

BIG RIVERS ELECTRIC CORPORATION  
**2023 ANNUAL GROUNDWATER  
MONITORING AND CORRECTIVE  
ACTION REPORT FOR THE FEDERAL  
COAL COMBUSTION RESIDUALS RULE –  
SEBREE STATION**

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BIG RIVERS ELECTRIC CORPORATION SEBREE GENERATING STATION  
GREEN LANDFILL AND SURFACE IMPOUNDMENT

PROJECT NO. 159154

JANUARY 26, 2024

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## List of Abbreviations

Abbreviation	Term/Phrase/Name
ACM	Assessment of Corrective Measures
BREC	Big Rivers Electric Corporation
CCR	Coal Combustion Residuals
CCR Rule	<i>Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals (CCR) from Electric Utilities; Final Rule</i> , dated April 17, 2015, amended July 30, 2018, and on September 28, 2020
CFR	Code of Federal Regulations
GWPS	groundwater protection standard
HMP&L	Reid/Henderson Municipal Power and Light
KDWM	Kentucky Department for Environmental Protection, Division of Waste Management
LCL	lower confidence limit
Pace	Pace Analytical Services, LLC
Report	<i>2023 Annual Groundwater Monitoring and Corrective Action Report</i>
Station/Site	Sebree Generating Station located in Robards, Kentucky
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
USEPA	United States Environmental Protection Agency



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## Executive Summary

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This 2023 Annual Groundwater Monitoring and Corrective Action Report (Report) summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2023, at the Big Rivers Electric Corporation (BREC) Sebree Generating Station (Station or Site) as required by 40 Code of Federal Regulations (CFR) §257.90(e) of the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule (CCR Rule). The following two CCR units at the Station are subject to the CCR Rule:

- Green Station Landfill (Webster County); and
- Green Station Surface Impoundment (Webster County)

The 2023 Annual Groundwater Monitoring and Corrective Action Report for the Reid/Henderson Municipal Power and Light (HMP&L) Surface Impoundment (Henderson County) at the Station is provided as a separate submittal.

A Site figure presenting the location of the CCR units is presented as **Figure 1**. The program monitoring networks for each CCR unit, including supporting monitoring wells, are presented as **Figure 2** (Green Landfill) and **Figure 3** (Green Surface Impoundment). Three new characterization monitoring wells (MW-105, MW-106S, and MW-106D) were installed at the Green Landfill during the 2023 reporting period. No monitoring wells were installed, modified, or abandoned at the Green Surface Impoundment during the 2023 reporting period.

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Green Landfill would require initiation of assessment monitoring under the CCR Rule, as the laboratory analytical results from these events indicated that most of the Appendix III constituents had statistically significant increases (SSIs) over background as noted below.

- Appendix III parameters calcium, chloride, sulfate, and total dissolved solids (TDS) at the Green Landfill.

On February 5, 2018, BREC posted on their publicly accessible CCR reporting website a formal notification that the Green Landfill would transition from baseline detection to assessment monitoring program. At both the start and end of the 2023 annual reporting period, the Green Landfill was operating under the assessment monitoring program in 40 CFR §257.95.

Statistical evaluation of groundwater analytical data collected during assessment monitoring at the Green Landfill indicated that Appendix IV constituents were detected in downgradient monitoring wells at SSIs over background in 2018 through 2023 as detailed below.

Appendix IV Constituents at an SSI	Green Landfill
Arsenic	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> <li>• June and November 2023</li> </ul>
Barium	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> <li>• June and November 2023</li> </ul>
Cadmium	<ul style="list-style-type: none"> <li>• April 2021</li> </ul>
Cobalt	<ul style="list-style-type: none"> <li>• September 2020</li> </ul>
Chromium	none
Fluoride	none
Lithium	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> <li>• June and November 2023</li> </ul>
Mercury	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April 2021</li> <li>• December 2022</li> <li>• June and November 2023</li> </ul>
Molybdenum	<ul style="list-style-type: none"> <li>• April and September 2021</li> <li>• April 2022</li> <li>• June and November 2023</li> </ul>
Radium 226+228 (combined)	<ul style="list-style-type: none"> <li>• April 2022</li> </ul>
Selenium	<ul style="list-style-type: none"> <li>• April 2020</li> <li>• April 2021</li> <li>• April 2022</li> <li>• June 2023</li> </ul>

Per CCR rule requirements, groundwater protection standards (GWPSs) for each Appendix IV constituent were developed and the data were tested for whether the concentrations

represented statistically significant levels (SSLs) above their respective GWPSs. SSLs identified in annual reporting periods from 2018 through 2023 are as follows:

Appendix IV Constituent at an SSL above GWPS	Green Landfill	Reporting Period
Arsenic	MW-2	2022 and 2023
Lithium	MW-3A, MW-4, MW-5, and MW-6	2018, 2019, 2020, 2021, 2022, and 2023

On December 6, 2018, and October 3, 2022, BREC posted on their publicly accessible CCR reporting website a formal notification that lithium (2018) and arsenic (2022) had been detected at SSLs above the established GWPS for the Green Landfill. In June 2019, BREC finalized an *Assessment of Corrective Measures (ACM)* for the Green Landfill to identify applicable remedial technologies to address impacts in groundwater pursuant to Title 40 CFR §257.96 (AECOM, 2019b). Reports summarizing the results of the Green Landfill ACM were completed and placed in the BREC operating record on June 13, 2019. The ACM report was posted to BREC’s publicly accessible CCR reporting website on July 11, 2019. Semi-annual progress on the selection of remedy process for the Green Landfill was reported in December 2019 (AECOM, 2019c) and June 2020 (AECOM, 2020b).

A public meeting open to interested and affected parties was held on July 16, 2020, to discuss the results of the ACM for Green Landfill. No public input influencing the remedy for the unit was received during the meeting. On November 18, 2020, BREC finalized a *Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report, Green Landfill, Sebree Station, Webster County, Kentucky* (AECOM, 2020c), thereby selecting the remedy for groundwater and non-groundwater impacts at the CCR unit in accordance with 40 CFR §257.97.

Construction of source control measures to address groundwater impacts at Green Landfill were initiated in November 2020. These source control measures consisted of:

1. Design and construction of perimeter Toe Drain System and additional seepage controls to address leachate outbreaks;
2. Design, permitting, and construction of supplemental seepage controls at River Seep - 07; and
3. Sediment removal from the South Sediment Basin.

Construction of these additional source control measures around the perimeter of the Green Landfill was completed in the fourth quarter of 2021. Each of these remedies is expected to benefit groundwater corrective action as a whole and will be further evaluated in 2024 and beyond for alignment with the corrective action objectives through performance monitoring.

For the Green Surface Impoundment, the results of the statistical evaluation for Appendix III parameters collected during the baseline groundwater monitoring period in 2016 and 2017 initiated semi-annual detection monitoring by BREC in 2018. At both the start and end of the

2023 annual reporting period, the Green Surface Impoundment was operating under the detection monitoring program in accordance with 40 CFR §257.94. Assessment monitoring has not been triggered for the Green Surface Impoundment.

Other activities and conditions for the 2023 annual reporting period include:

- Semi-annual assessment groundwater monitoring events were performed at Green Landfill in June and November 2023;
- Semi-annual detection groundwater monitoring events were performed at Green Surface Impoundment in June and November 2023;
- Installation of three new characterization monitoring wells (MW-105, MW-106S, and MW-106D) at the Green Landfill;
- No program transitions (detection to assessment or vice versa) were triggered; and
- The Green Surface Impoundment began closure activities which are scheduled to be finalized by the end of the first quarter of 2024.

No monitoring well installation, repair, or decommissioning was performed at the Green Surface Impoundment. No program transitions (detection to assessment or vice versa) were triggered at the Green Landfill and Green Surface Impoundment.

Anticipated activities for the next 2024 annual reporting period include:

- Completion of two semi-annual assessment groundwater monitoring events at the Green Landfill;
- Completion of two semi-annual detection groundwater monitoring events at the Green Surface Impoundment (unless an SSI triggers assessment monitoring);
- Continued closure activities at the Green Surface Impoundment;
- Characterization of groundwater for arsenic at the Green Landfill due to SSL over the GWPS; and
- Remedy evaluation at Green Landfill.

This Report for BREC was prepared to address the requirements of CFR 40 CFR 257.90(e) of the USEPA CCR rule, which requires the contents listed below with the appropriate report section reference identified in **bold type** for the corresponding content:

1. A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit (see **Figure 2** and **Figure 3**);
2. Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken. **Three new characterization monitoring wells (MW-105, MW-106S, and MW-106D) were installed at the Green Landfill in 2023 (referenced in Section 2.2). No monitoring wells were installed or decommissioned at the Green Surface Impoundment in 2023;**
3. In addition to all the monitoring data obtained under Section 257.90 through 257.98, a summary including the number of groundwater samples that were collected for

analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs (**referenced in Section 2.1**);

4. A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at an SSI over background levels) (**presented in Section 3.3**); and
5. Other information required to be included in the annual report as specified in Section 257.90 through 257.98 (i.e., groundwater monitoring results and various demonstrations regarding alternative monitoring frequency, alternative sources, and extension of schedule for ACMs) (**no other information was developed or reported in 2023 as noted in Section 2**).

