical = 0.897. Report alpha = 0.0394. Individual comparison alpha = 0.01. 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 10/21/2022 8:04 AM View: Original Wells

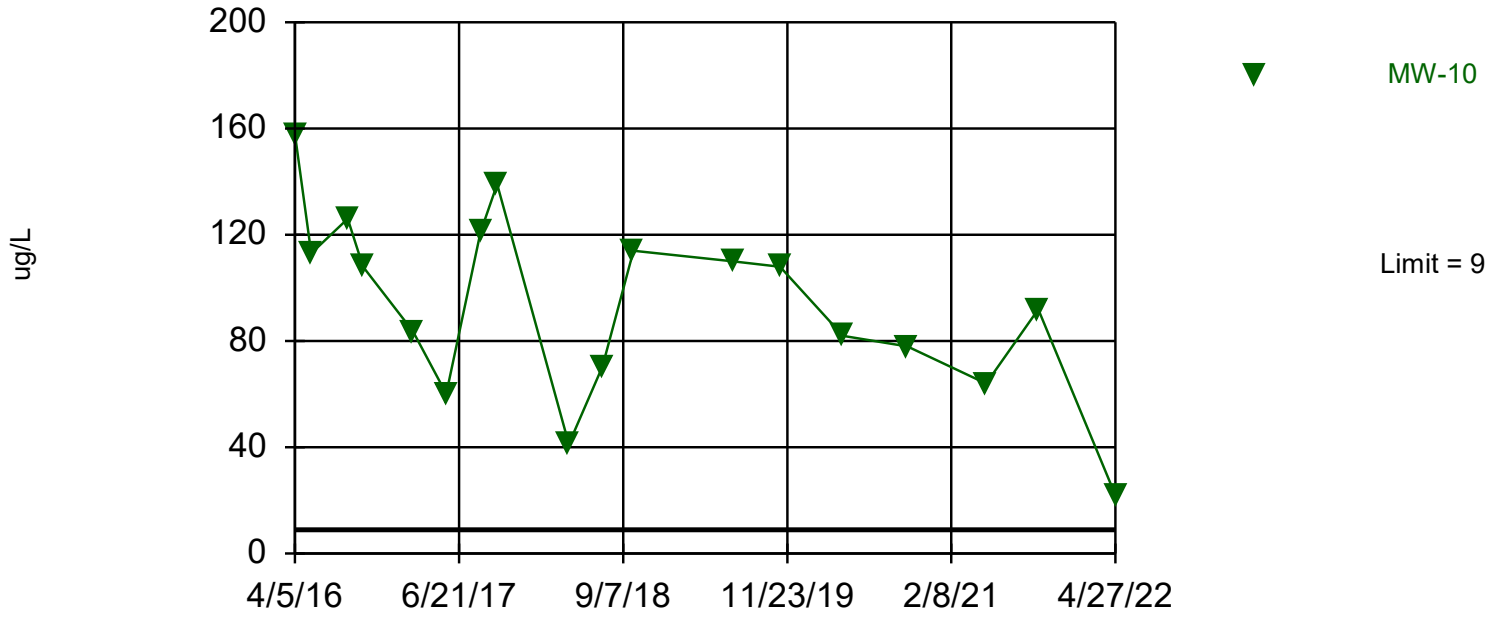
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 17 background values. 35.29% NDs. Report alpha = 0.05556. Most recent point compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Cobalt Analysis Run 10/21/2022 8:09 AM View: Original Wells

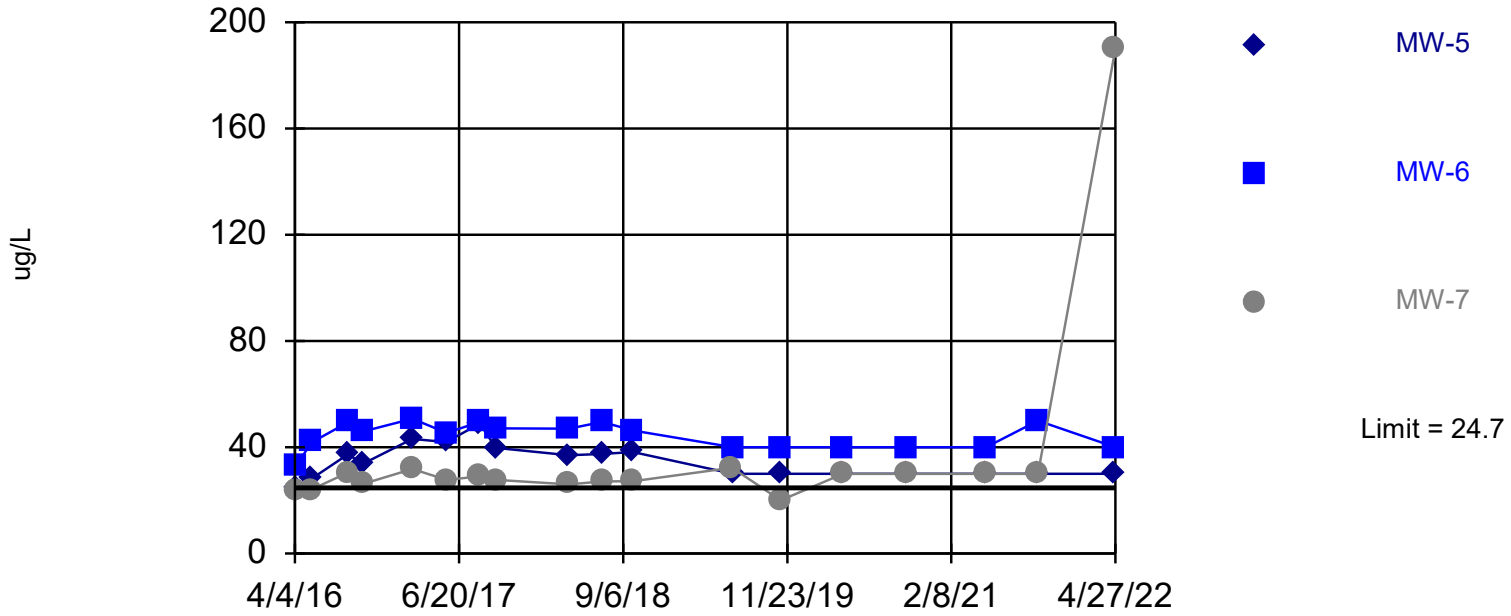
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7

Prediction Limit

Interwell Parametric



Background Data Summary (after Cohen`s Adjustment): Mean=9.995, Std. Dev.=5.577, n=18, 22.22% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9176, critical = 0.897. Report alpha = 0.0297. Individual comparison alpha = 0.01. 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: Lithium Analysis Run 10/21/2022 8:15 AM View: Original Wells

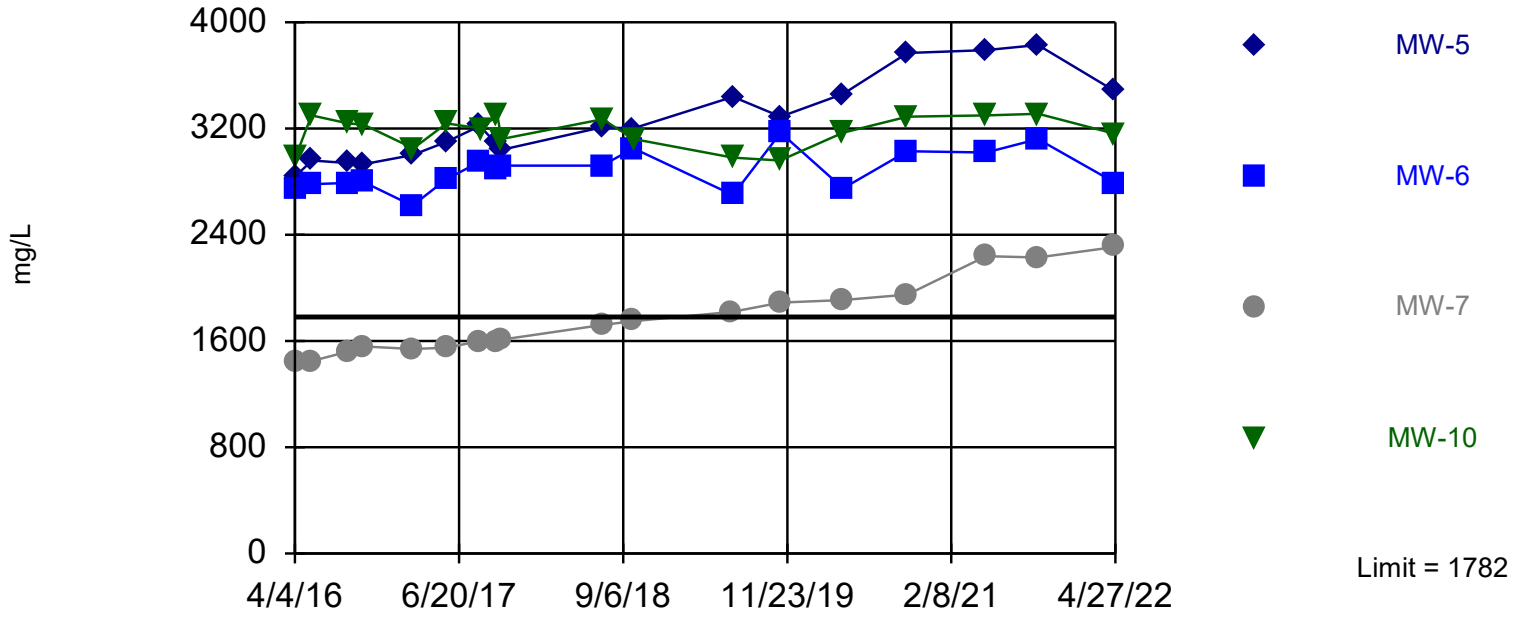
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1576, Std. Dev.=78.31, n=18. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9634, critical = 0.897. Report alpha = 0.0394. Individual comparison alpha = 0.01. 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: Total Dissolved Solids Analysis Run 10/21/2022 8:04 AM View: Original Wells

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

CCR Wells Confidence Interval (95%)

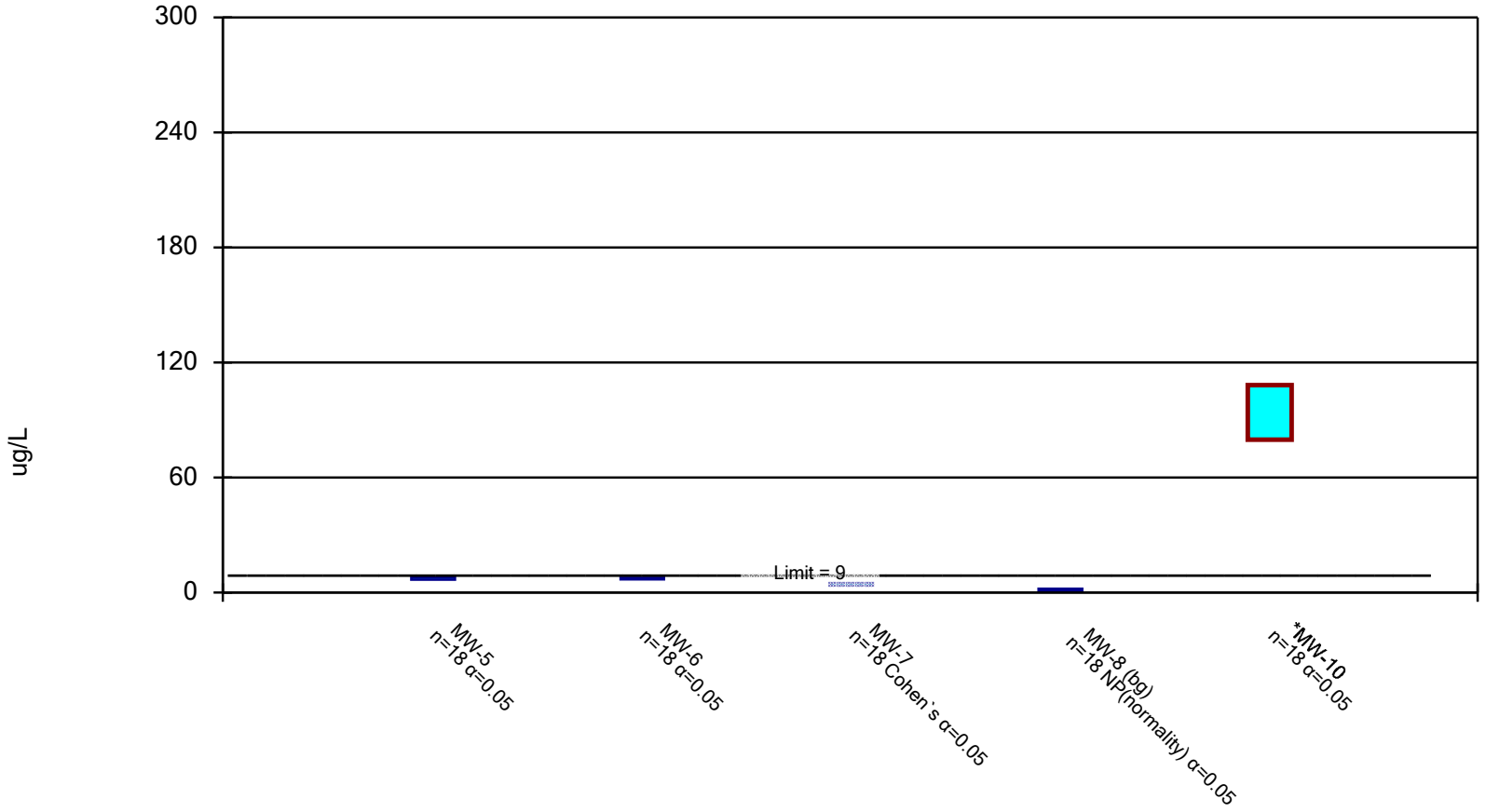
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 10/26/2022, 2:43 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt (ug/L)	MW-5	7.919	6.693	9	No	18	0	No	0.05	Param.
Cobalt (ug/L)	MW-6	7.715	6.888	9	No	18	0	No	0.05	Param.
Cobalt (ug/L)	MW-7	4.941	3.545	9	No	18	27.78	No	0.05	Param.
Cobalt (ug/L)	MW-8 (bg)	2	1.02	9	No	18	33.33	No	0.05	NP (normality)
Cobalt (ug/L)	**MW-10**	**108.1**	**79.72**	**9**	**Yes**	**18**	**0**	**No**	**0.05**	**Param.**
Lithium (ug/L)	MW-5	37.08	31.86	40	No	18	0	No	0.05	Param.
Lithium (ug/L)	**MW-6**	**46.44**	**42.42**	**40**	**Yes**	**18**	**0**	**x^2**	**0.05**	**Param.**
Lithium (ug/L)	MW-7	30	26.3	40	No	18	0	No	0.05	NP (normality)
Lithium (ug/L)	MW-8 (bg)	12.28	7.709	40	No	18	22.22	No	0.05	Param.
Lithium (ug/L)	MW-10	10.8	7.405	40	No	18	16.67	No	0.05	Param.

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Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



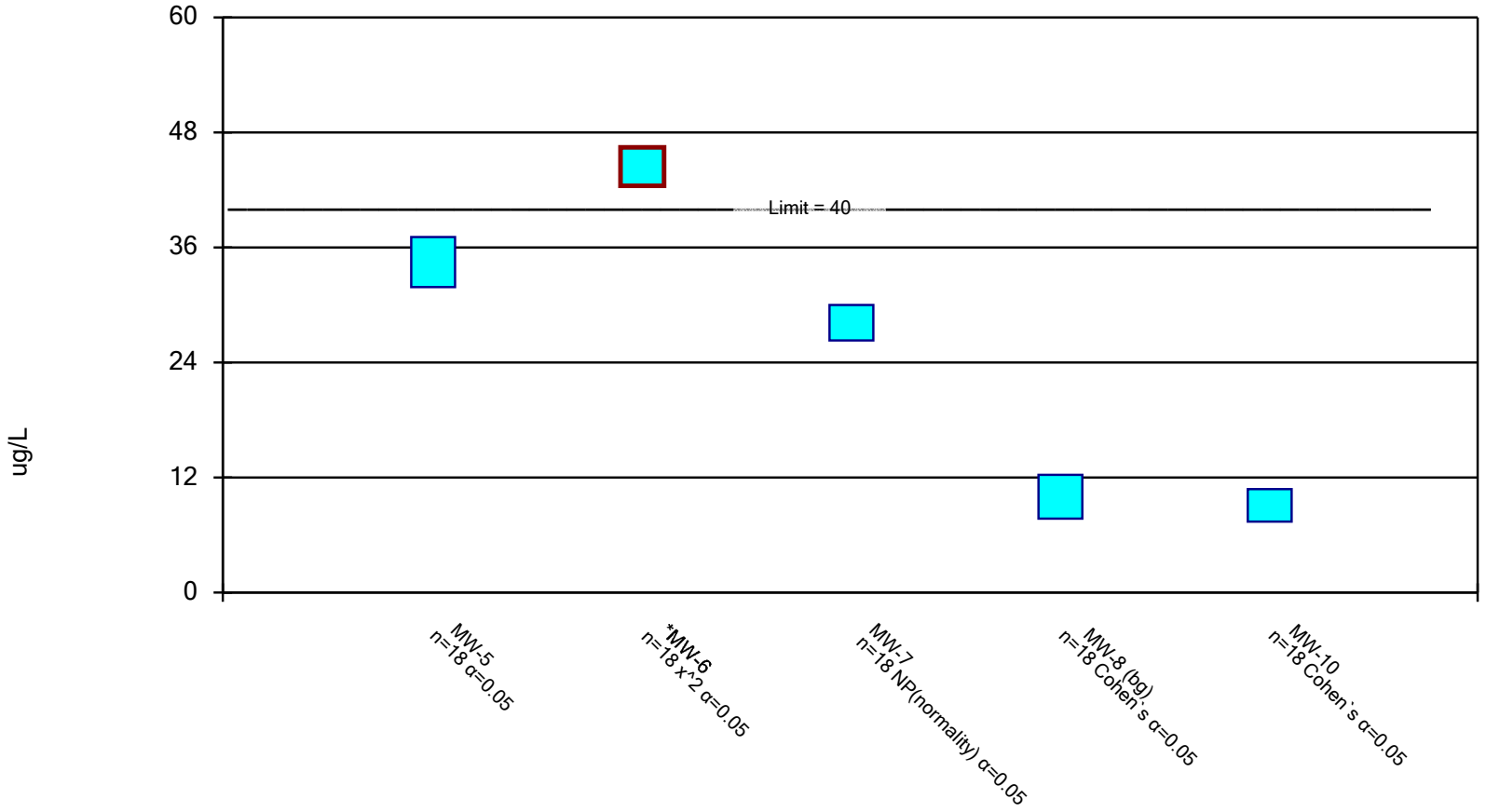
Constituent: Cobalt Analysis Run 10/26/2022 2:42 PM View: Original Wells - SSI

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 10/26/2022 2:42 PM View: Original Wells - SSI

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

December 21, 2022

Mr. Mike Mizell
Big Rivers Electric Corporation
201 3rd Street
Henderson, KY 42419

Re: Statistical Evaluation of September 2022 Assessment Monitoring Groundwater Data
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky
Agency Interest ID #: 3319
Activity I.D. #: AIN2014001

Dear Mr. Mizell:

This letter presents the results of the statistical evaluation of analytical data from the September 2022 assessment monitoring event performed at the D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky in accordance with the requirements of U.S. Environmental Protection Agency's *Standards for the Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments (40 Code of Federal Regulations [CFR] Part 257, Subpart D)*. This letter also presents a comparison of the September 2022 sampling results to groundwater protection standards (GWPSs). The GWPSs for the groundwater monitoring network were reviewed and updated as part of the statistical evaluation completed for the September 2022 sampling event and are presented on Table 1. These GWPSs will continue to be reviewed and updated as additional data are collected. A comparison of the September 2022 data to the updated GWPSs is presented on Table 2. The statistical evaluation presented herein was performed in accordance with the *Update to Certification of Statistical Method for Evaluating Groundwater in accordance with 40 CFR § 257.93 at D.B Wilson Station Phase II CC Landfill in Centertown, Kentucky* dated May 25, 2022.

In September 2022, the Phase II CCR Landfill Groundwater Monitoring Well Network was sampled for Appendix III and Appendix IV parameters per the requirements of 40 CFR §257.95(d)(1). Interwell prediction limit statistical analyses were performed for these well/constituent pairs and are discussed subsequently. GWPSs were also developed in accordance with 40 CFR §257.95(h) which describes a GWPS as the higher value between a determined background concentration for a site and the established maximum concentration limit (MCL) or the GWPS criteria for select Appendix IV parameters without an MCL presented in 40 CFR §257.95(h)(2). This letter presents the results of the statistical evaluation of the September 2022 assessment monitoring event for inclusion in the Phase II CCR Landfill Operating Record.

Statistical Evaluation of Phase II CCR Landfill Compliance Monitoring Well Network Evaluation

A summary of the interwell prediction limit evaluation was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in September 2022 CCR compliance (downgradient) monitoring wells MW-5, MW-6, MW-7, and MW-10 to calculated prediction limits (i.e., background limits) that were established using data collected from April of 2016 through September of 2022 from upgradient monitoring well MW-8. The fluoride non-detect result for MW-5 was rejected (UR) during data validation due to MS/MSD recoveries below the lab and NFGI QC limits (see data validation memorandum for discussion and qualification). Note, any data qualified as rejected during the data review were excluded from the statistical analysis. Certain parameters were detected in September 2022 at concentrations above the calculated background limits (equivalent to the MW-8 prediction limits), and a summary is included in Attachment 1. This included the following well/constituent pairs for downgradient compliance monitoring wells with statistically significant increases (SSIs) above calculated background limits:

Appendix III Parameters:
- Boron (MW-5, MW-6, MW-7, and MW-10)
- Calcium (MW-5, MW-6, MW-7, and MW-10)
- Chloride (MW-5, MW-6, MW-7, and MW-10)
- Sulfate (MW-10)
- Total Dissolved Solids (TDS) (MW-5, MW-6, MW-7, and MW-10)

Appendix IV Parameters:
- Cobalt (MW-10)
- Lithium (MW-5, MW-6, and MW-7)

Results of exceedances of background were generally consistent with the 2019 through April 2022 statistical results. The reported September 2022 SSI for sulfate (MW-10) was not present in April 2022. All other above-noted Appendix III SSIs for September 2022 were also present in the April 2022 statistical analysis. Likewise, the Appendix IV SSIs for cobalt and/or lithium continue to occur at downgradient compliance monitoring wells.

The Appendix IV constituents with SSIs (cobalt and lithium) were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the GWPS by calculating the lower confidence limit (LCL) at 95% confidence for each well and constituent using all the

Baseline, Detection, and Assessment monitoring results collected to date from each monitoring well. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS. The comparison of the calculated LCLs with the GWPSs for cobalt and lithium at downgradient compliance monitoring wells MW-5, MW-6, MW-7, and MW-10 resulted in the following well/constituent pairs with SSLs above the GWPS:

- Cobalt (MW-10)

The LCLs for the remaining well/constituent pairs for cobalt and lithium are less than the GWPS and thus are not considered SSLs. Attachment 1 provides a summary of the calculated LCLs in comparison with the GWPSs. Results of SSLs above the GWPSs were generally consistent with the 2021 results. In 2021, the reported SSLs above GWPS for cobalt (MW-5 and MW-6) were not identified as SSLs above the GWPS in September 2022. The reported April 2022 SSL for lithium (MW-6) was not present in September 2022.

Given that certain Appendix III and IV constituents were observed within the Phase II CCR Landfill groundwater monitoring network at concentrations above their respective calculated background limit and/or the LCL for certain Appendix IV constituents was greater than the corresponding GWPSs, these results do not warrant a transition to detection monitoring per the requirements of 40 CFR §257.95(f) and assessment monitoring will continue for the next first half semiannual monitoring event in 2023.

Sincerely,

Burns & McDonnell Engineering Company, Inc.



Chris Hoglund, PG
Project Manager

Attachments:

Table 1 – Summary of Groundwater Protection Standards
Table 2 – Summary of April 2022 Analytical Results

Attachment 1 – Sanitas™ Statistical Outputs for Phase II CCR Landfill Compliance Monitoring Network

cc: Greg Dick, BREC Wilson Station
Diana Merritt, BREC Wilson Station

TABLES

Table 1
Calculated Background and Groundwater Protection Standards for Groundwater
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

Detection Constituents (Appendix III)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Boron	mg/L	0.0518	--	--	--
Calcium	mg/L	349	--	--	--
pH (field)	SU	4.67 - 6.84	--	--	--
TDS	mg/L	1787	--	--	--
Chloride	mg/L	5.638	--	--	--
Fluoride	mg/L	1.21	4	--	--
Sulfate	mg/L	2180	--	--	--
Assessment Constituents (Appendix IV)	**Units**	**Background***	**MCL**	**40 CFR §257.95(h)(2) Criteria**	**Groundwater Protection Standard**
Antimony	mg/L	0.0025	0.006	--	0.006
Arsenic	mg/L	0.0144	0.01	--	0.0144
Barium	mg/L	0.07	2	--	2
Beryllium	mg/L	0.002	0.004	--	0.004
Cadmium	mg/L	0.0005	0.005	--	0.005
Chromium	mg/L	0.0224	0.1	--	0.1
Cobalt	mg/L	0.009	--	0.006	0.009
Fluoride	mg/L	1.21	4	--	4
Lead	mg/L	0.012	--	0.015	0.015
Lithium	mg/L	0.02407	--	0.04	0.04
Mercury	mg/L	0.005	0.002	--	0.005
Molybdenum	mg/L	0.0187	--	0.1	0.1
Combined Radium 226 and 228**	pCi/L	2.94	5	--	5
Selenium	mg/L	0.0015	0.05	--	0.05
Thallium	mg/L	0.001	0.002	--	0.002

Notes:

*Background concentrations were determined utilizing interwell prediction limits (Attachment 1). Upgradient Monitoring Well MW-8 were used to calculate background concentrations. This included background data ranging from April 2016 through September 2022.

**Combined radium is reported with an uncertainty range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

mg/L - milligrams per Liter

pCi/L - picocuries per Liter

MCL - Maximum Contaminant Level

SU - standard units

Table 2
Summary of April 2022 Groundwater Results
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

		Sample Location:			MW-5	MW-6	MW-7	MW-8	MW-10	MW-4D	MW-10D
		Sample Date:	Calculated Background[1]	GWPS[2]	9/26/2022	9/26/2022	9/27/2022	9/26/2022	9/27/2022	9/27/2022	9/27/2022
		Laboratory ID(s):			2093399-01	2093400-01 2093404-01	2093402-01 2111670-01[5]	2093403-01	2093383-01	2093398-01	2093388-01
		All analytes excl. Radium/Radium only				Field Duplicate[3]					
		Note(s):									
Analytical Method	**Analyte**	**Unit**			**CCR Compliance Monitoring Well Network**					**Characterization Monitoring Wells**	
Appendix III - Detection Monitoring											
6010B	Boron	mg/l	0.0518	--	**0.73** M2	**0.58**	**2.93** D1	<0.10 U	**0.60**	**11.3** D1	**3.11** D1
6010B	Calcium	mg/l	349	--	**580** D1,M3	**505** D1	**449** D1	228 D1	**483** D1	**740** D1	**548** D1
300.0 REV 2.1	Chloride	mg/l	5.638	--	**216** D,J+	**25.3** D	**17.4** D	3.7 H2	**61.1**	**781** D	**195** D
300.0 REV 2.1	Fluoride	mg/l	1.21	4	<0.20 UR,M1	<0.20 U	<1.00 U	<1.00 D,U	<0.20 U	<0.20 U	0.35
300.0 REV 2.1	Sulfate	mg/l	2180	--	1970 D	1810 D	1350 D1	935 D1	**2660** D1	**2380** D1	1920.0 D1
In Situ	pH (Field Measurement)	su	4.67 - 6.84	--	4.76	4.76	6.58	4.67	6.1	6.59	6.67
2340 C-2011	Total Dissolved Solids	mg/l	1787	--	**3580**	**2920**	**2290**	1420	**3220**	**4100**	**2660**
Detected Appendix IV - Assessment Monitoring[3]											
6020A	Antimony	mg/l	0.0025	0.006	<0.005 U,M2,V1	<0.005 U	<0.005 U	<0.005 U	<0.005 U,V1	<0.005 U	<0.005 U
6020A	Arsenic	mg/l	0.0144	0.0144	0.0026 M2	0.0049	0.0034	0.0053	0.0034	0.0028	0.0036
6020A	Barium	mg/l	0.07	2	0.01 M2	0.013	0.012	0.022	0.010	0.015	0.018
6020A	Beryllium	mg/l	0.002	0.004	<0.0020 U,M2,V1	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U,V1	<0.0020 U	<0.0020 U,V1
6020A	Cadmium	mg/l	0.0005	0.005	<0.0010 U,M2	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U
6020A	Chromium	mg/l	0.0224	0.1	<0.0020 U,M2	<0.0020 U	<0.0020 U	0.0015 J	0.0006 J	<0.0020 U	<0.0020 U
6020A	Cobalt	mg/l	0.009	0.009	0.008 M2	0.008	<0.004 U	<0.004 U	**0.108**	**0.011**	<0.0040 U
300.0 REV 2.1	Fluoride	mg/l	1.21	4	<0.20 UR,M1	<0.20 U	<1.00 U	<1.00 D,U	<0.20 U	<0.20 U	0.35
6020A	Lead	mg/l	0.012	0.015	<0.002 U,M2	<0.002 U	<0.002 U	0.0007 J	<0.002 U	<0.002 U	<0.002 U
6020A	Lithium	mg/l	0.0247	0.04	**0.03** M2	**0.05**	**0.03**	0.01 J	0.009 V1,J	**0.17**	**0.07**
6020A	Mercury	mg/l	0.005	0.002	<0.0005 UJ,M2	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U
6020A	Molybdenum	mg/l	0.0187	0.1	0.004 M2,J	0.007 J	0.006 J	0.01	<0.01 U	0.007 J	0.004 J
903.1/904.0	Combined Radium 226 and 228[4]	pCi/l	2.94	5	1.38 J	0.842 J	2.16 J	1.67 J	2.5 J	1.83 J	1.39 J
6020A	Selenium	mg/l	0.0015	0.05	<0.003 U,M2	<0.003 U	<0.003 U	<0.003 U	<0.003 U	0.001 J	<0.003 U
6020A	Thallium	mg/l	0.001	0.002	<0.0020 U,M2	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U

Notes

1 - Background concentrations were determined utilizing interwell prediction limits. Upgradient well MW-8 was used to determine these background concentrations. This included data ranging from April 2016 through September 2022.

2 - GWPSs were developed in accordance with §257.95(h).

3 - The highest concentration is reported between MW-6 and MW-105R and their associated field duplicate sample.

4 - Combined radium is reported with an associate range. However, this range cannot be incorporated into statistical calculations as it varies per result and is not a standard value. Therefore, to maintain consistency in reporting these results, the reported laboratory concentration was used for the statistical analyses.

5 - MW-7 was resampled 11/1/202 for Combined Radium 226 & 228 due to origial sample lost by lab.

Bold - Analyte detected above calculated background concentration.

Parameters were detected in wells located downgradient of the CCR Landfill at a concentration greater than the GWPS.

CCR - coal combustion residuals

D - Results reported from dilution

D1 - Sample required dilution due to high concentration of target analyte

GWPS - Groundwater Protection Standard

H2 - Initial analysis within holding time. Reanalysis was past holding time.

J (+/-) -estimated concentration (bias indicator [high + / low -])

JU - = Estimated trace concentration was qualified as non detect during data review

M1 - Matrix spike recovery was high; the method control sample recovery was acceptable.

M2 - Matrix spike recovery was low; the method control sample recovery was acceptable.

mg/l - milligram per liter

pCi/L - picocurie per liter

su - standard unit

U - Non Detect at the identified concentration

UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.

UR = Nondetect result was rejected during data revew.

V1 - CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

Table 2
Summary of April 2022 Groundwater Results
D.B. Wilson Station Phase II CCR Landfill in Centertown, Kentucky

		Sample Location:			MW-102	MW-104	MW-105R	MW-110	MW-111	MW-112	MW-113	MW-114
		Sample Date:	Calculated Background[1]	GWPS[2]	9/29/2022	9/28/2022	9/29/2022	9/28/2022	9/30/2022	9/30/2022	9/28/2022	9/28/2022
		Laboratory ID(s):			2093384-01	2093393-01	2093387-01 2093405-01	2093389-01	2093390-01	2093391-01	2093392-01	2093385-01
		All analytes excl. Radium/Radium only					Field Duplicate[3]					
		Note(s):										
Analytical Method	**Analyte**	**Unit**			**Characterization Monitoring Wells**							
Appendix III - Detection Monitoring												
6010B	Boron	mg/l	0.0518	--	<0.10 U	<0.10 M2,U	<0.10 U	<0.10 U	**0.22**	0.15	<0.10 U	<0.10 U
6010B	Calcium	mg/l	349	--	97.8 D1	**426** D1,M3	204 D1	38.3 D1	**637** D1	283 D1	256 D1	130 D1
300.0 REV 2.1	Chloride	mg/l	5.638	--	**31.8** H2	**10.8**	**11.7**	**9.7**	3.7 M2,J-	3.6 H2	**37.6**	**31.6**
300.0 REV 2.1	Fluoride	mg/l	1.21	4	0.29	<0.20 U	<0.20 UJ	0.24	0.24 M2,J-	<0.20 U	<0.2 U	0.22
300.0 REV 2.1	Sulfate	mg/l	2180	--	302 H2	1070	418.0 D,J-	68.4	**2640** D,M2	602 D	1070.0 D	151.0
In Situ	pH (Field Measurement)	su	4.67 - 6.84	--	6.67	6.77	6.71	6.65	6.59	6.82	6.62	6.71
2340 C-2011	Total Dissolved Solids	mg/l	1787	--	1040	1640	1010	270	**3300**	1180	1660	864
Detected Appendix IV - Assessment Monitoring[3]												
6020A	Antimony	mg/l	0.0025	0.006	<0.005 U	<0.005 UJ	<0.005 U,V1	<0.005 U,V1	<0.005 V1,U	<0.005 U,V1	<0.005 U	<0.005 U,V1
6020A	Arsenic	mg/l	0.0144	0.0144	0.0038	0.0006 M2, J	0.0011	0.0015	0.0026	0.0019	**0.0229**	0.0048
6020A	Barium	mg/l	0.07	2	0.046	0.034 M2,J-	0.033	0.050	0.019	0.032	0.029	0.062
6020A	Beryllium	mg/l	0.002	0.004	<0.0020 U, V1	<0.0020 UJ	<0.0020 U,V1	<0.0020 U,V1	<0.0020 U	<0.0020 U,V1	<0.0020 U,V1	<0.0020 U,V1
6020A	Cadmium	mg/l	0.0005	0.005	<0.0010 U	<0.0010 M2,UJ	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U	<0.0010 U
6020A	Chromium	mg/l	0.0224	0.1	<0.002 U	<0.0020 M2,U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U	<0.0020 U
6020A	Cobalt	mg/l	0.009	0.009	<0.004 U	<0.004 M2,U	<0.004 U	<0.004 U	**0.011**	0.005	**0.018**	<0.004 U
300.0 REV 2.1	Fluoride	mg/l	1.21	4	0.29	<0.20 U	<0.20 UJ	0.24	0.24 M2,J-	<0.20 U	<0.2 U	0.22
6020A	Lead	mg/l	0.012	0.015	<0.002 U	<0.002 M2,UJ	0.0005 J	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U
6020A	Lithium	mg/l	0.0247	0.04	<0.02 U, V1	0.02 M2,J-	**0.03**	<0.02 V1,U	**0.03**	0.01 V1,J	**0.03**	0.02
6020A	Mercury	mg/l	0.005	0.002	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 UJ	<0.0005 U	<0.0005 U	<0.0005 U
6020A	Molybdenum	mg/l	0.0187	0.1	<0.01 U	<0.01 M2,U	0.002 J	<0.01 U	0.003 J	0.002 J	0.007 J	0.004 J
903.1/904.0	Combined Radium 226 and 228[4]	pCi/l	2.94	5	0.65 J	1.83 J	3.30 J	1.69 J	1.65 J	1.22 J	0.969 J	1.22 J
6020A	Selenium	mg/l	0.0015	0.05	<0.003 U	<0.003 M2,U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U
6020A	Thallium	mg/l	0.001	0.002	<0.0020 U	<0.0020 M2,UJ	<0.0020 U	<0.002 U	0.0001 U	<0.0020 U	<0.02 U	<0.002 U

Notes

1 - Background concentrations were determined utilizing interwell prediction limits. Upgradient well MW-8 was us

2 - GWPSs were developed in accordance with §257.95(h).

3 - The highest concentration is reported between MW-6 and MW-105R and their associated field duplicate samp

4 - Combined radium is reported with an associate range. However, this range cannot be incorporated into statist these results, the reported laboratory concentration was used for the statistical analyses.

5 - MW-7 was resampled 11/1/202 for Combined Radium 226 & 228 due to origial sample lost by lab.

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Parameters were detected in wells located downgradient of the CCR Landfill at a concentration greater than the C

CCR - coal combustion residuals

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GWPS - Groundwater Protection Standard

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J (+/-) -estimated concentration (bias indicator [high + / low -])

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M1 - Matrix spike recovery was high; the method control sample recovery was acceptable.

M2 - Matrix spike recovery was low; the method control sample recovery was acceptable.

mg/l - milligram per liter

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su - standard unit

U - Non Detect at the identified concentration

UJ = Nondetect result was qualified as estimated at the reporting limit during data revew.

UR = Nondetect result was rejected during data revew.

V1 - CCV recovery was above method acceptance limits. This target analyte not detected in the sample.

ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS FOR PHASE II CCR LANFILL COMPLIANCE MONITORING WELL NETWORK

CCR Wells Interwell Prediction Limit

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 12/20/2022, 3:30 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-5	0.0025	n/a	9/26/2022	0.0025ND	No	18	61.11	n/a	0.04893	NP Inter (NDs)
Antimony (mg/L)	MW-6	0.0025	n/a	9/26/2022	0.0025ND	No	18	61.11	n/a	0.04893	NP Inter (NDs)
Antimony (mg/L)	MW-7	0.0025	n/a	9/27/2022	0.0025ND	No	18	61.11	n/a	0.04893	NP Inter (NDs)
Antimony (mg/L)	MW-10	0.0025	n/a	9/27/2022	0.0025ND	No	18	61.11	n/a	0.04893	NP Inter (NDs)
Arsenic (ug/L)	MW-5	14.4	n/a	9/26/2022	2.6	No	19	0	n/a	0.04664	NP Inter (normality)
Arsenic (ug/L)	MW-6	14.4	n/a	9/26/2022	4.9	No	19	0	n/a	0.04664	NP Inter (normality)
Arsenic (ug/L)	MW-7	14.4	n/a	9/27/2022	3.4	No	19	0	n/a	0.04664	NP Inter (normality)
Arsenic (ug/L)	MW-10	14.4	n/a	9/27/2022	3.4	No	19	0	n/a	0.04664	NP Inter (normality)
Barium (ug/L)	MW-5	70	n/a	9/26/2022	10	No	18	0	n/a	0.04893	NP Inter (normality)
Barium (ug/L)	MW-6	70	n/a	9/26/2022	12	No	18	0	n/a	0.04893	NP Inter (normality)
Barium (ug/L)	MW-7	70	n/a	9/27/2022	12	No	18	0	n/a	0.04893	NP Inter (normality)
Barium (ug/L)	MW-10	70	n/a	9/27/2022	10	No	18	0	n/a	0.04893	NP Inter (normality)
Beryllium (ug/L)	MW-5	0.002	n/a	9/26/2022	0.001ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Beryllium (ug/L)	MW-6	0.002	n/a	9/26/2022	0.001ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Beryllium (ug/L)	MW-7	0.002	n/a	9/27/2022	0.001ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Beryllium (ug/L)	MW-10	0.002	n/a	9/27/2022	0.001ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Boron (ug/L)	**MW-5**	**51.8**	**n/a**	**9/26/2022**	**730**	**Yes**	**19**	**42.11**	**n/a**	**0.04664**	**NP Inter (normality)**
Boron (ug/L)	**MW-6**	**51.8**	**n/a**	**9/26/2022**	**580**	**Yes**	**19**	**42.11**	**n/a**	**0.04664**	**NP Inter (normality)**
Boron (ug/L)	**MW-7**	**51.8**	**n/a**	**9/27/2022**	**2930**	**Yes**	**19**	**42.11**	**n/a**	**0.04664**	**NP Inter (normality)**
Boron (ug/L)	**MW-10**	**51.8**	**n/a**	**9/27/2022**	**600**	**Yes**	**19**	**42.11**	**n/a**	**0.04664**	**NP Inter (normality)**
Cadmium (ug/L)	MW-5	0.5	n/a	9/26/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Cadmium (ug/L)	MW-6	0.5	n/a	9/26/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Cadmium (ug/L)	MW-7	0.5	n/a	9/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Cadmium (ug/L)	MW-10	0.5	n/a	9/27/2022	0.5ND	No	17	88.24	n/a	0.05146	NP Inter (NDs)
Calcium (ug/L)	**MW-5**	**349000**	**n/a**	**9/26/2022**	**580000**	**Yes**	**19**	**0**	**n/a**	**0.04664**	**NP Inter (normality)**
Calcium (ug/L)	**MW-6**	**349000**	**n/a**	**9/26/2022**	**505000**	**Yes**	**19**	**0**	**n/a**	**0.04664**	**NP Inter (normality)**
Calcium (ug/L)	**MW-7**	**349000**	**n/a**	**9/27/2022**	**449000**	**Yes**	**19**	**0**	**n/a**	**0.04664**	**NP Inter (normality)**
Calcium (ug/L)	**MW-10**	**349000**	**n/a**	**9/27/2022**	**483000**	**Yes**	**19**	**0**	**n/a**	**0.04664**	**NP Inter (normality)**
Chloride (mg/L)	**MW-5**	**5.638**	**n/a**	**9/26/2022**	**216**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-6**	**5.638**	**n/a**	**9/26/2022**	**24.4**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-7**	**5.638**	**n/a**	**9/27/2022**	**17.4**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Chloride (mg/L)	**MW-10**	**5.638**	**n/a**	**9/27/2022**	**61.1**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Chromium (ug/L)	MW-5	22.4	n/a	9/26/2022	0.3ND	No	18	38.89	n/a	0.04893	NP Inter (normality)
Chromium (ug/L)	MW-6	22.4	n/a	9/26/2022	0.3ND	No	18	38.89	n/a	0.04893	NP Inter (normality)
Chromium (ug/L)	MW-7	22.4	n/a	9/27/2022	0.3ND	No	18	38.89	n/a	0.04893	NP Inter (normality)
Chromium (ug/L)	MW-10	22.4	n/a	9/27/2022	0.6J	No	18	38.89	n/a	0.04893	NP Inter (normality)
Cobalt (ug/L)	MW-5	9	n/a	9/26/2022	8	No	18	38.89	n/a	0.04893	NP Inter (normality)
Cobalt (ug/L)	MW-6	9	n/a	9/26/2022	8	No	18	38.89	n/a	0.04893	NP Inter (normality)
Cobalt (ug/L)	MW-7	9	n/a	9/27/2022	2ND	No	18	38.89	n/a	0.04893	NP Inter (normality)
Cobalt (ug/L)	**MW-10**	**9**	**n/a**	**9/27/2022**	**108**	**Yes**	**18**	**38.89**	**n/a**	**0.04893**	**NP Inter (normality)**
Fluoride (mg/L)	MW-5	1.21	n/a	4/27/2022	0.5ND	No	20	5	n/a	0.04456	NP Inter (normality)
Fluoride (mg/L)	MW-6	1.21	n/a	9/26/2022	0.5ND	No	20	5	n/a	0.04456	NP Inter (normality)
Fluoride (mg/L)	MW-7	1.21	n/a	9/27/2022	0.5ND	No	20	5	n/a	0.04456	NP Inter (normality)
Fluoride (mg/L)	MW-10	1.21	n/a	9/27/2022	0.5ND	No	20	5	n/a	0.04456	NP Inter (normality)
Lead (ug/L)	MW-5	12	n/a	9/26/2022	0.25ND	No	18	66.67	n/a	0.04893	NP Inter (NDs)
Lead (ug/L)	MW-6	12	n/a	9/26/2022	0.25ND	No	18	66.67	n/a	0.04893	NP Inter (NDs)
Lead (ug/L)	MW-7	12	n/a	9/27/2022	0.25ND	No	18	66.67	n/a	0.04893	NP Inter (NDs)
Lead (ug/L)	MW-10	12	n/a	9/27/2022	0.25ND	No	18	66.67	n/a	0.04893	NP Inter (NDs)
Lithium (ug/L)	**MW-5**	**24.07**	**n/a**	**9/26/2022**	**30**	**Yes**	**19**	**21.05**	**No**	**0.01**	**Param Inter**
Lithium (ug/L)	**MW-6**	**24.07**	**n/a**	**9/26/2022**	**40**	**Yes**	**19**	**21.05**	**No**	**0.01**	**Param Inter**

CCR Wells Interwell Prediction Limit

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 12/20/2022, 3:30 PM

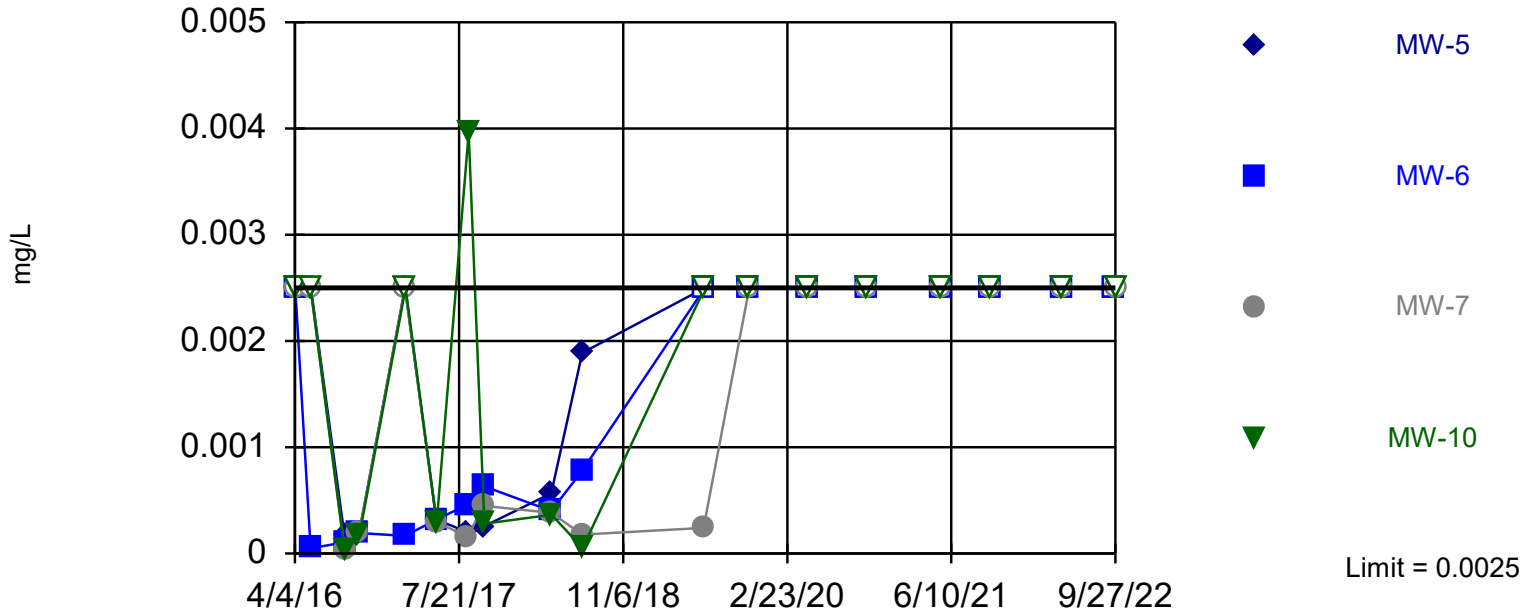
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Lithium (ug/L)	**MW-7**	**24.07**	**n/a**	**9/27/2022**	**30**	**Yes**	**19**	**21.05**	**No**	**0.01**	**Param Inter**
Lithium (ug/L)	MW-10	24.07	n/a	9/27/2022	9J	No	19	21.05	No	0.01	Param Inter
Mercury (ug/L)	MW-5	0.005	n/a	9/26/2022	0.0025ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.005	n/a	9/26/2022	0.0025ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Mercury (ug/L)	MW-7	0.005	n/a	9/27/2022	0.0025ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Mercury (ug/L)	MW-10	0.005	n/a	9/27/2022	0.0025ND	No	17	100	n/a	0.05146	NP Inter (NDs)
Molybdenum (ug/L)	MW-5	18.7	n/a	9/26/2022	4	No	19	0	n/a	0.04664	NP Inter (normality)
Molybdenum (ug/L)	MW-6	18.7	n/a	9/26/2022	7J	No	19	0	n/a	0.04664	NP Inter (normality)
Molybdenum (ug/L)	MW-7	18.7	n/a	9/27/2022	6J	No	19	0	n/a	0.04664	NP Inter (normality)
Molybdenum (ug/L)	MW-10	18.7	n/a	9/27/2022	5ND	No	19	0	n/a	0.04664	NP Inter (normality)
pH [Field] (SU)	MW-5	6.84	4.67	9/26/2022	4.76	No	20	0	n/a	0.08911	NP Inter (normality)
pH [Field] (SU)	MW-6	6.84	4.67	9/26/2022	4.76	No	20	0	n/a	0.08911	NP Inter (normality)
pH [Field] (SU)	MW-7	6.84	4.67	9/27/2022	6.58	No	20	0	n/a	0.08911	NP Inter (normality)
pH [Field] (SU)	MW-10	6.84	4.67	9/27/2022	6.1	No	20	0	n/a	0.08911	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-5	2.94	n/a	9/26/2022	1.38	No	18	0	n/a	0.04893	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-6	2.94	n/a	9/26/2022	0.842	No	18	0	n/a	0.04893	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-7	2.94	n/a	11/1/2022	2.16	No	18	0	n/a	0.04893	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-10	2.94	n/a	9/27/2022	2.5	No	18	0	n/a	0.04893	NP Inter (normality)
Selenium (ug/L)	MW-5	1.5	n/a	9/26/2022	1.5ND	No	18	88.89	n/a	0.04893	NP Inter (NDs)
Selenium (ug/L)	MW-6	1.5	n/a	9/26/2022	1.5ND	No	18	88.89	n/a	0.04893	NP Inter (NDs)
Selenium (ug/L)	MW-7	1.5	n/a	9/27/2022	1.5ND	No	18	88.89	n/a	0.04893	NP Inter (NDs)
Selenium (ug/L)	MW-10	1.5	n/a	9/27/2022	1.5ND	No	18	88.89	n/a	0.04893	NP Inter (NDs)
Sulfate (mg/L)	MW-5	2180	n/a	9/26/2022	1970	No	19	0	n/a	0.04664	NP Inter (normality)
Sulfate (mg/L)	MW-6	2180	n/a	9/26/2022	1710	No	19	0	n/a	0.04664	NP Inter (normality)
Sulfate (mg/L)	MW-7	2180	n/a	9/27/2022	1350	No	19	0	n/a	0.04664	NP Inter (normality)
Sulfate (mg/L)	**MW-10**	**2180**	**n/a**	**9/27/2022**	**2660**	**Yes**	**19**	**0**	**n/a**	**0.04664**	**NP Inter (normality)**
Thallium (ug/L)	MW-5	1	n/a	9/26/2022	1ND	No	18	83.33	n/a	0.04893	NP Inter (NDs)
Thallium (ug/L)	MW-6	1	n/a	9/26/2022	1ND	No	18	83.33	n/a	0.04893	NP Inter (NDs)
Thallium (ug/L)	MW-7	1	n/a	9/27/2022	1ND	No	18	83.33	n/a	0.04893	NP Inter (NDs)
Thallium (ug/L)	MW-10	1	n/a	9/27/2022	1ND	No	18	83.33	n/a	0.04893	NP Inter (NDs)
Total Dissolved Solids (mg/L)	**MW-5**	**1787**	**n/a**	**9/26/2022**	**3580**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-6**	**1787**	**n/a**	**9/26/2022**	**2920**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-7**	**1787**	**n/a**	**9/27/2022**	**2290**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-10**	**1787**	**n/a**	**9/27/2022**	**3220**	**Yes**	**19**	**0**	**No**	**0.01**	**Param Inter**

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 61.11% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Antimony Analysis Run 12/20/2022 3:27 PM View: Original Wells

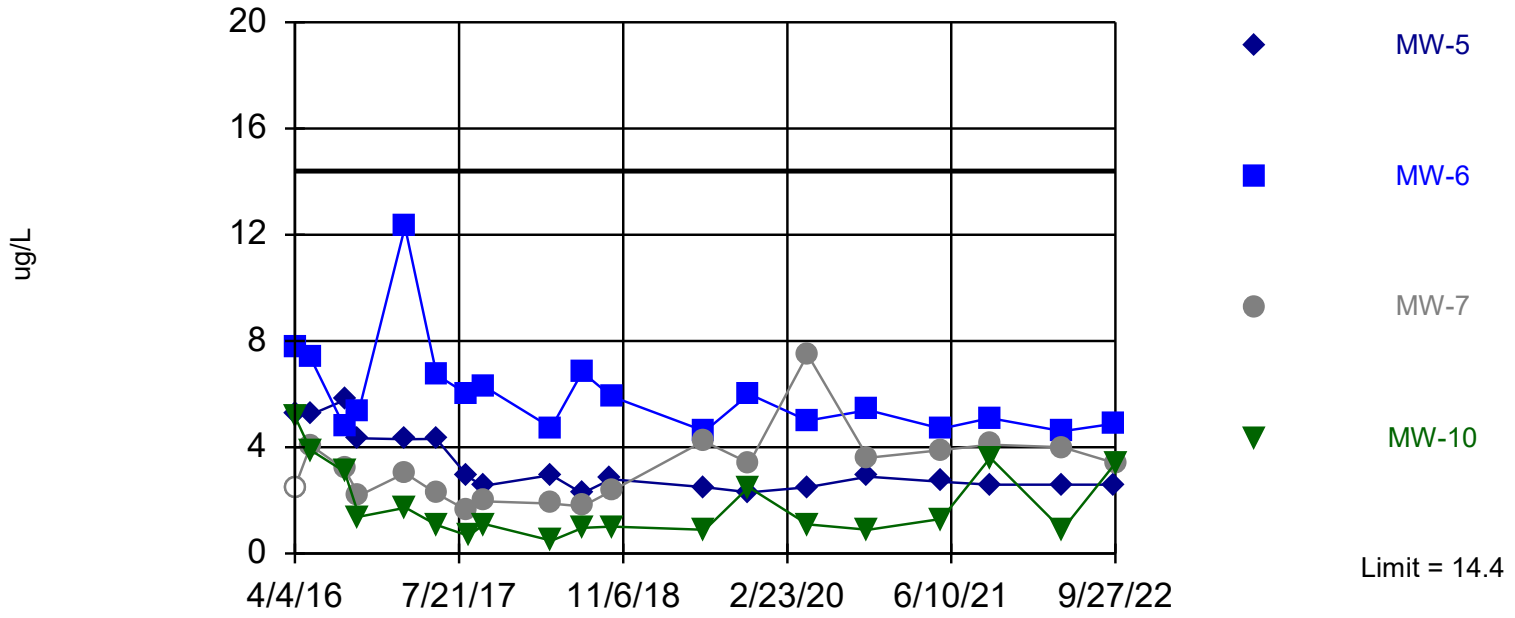
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Sanitas™ v.9.6.36 Software licensed to Burns & McDonnell. EPA
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. Report alpha = 0.1739. Individual comparison alpha = 0.04664. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Arsenic Analysis Run 12/20/2022 3:27 PM View: Original Wells

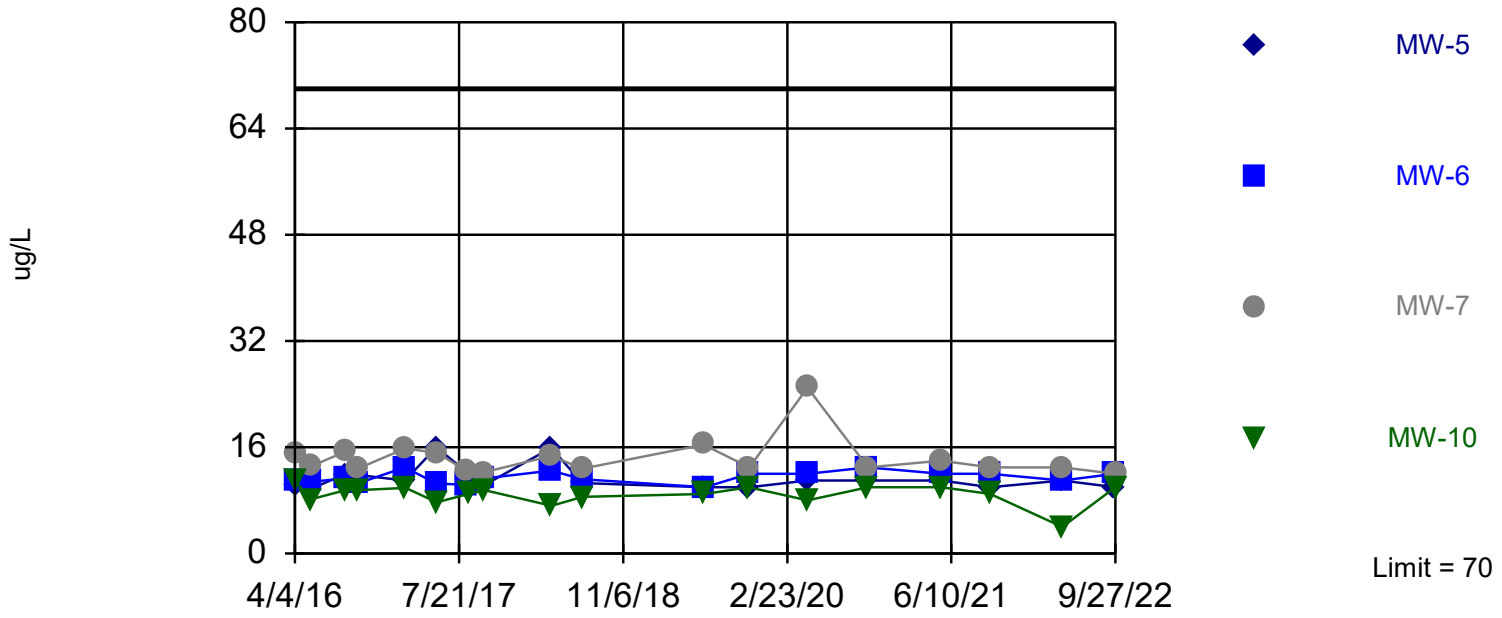
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Sanitas™ v.9.6.36 Software licensed to Burns & McDonnell. EPA

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. Report alpha = 0.1818. Individual comparison alpha = 0.04893. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Barium Analysis Run 12/20/2022 3:27 PM View: Original Wells

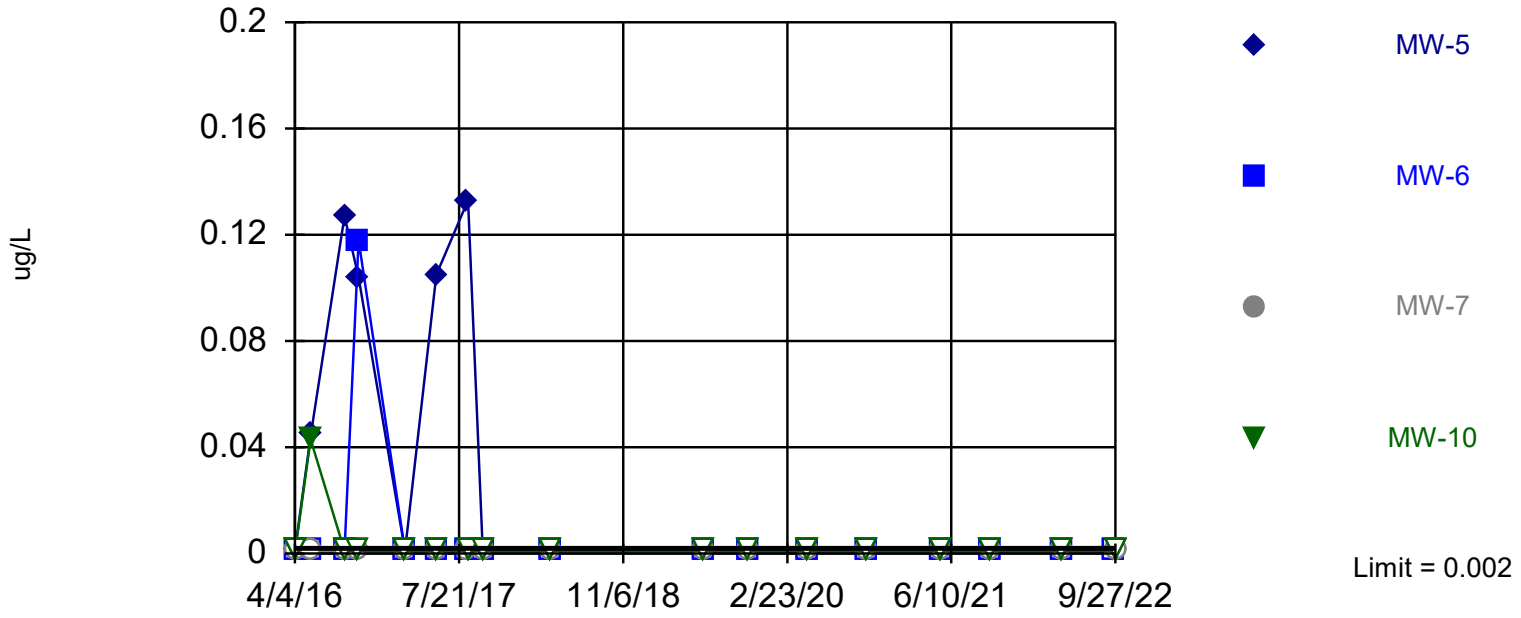
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 17) were censored; limit is most recent reporting limit. Report alpha = 0.1905. Individual comparison alpha = 0.05146. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Beryllium Analysis Run 12/20/2022 3:27 PM View: Original Wells

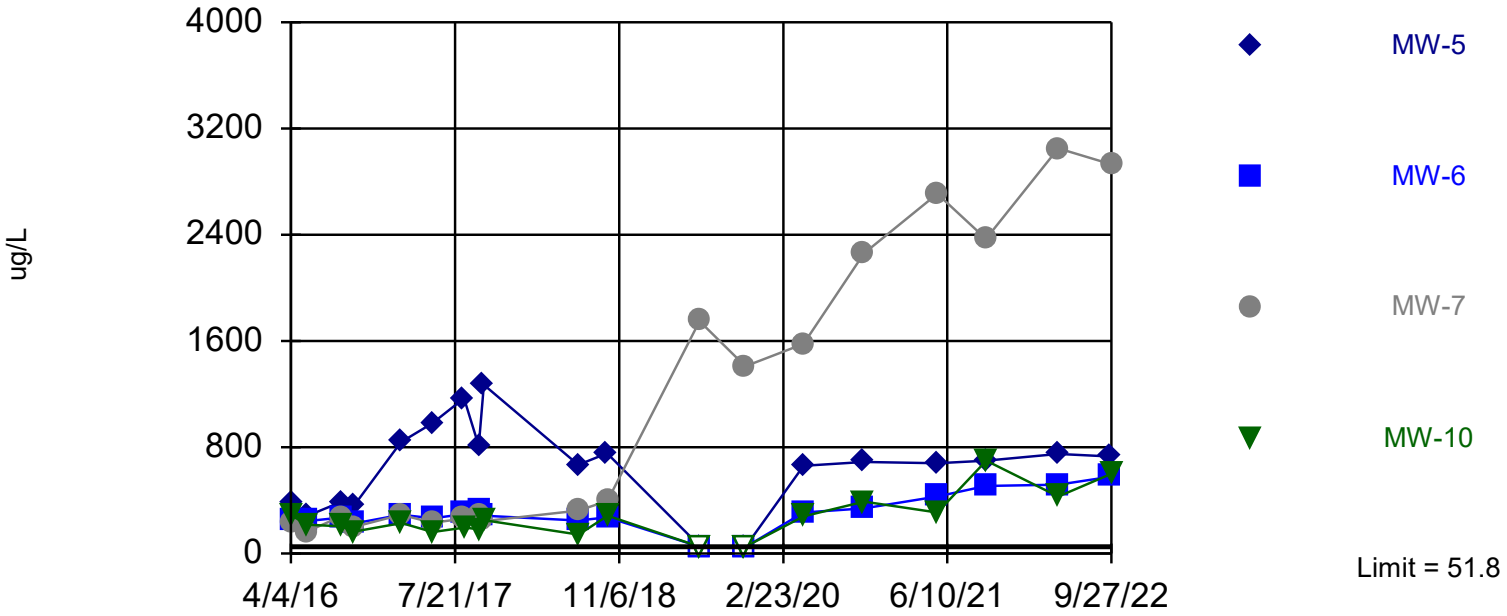
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. 42.11% NDs. Report alpha = 0.1739. Individual comparison alpha = 0.04664. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Boron Analysis Run 12/20/2022 3:27 PM View: Original Wells

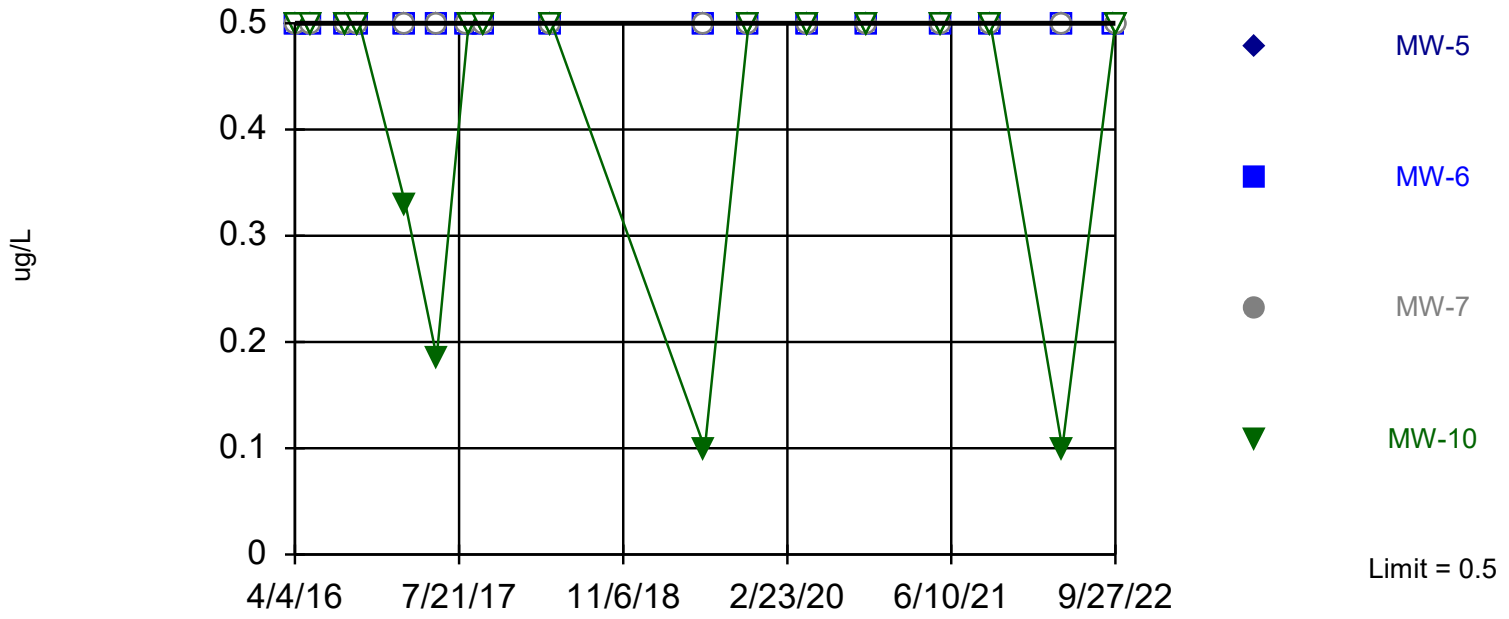
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Sanitas™ v.9.6.36 Software licensed to Burns & McDonnell. EPA
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 17 background values. 88.24% NDs. Report alpha = 0.1905. Individual comparison alpha = 0.05146. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Cadmium Analysis Run 12/20/2022 3:27 PM View: Original Wells

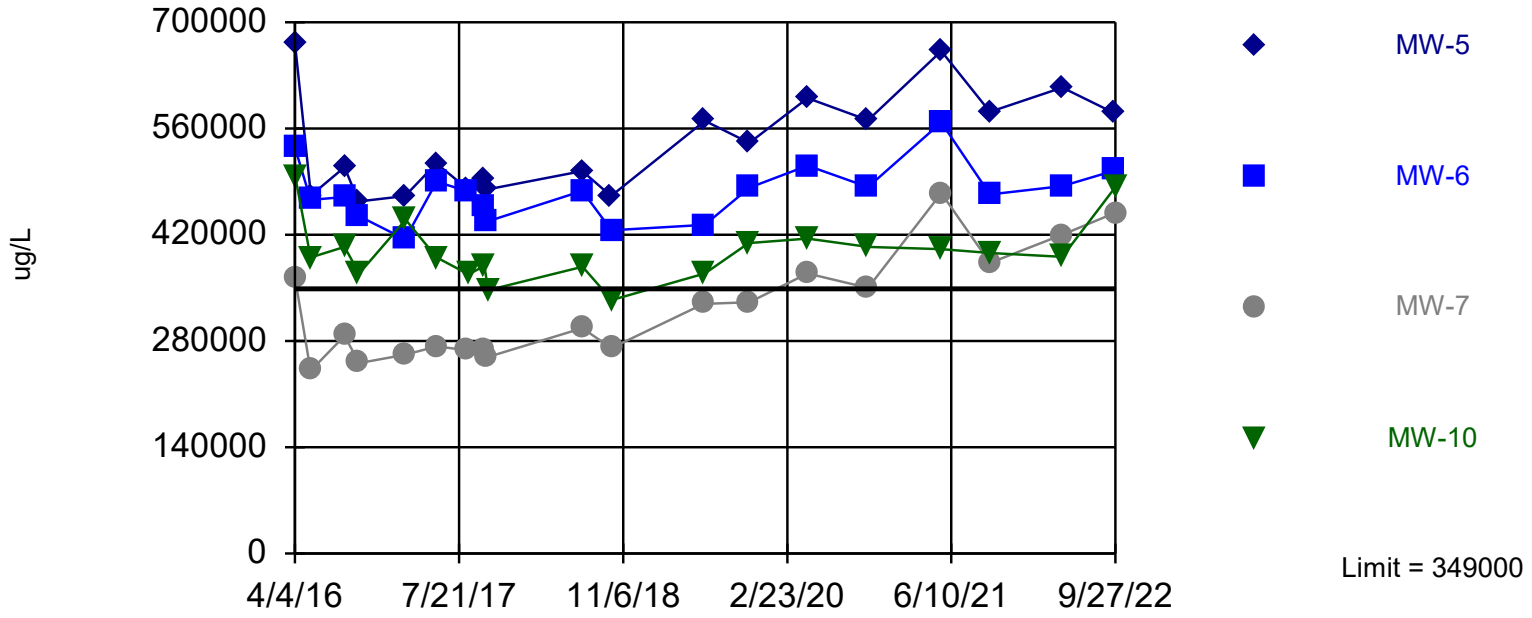
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. Report alpha = 0.1739. Individual comparison alpha = 0.04664. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Calcium Analysis Run 12/20/2022 3:27 PM View: Original Wells

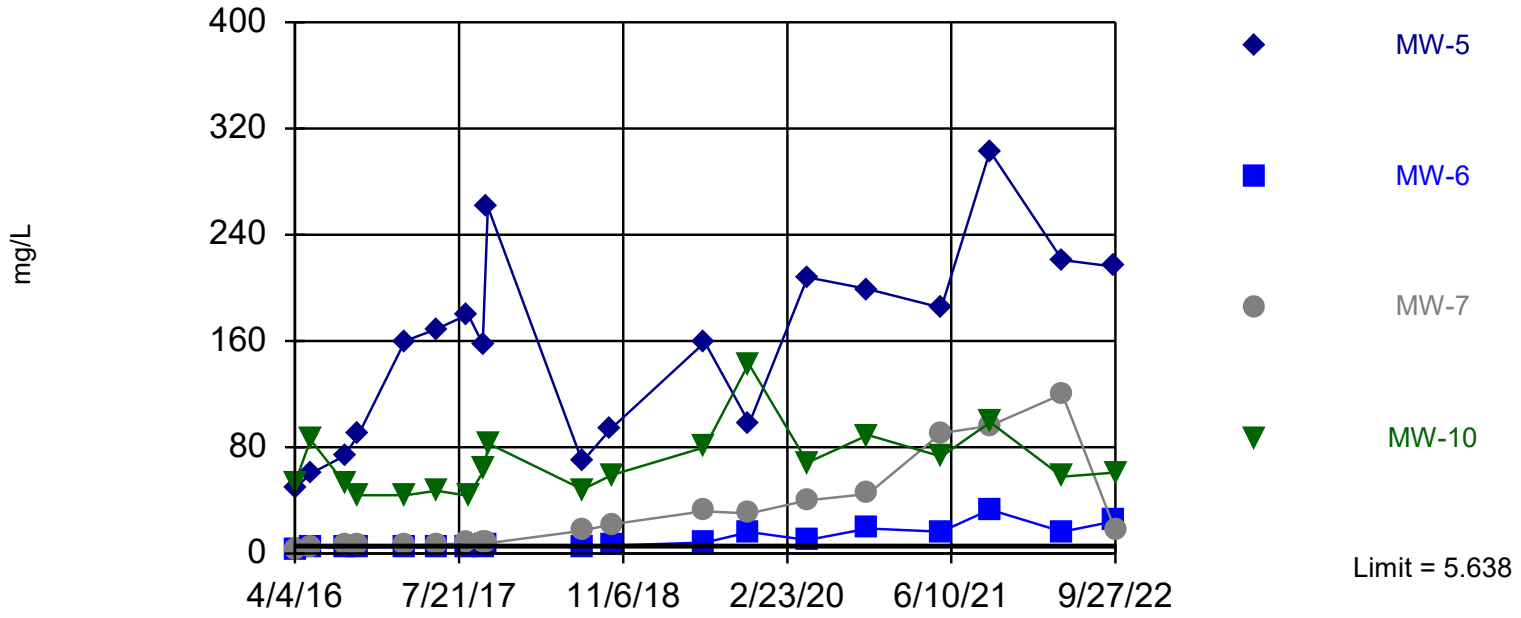
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.281, Std. Dev.=0.5182, n=19. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9227, critical = 0.901. Report alpha = 0.0394. Individual comparison alpha = 0.01. 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 12/20/2022 3:27 PM View: Original Wells

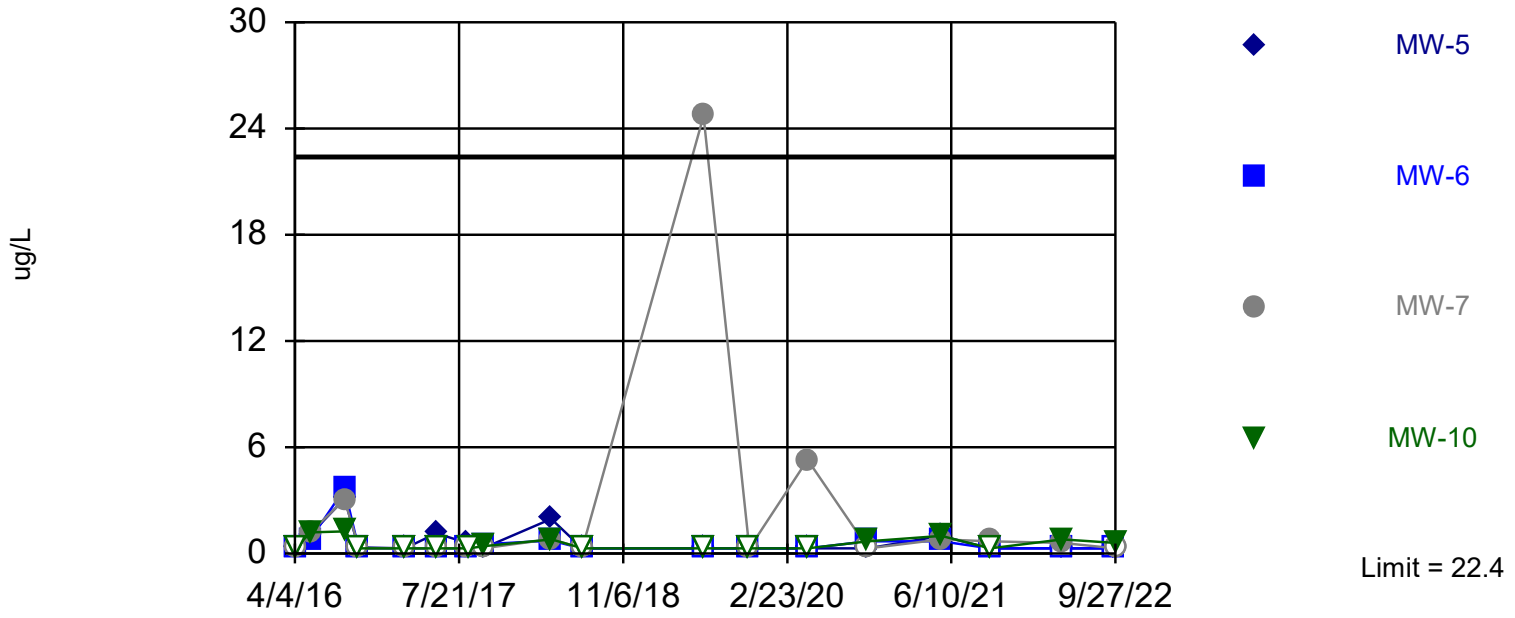
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. 38.89% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Chromium Analysis Run 12/20/2022 3:27 PM View: Original Wells

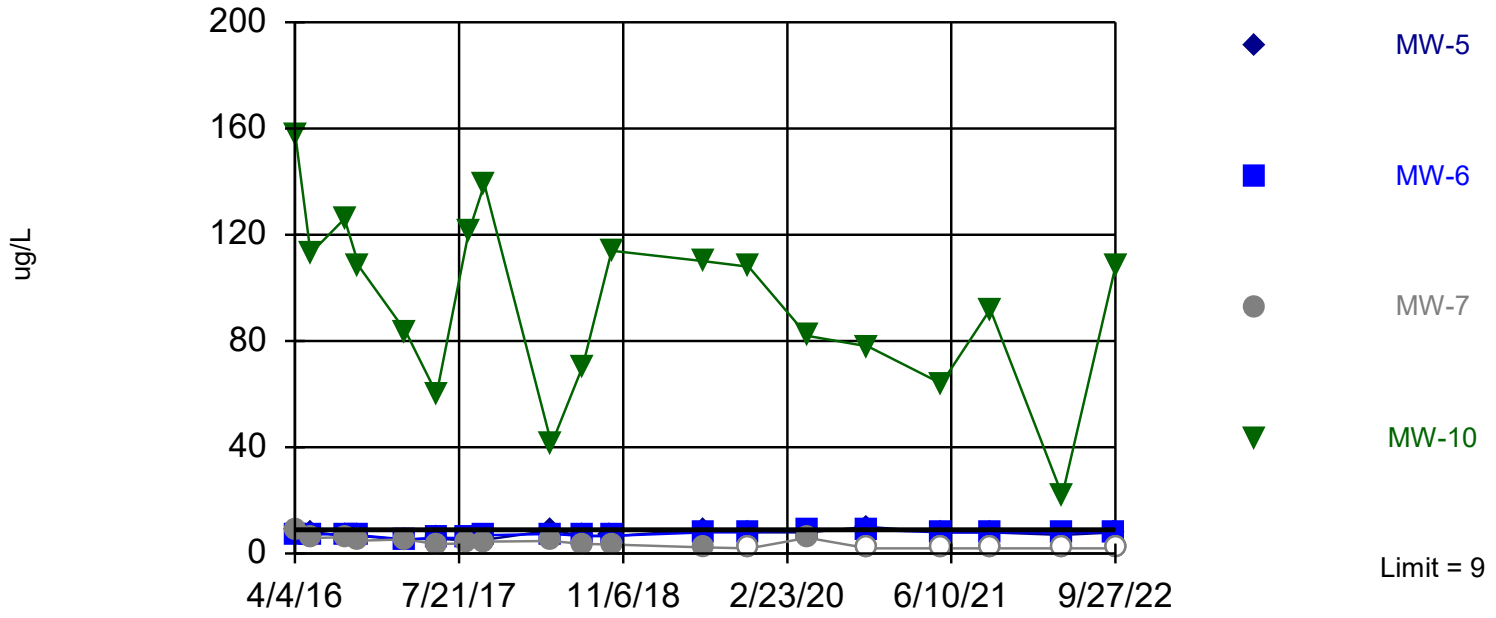
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Exceeds Limit: MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. 38.89% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Cobalt Analysis Run 12/20/2022 3:27 PM View: Original Wells

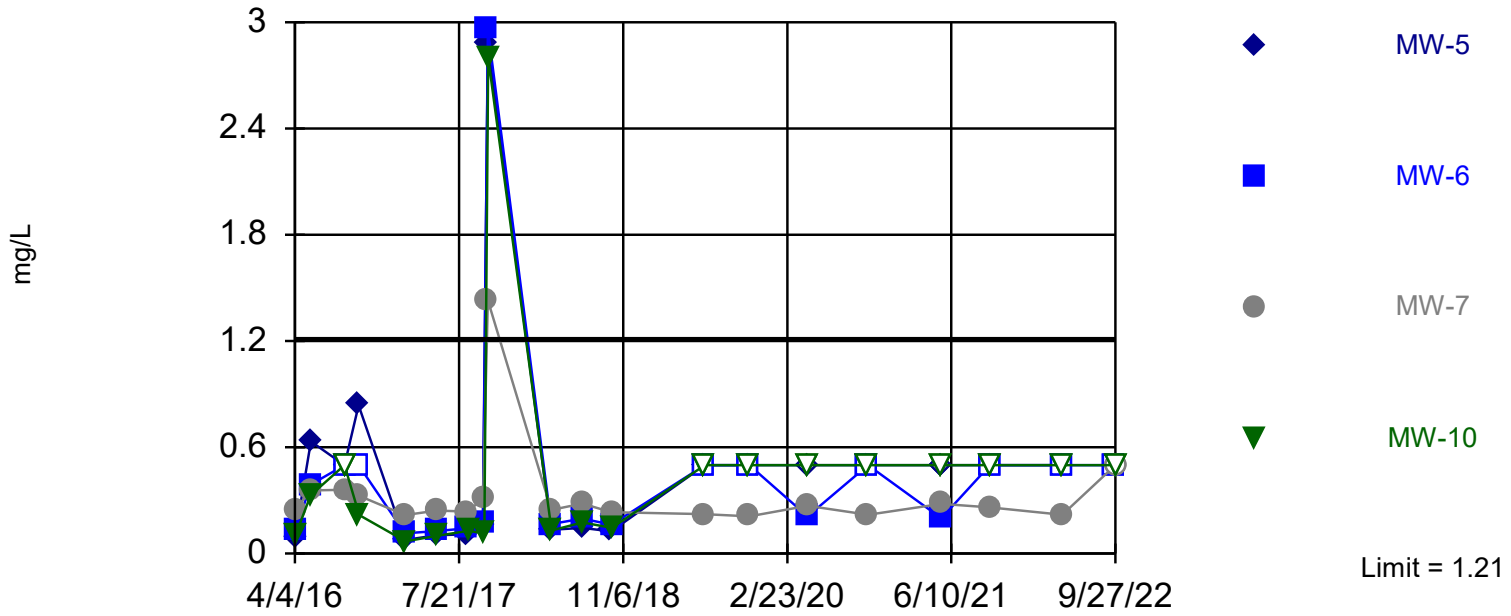
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 20 background values. 5% NDs. Report alpha = 0.1667. Individual comparison alpha = 0.04456. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Fluoride Analysis Run 12/20/2022 3:27 PM View: Original Wells

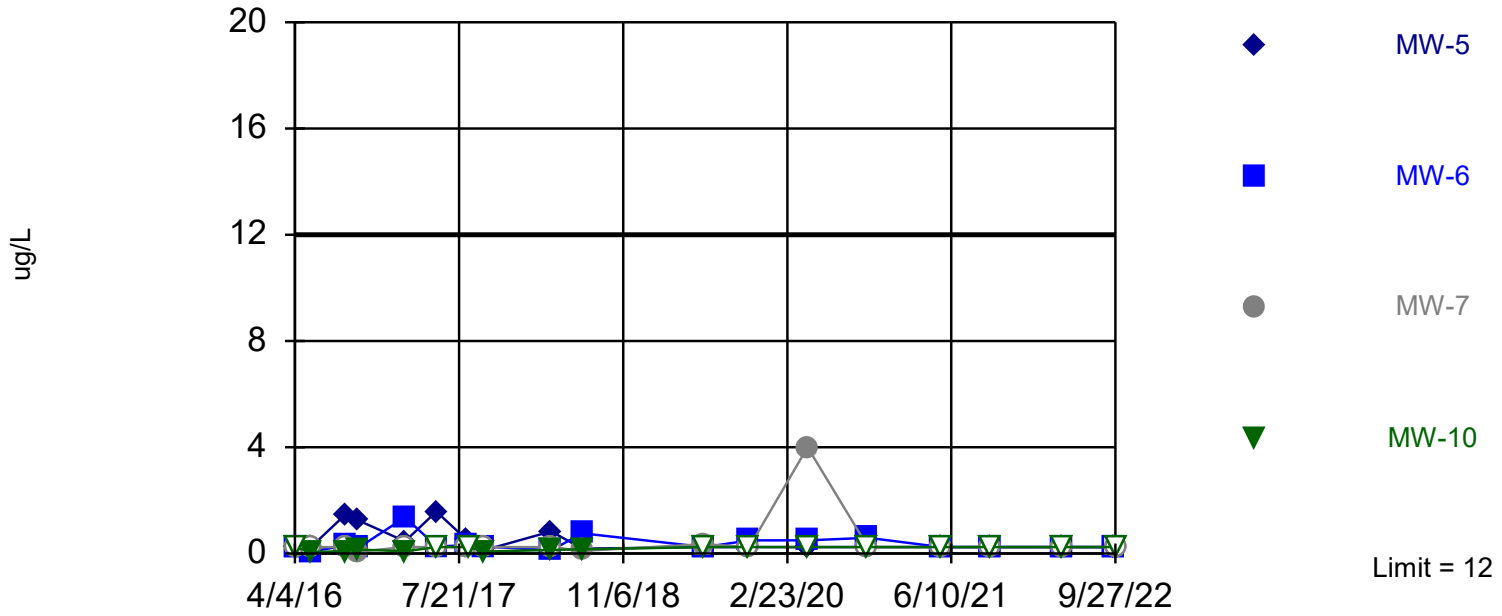
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 66.67% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Lead Analysis Run 12/20/2022 3:27 PM View: Original Wells

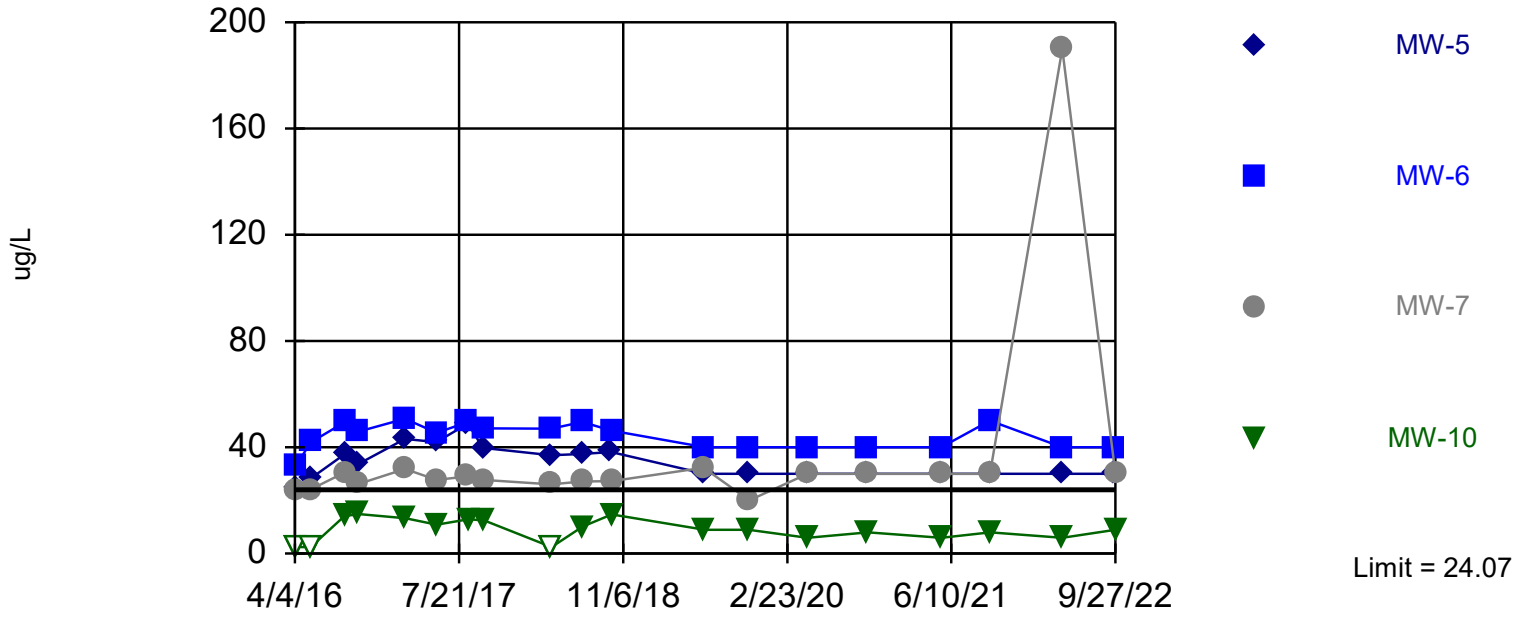
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Sanitas™ v.9.6.36 Software licensed to Burns & McDonnell. EPA
Hollow symbols indicate censored values.

Exceeds Limit: MW-5, MW-6, MW-7

Prediction Limit

Interwell Parametric



Background Data Summary (after Cohen`s Adjustment): Mean=10.03, Std. Dev.=5.359, n=19, 21.05% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9164, critical = 0.901. Report alpha = 0.0394. Individual comparison alpha = 0.01. 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: Lithium Analysis Run 12/20/2022 3:27 PM View: Original Wells

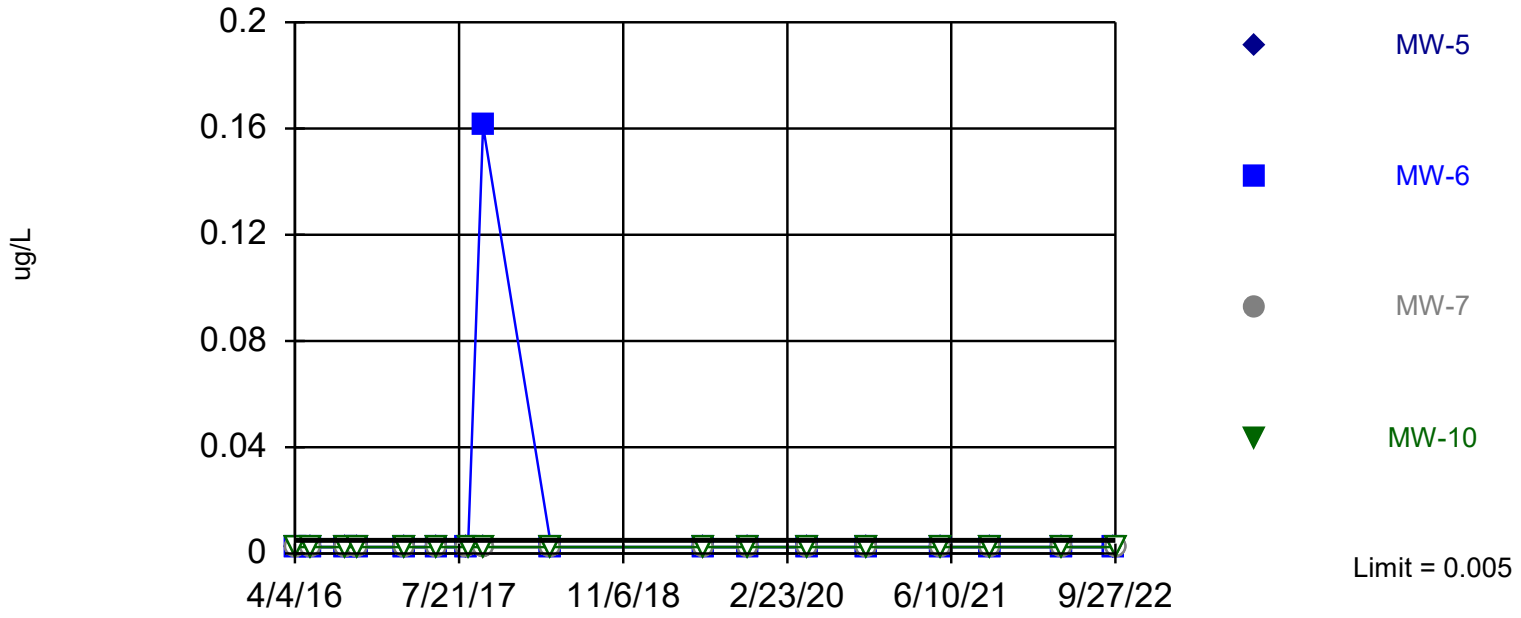
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 17) were censored; limit is most recent reporting limit. Report alpha = 0.1905. Individual comparison alpha = 0.05146. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Mercury Analysis Run 12/20/2022 3:27 PM View: Original Wells

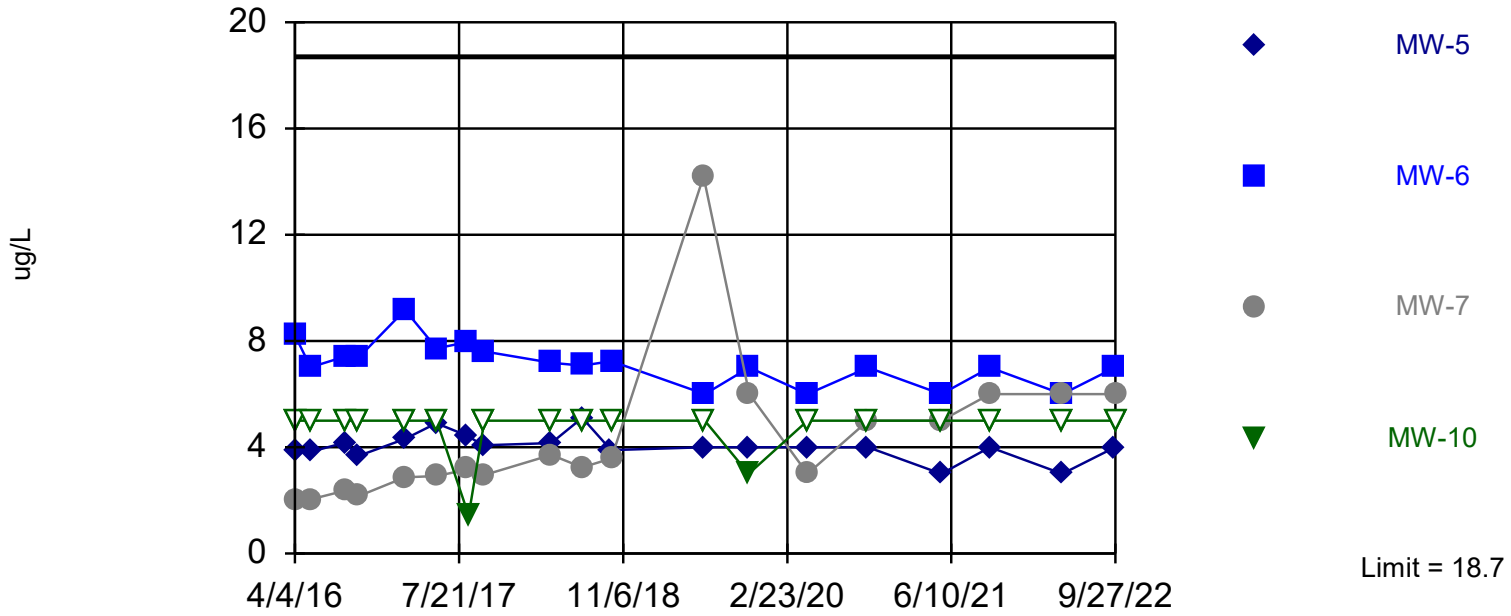
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. Report alpha = 0.1739. Individual comparison alpha = 0.04664. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Molybdenum Analysis Run 12/20/2022 3:27 PM View: Original Wells

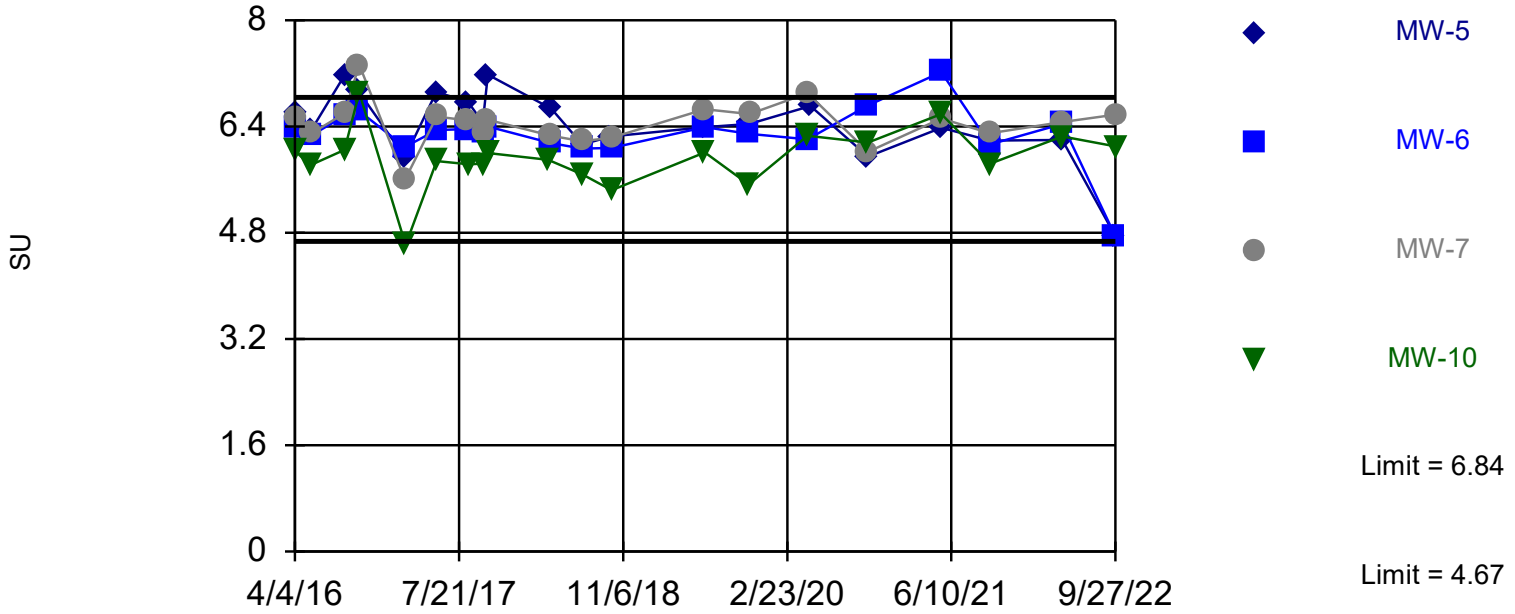
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Within Limits

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limits are highest and lowest of 20 background values. Report alpha = 0.3333. Individual comparison alpha = 0.08911. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: pH [Field] Analysis Run 12/20/2022 3:27 PM View: Original Wells

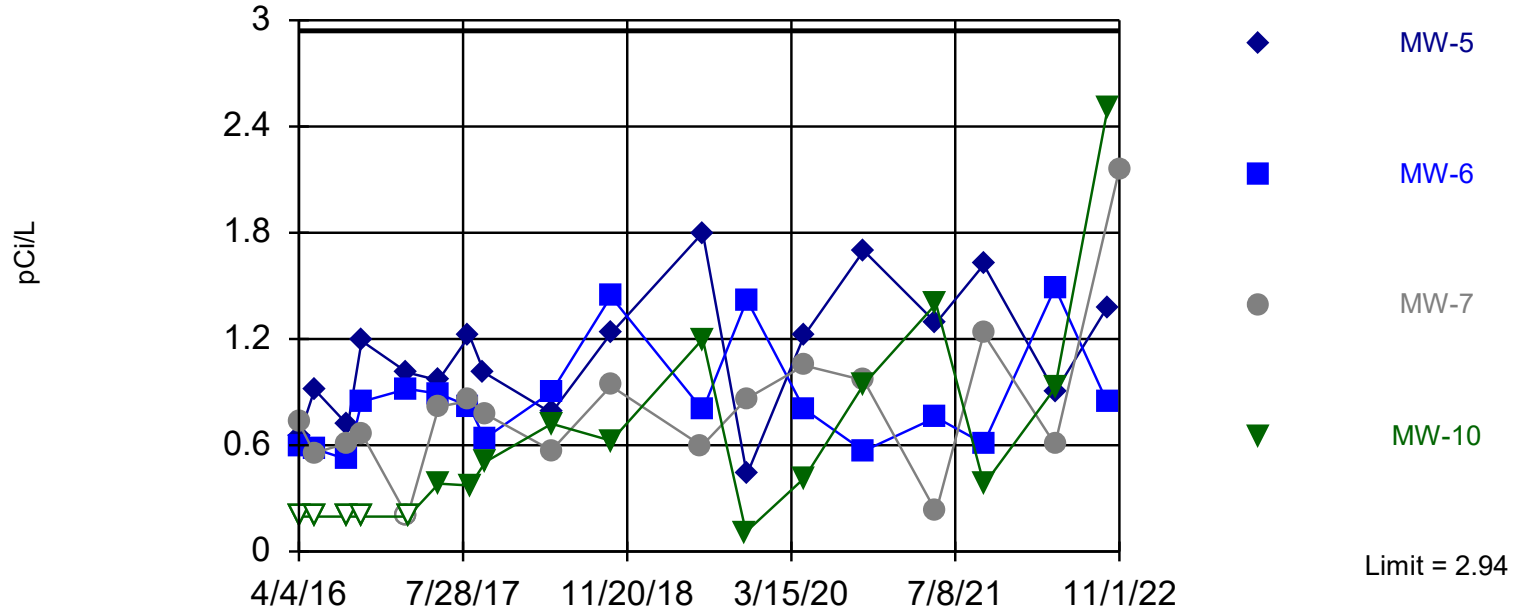
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 18 background values. Report alpha = 0.1818. Individual comparison alpha = 0.04893. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Radium 226 + 228 Analysis Run 12/20/2022 3:27 PM View: Original Wells

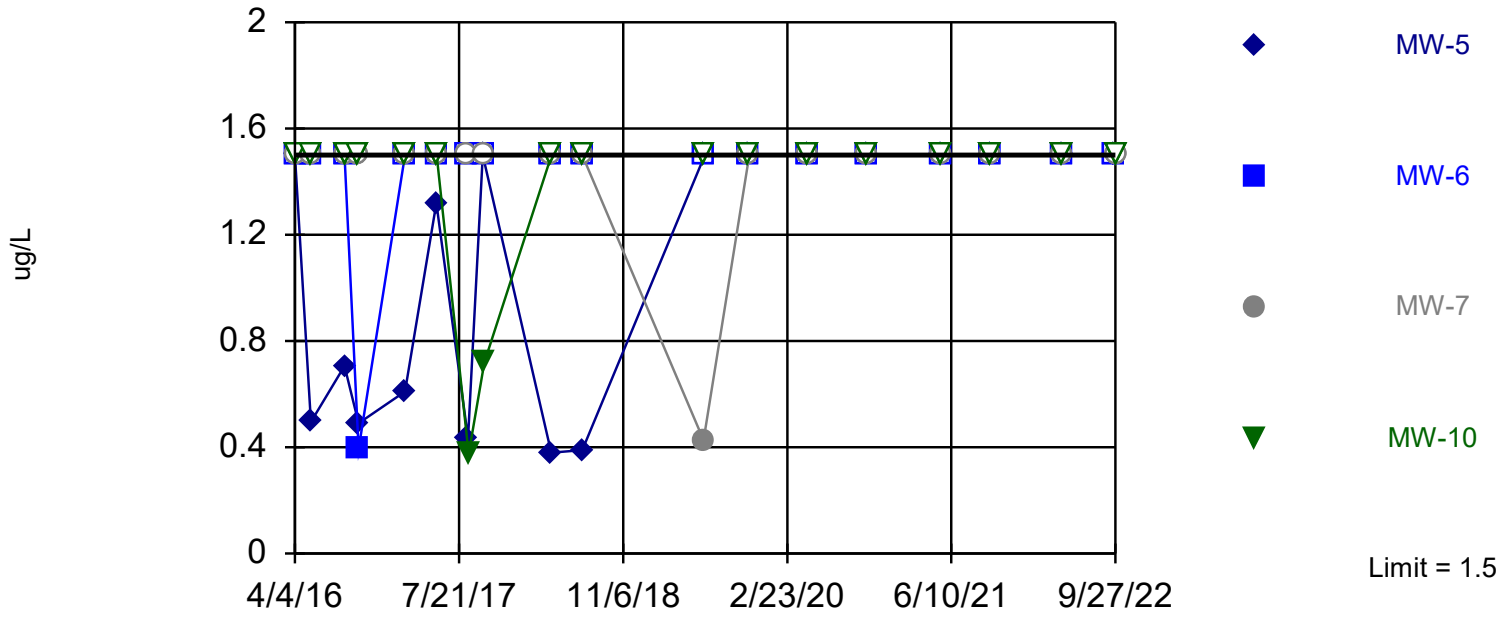
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 88.89% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

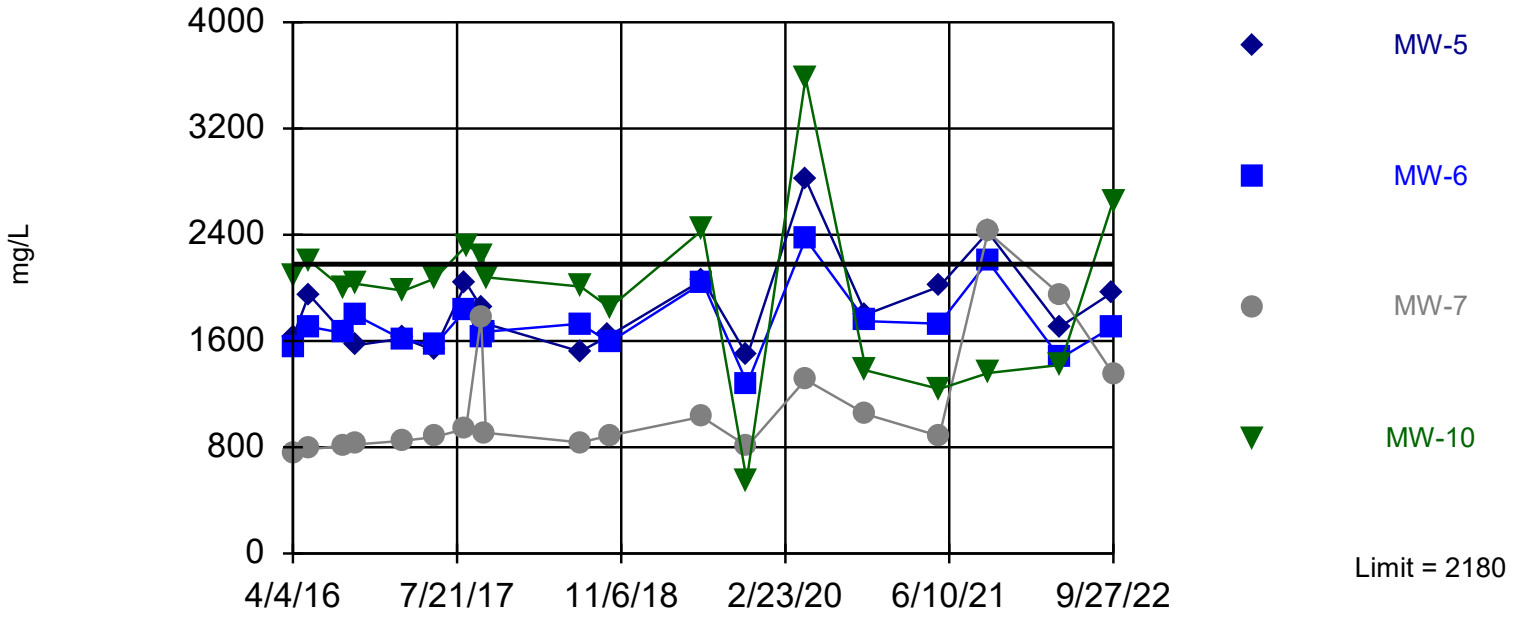
Constituent: Selenium Analysis Run 12/20/2022 3:27 PM View: Original Wells

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

Exceeds Limit: MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. Report alpha = 0.1739. Individual comparison alpha = 0.04664. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Sulfate Analysis Run 12/20/2022 3:27 PM View: Original Wells

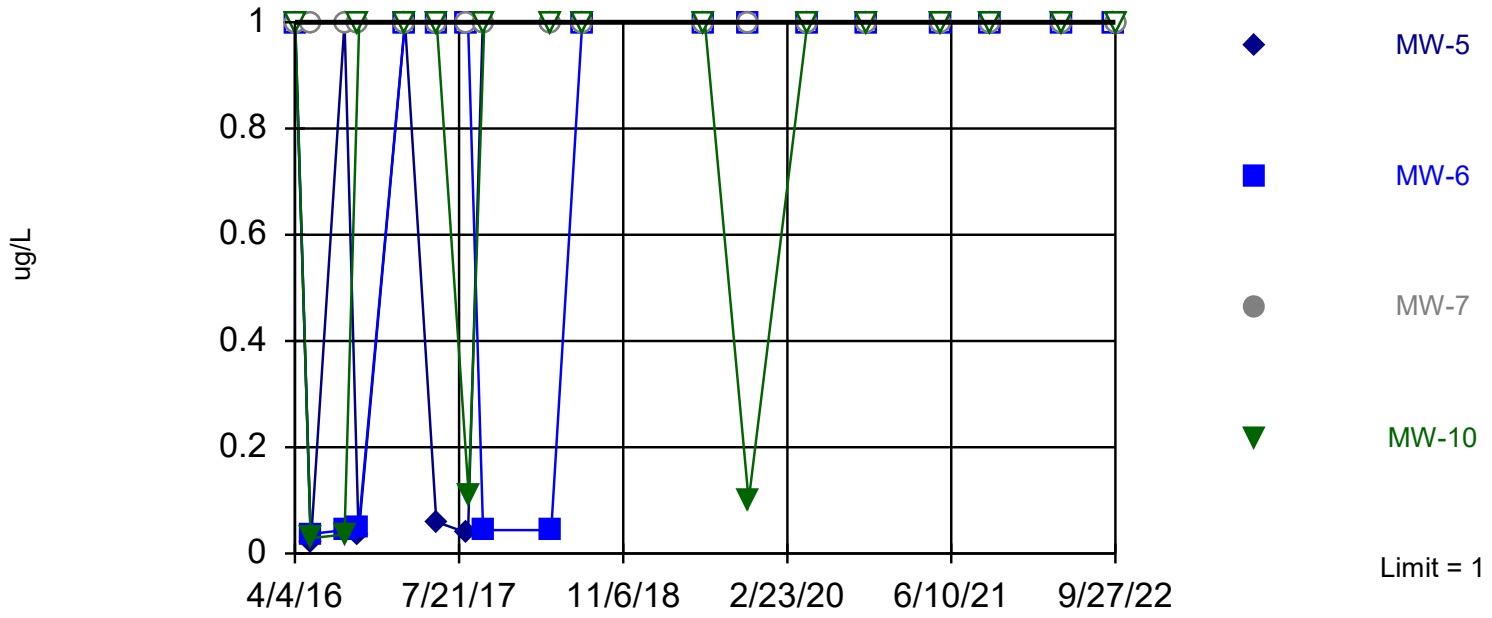
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 83.33% NDs. Report alpha = 0.1818. Individual comparison alpha = 0.04893. 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. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Thallium Analysis Run 12/20/2022 3:27 PM View: Original Wells

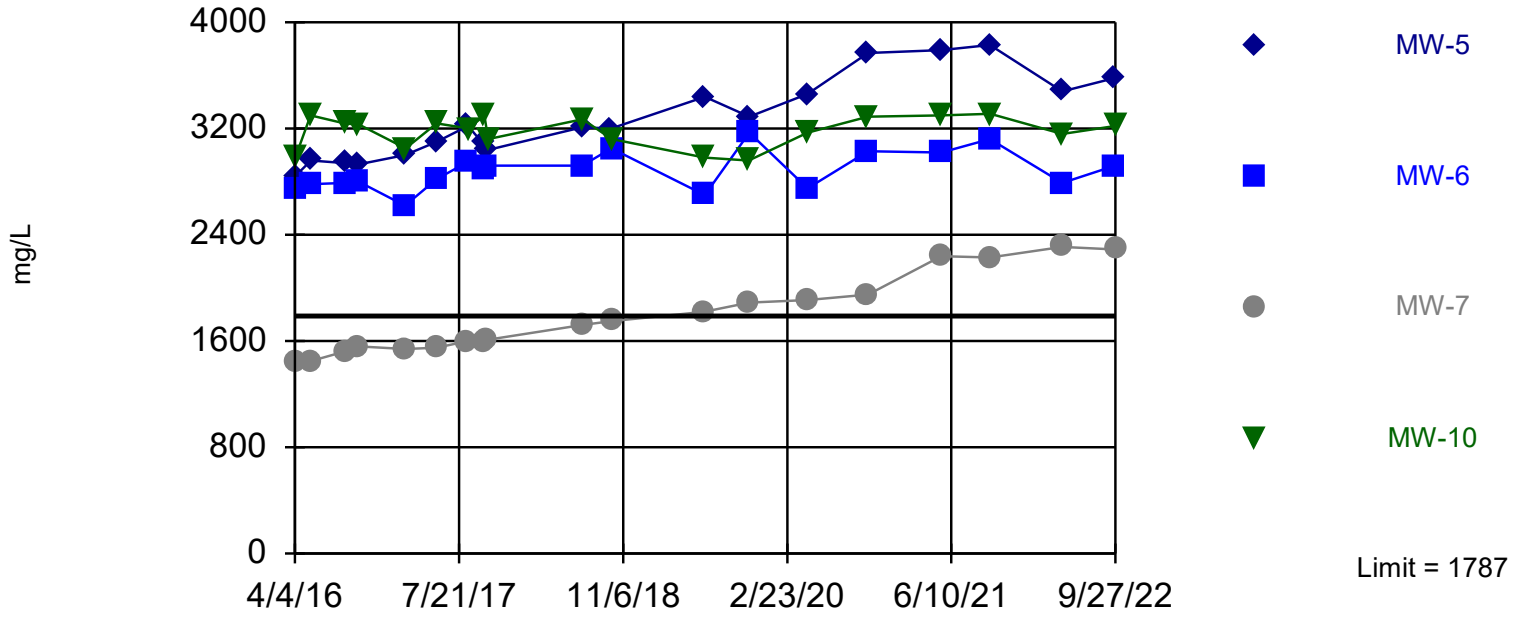
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Exceeds Limit: MW-5, MW-6, MW-7, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1567, Std. Dev.=84.05, n=19. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9777, critical = 0.901. Report alpha = 0.0394. Individual comparison alpha = 0.01. 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: Total Dissolved Solids Analysis Run 12/20/2022 3:27 PM View: Original Wells

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

CCR Wells Confidence Interval (95%)

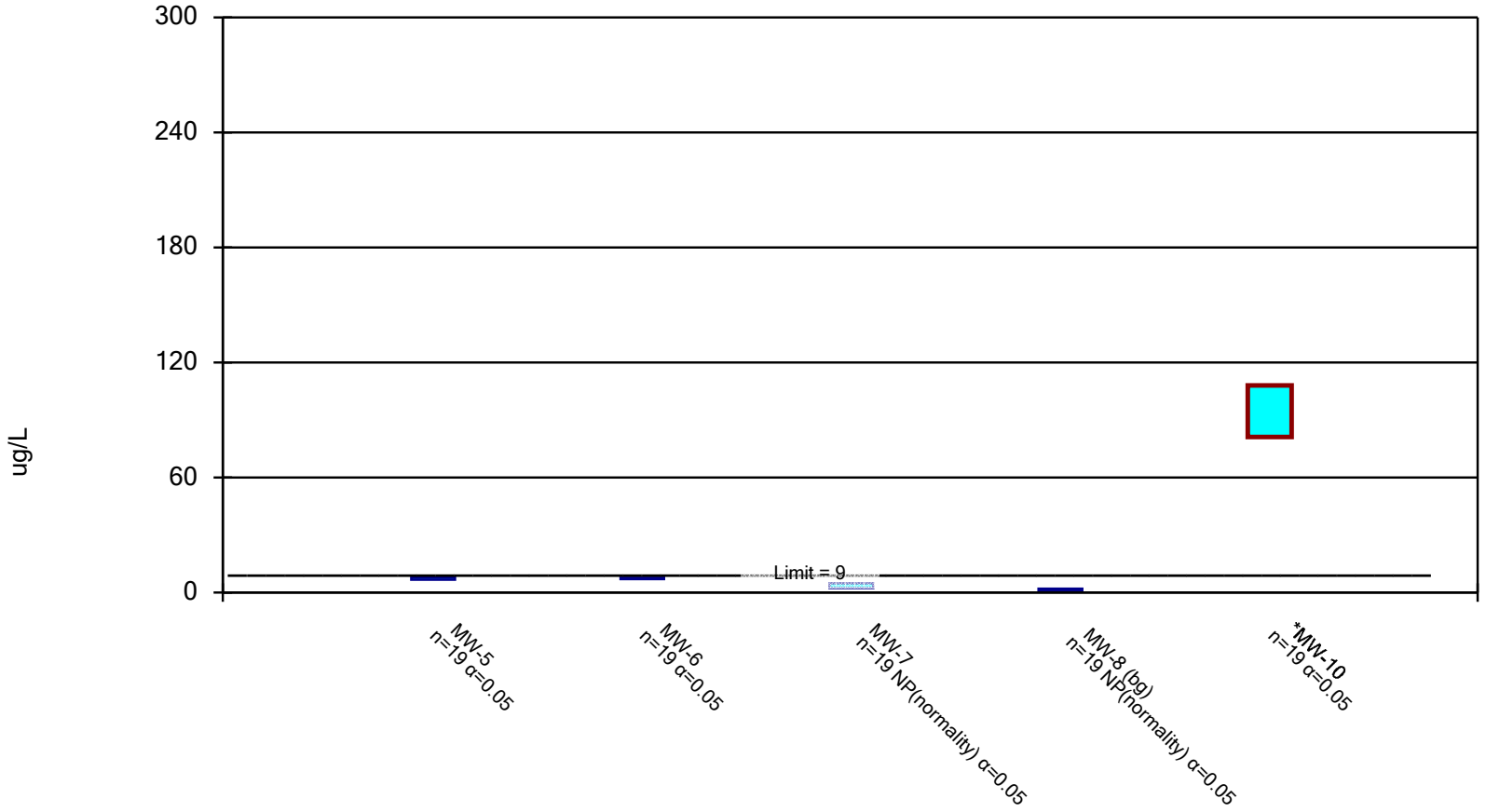
Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2 Printed 12/20/2022, 3:32 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt (ug/L)	MW-5	7.924	6.761	9	No	19	0	No	0.05	Param.
Cobalt (ug/L)	MW-6	7.733	6.943	9	No	19	0	No	0.05	Param.
Cobalt (ug/L)	MW-7	4.83	2.36	9	No	19	31.58	No	0.05	NP (normality)
Cobalt (ug/L)	MW-8 (bg)	2	1.1	9	No	19	36.84	No	0.05	NP (normality)
Cobalt (ug/L)	**MW-10**	**108.1**	**81.21**	**9**	**Yes**	**19**	**0**	**No**	**0.05**	**Param.**
Lithium (ug/L)	MW-5	36.73	31.74	40	No	19	0	No	0.05	Param.
Lithium (ug/L)	MW-6	47.2	40	40	No	19	0	No	0.05	NP (normality)
Lithium (ug/L)	MW-7	30	27.1	40	No	19	0	No	0.05	NP (normality)
Lithium (ug/L)	MW-8 (bg)	12.16	7.9	40	No	19	21.05	No	0.05	Param.
Lithium (ug/L)	MW-10	10.7	7.527	40	No	19	15.79	No	0.05	Param.

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Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Normality Test: Shapiro Wilk, alpha based on n.



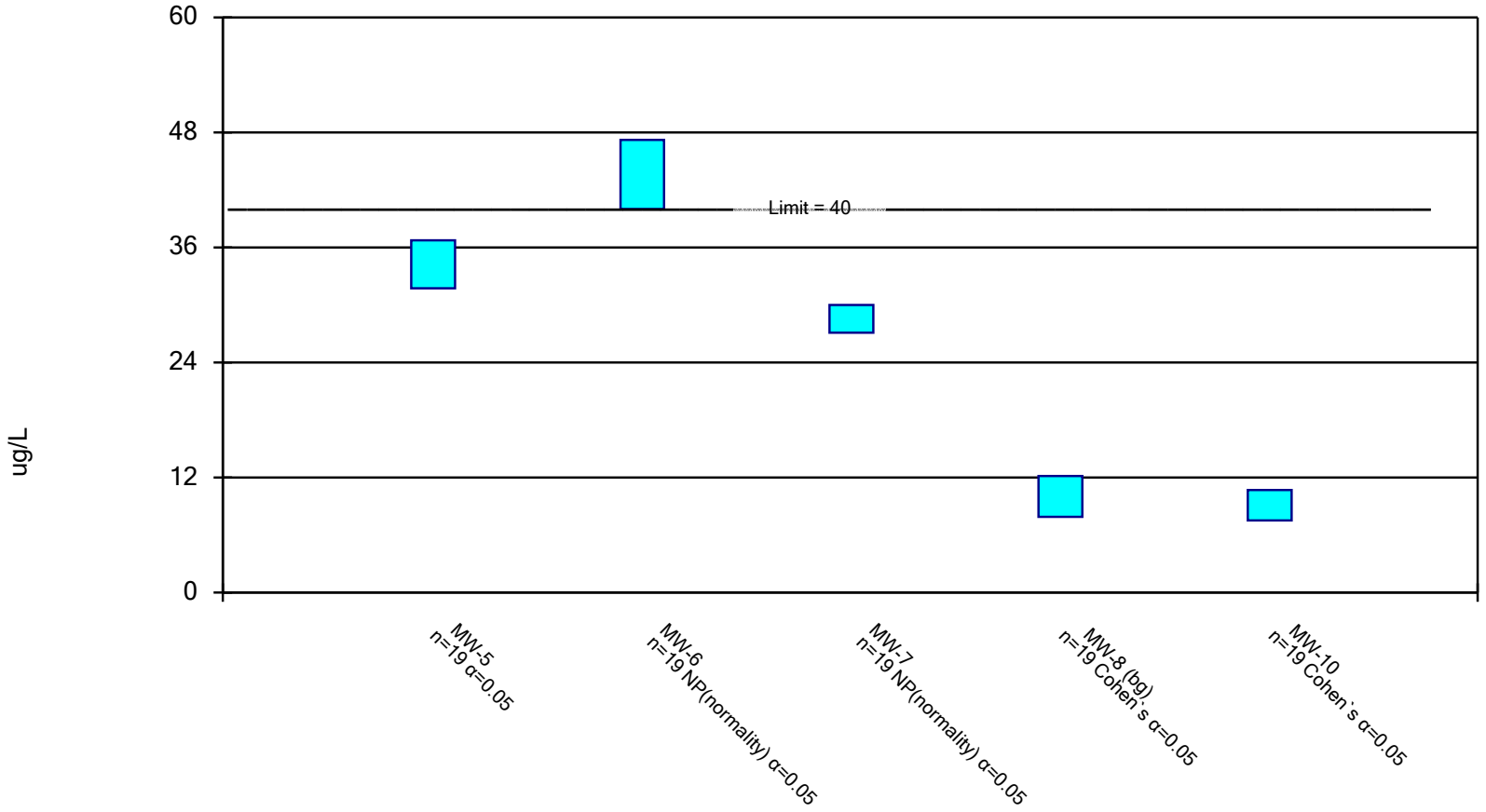
Constituent: Cobalt Analysis Run 12/20/2022 3:32 PM View: Original Wells - SSI

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2

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Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 12/20/2022 3:32 PM View: Original Wells - SSI

Big Rivers Electric Corporation Client: BREC Data: BREC_GW_v2



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