# 1.0 INTRODUCTION

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At the request of Big Rivers Electric Corporation (BREC), Burns & McDonnell prepared this 2023 Annual Groundwater Monitoring and Corrective Action Report (Report) for the BREC Sebree Generating Station (Station or Site), located in Robards, Kentucky within both Henderson and Webster Counties, Kentucky. This Report was prepared in accordance with §257.90(e) of 40 Code of Federal Regulations (CFR) Part 257 and 261 of the United States Environmental Protection Agency (USEPA) Coal-Combustion Residuals (CCR) Rule (CCR Rule) to document the status of the groundwater monitoring and corrective action program at the CCR units, summarize key actions completed, describe any problems encountered, discuss any actions to resolve the problems, and provide key activities for the upcoming year. 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 is the seventh annual report for the CCR units and summarizes activities performed in 2023 related to the CCR Rule groundwater monitoring program at the following CCR units:

- Green Station Landfill (Webster County); and
- Green Station Surface Impoundment (Webster County)

The 2023 Annual Groundwater Monitoring and Corrective Action Report for the Reid/Henderson Municipal Power and Light (HMP&L) Surface Impoundment (Henderson County) at the Station is provided as a separate submittal.

As stated in the previous 2016-2022 Annual Groundwater Monitoring and Corrective Action Reports (AECOM, 2018; AECOM, 2019a; AECOM, 2020a; AECOM, 2021; AECOM, 2022; and Burns & McDonnell, 2023b), statistical results of the baseline groundwater data indicate that the Green Landfill would require initiation of assessment monitoring under the CCR Rule, as the laboratory analytical results from these events indicated that most of the Appendix III constituents had statistically significant increases (SSIs) over background as noted below.

- Appendix III parameters calcium, chloride, sulfate, and total dissolved solids (TDS) at the Green Landfill.

On February 5, 2018, BREC posted on their publicly accessible CCR reporting website a formal notification that the Green Landfill would enter assessment Monitoring Program, fulfilling the requirement of 40 CFR §257.107(h)(4).

Based upon the statistical evaluation of Appendix III parameters collected during the baseline period at the Green Surface Impoundment, BREC initiated semi-annual detection monitoring in 2018.

The following sections present a background summary of the Site, a discussion of field activities performed, a summary of laboratory results, statistical evaluation findings, and conclusions regarding groundwater conditions in the aquifer system subject to monitoring under the CCR Rule.



## 1.1 Site Description

BREC owns and operates the Station, which is a former coal-fired power generating facility located on the Green River northeast of Sebree, Kentucky. The Station is composed of Green Station and HMP&L Station. The Station is bounded by Interstate 69 to the west and the Green River to the east (see **Figure 1**). Reid Unit 1 began commercial operation in 1966 and was retired on September 30, 2020. HMP&L Station 2, Units 1 and 2 began commercial operation in 1973 and 1974, respectively. Both HMP&L units were retired as of February 1, 2019. Green Station Units 1 and 2 began commercial operation in 1979 and 1981, respectively. Both Green units were converted to natural gas-fired boilers in the second quarter of 2022.

Three disposal CCR units at the Station are regulated under the CCR Rule: Green Landfill, Green Surface Impoundment, and the Reid/HMP&L Surface Impoundment. This Report is for the Green Landfill and Green Surface Impoundment with each CCR unit discussed in more detail below.

### 1.1.1 Green Landfill

The Green Landfill is located directly south of the Station, situated south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that previously received special wastes generated by burning coal (CCRs) from Green Station, and formerly Reid Station Unit 1, and HMP&L Station 2 Units 1 and 2. The landfill began receiving CCR wastes in 1980 and currently receives CCR material generated from Green Surface Impoundment closure activities, which began in 2022 and are scheduled to be finalized by the end of the first quarter of 2024. The current Green Landfill footprint is approximately 170 acres.

As stated in the published CCR monitoring well network certification for this CCR unit (Associated Engineering Inc., June 2016a), the original ground surface within the landfill footprint was irregular and the dominant features were small stream valleys draining towards the Green River, which is located just east of the landfill; and towards Groves Creek, which is located just south of the landfill. There was also historic oil and gas production at and in the immediate vicinity of the Green Landfill. A review of the records from the Kentucky Geological Survey showed that at or immediately adjacent to the Site, there were several dry oil/gas exploration holes, oil production wells, one gas production well, and one secondary recovery injection well. There were also former brine ponds at the Site. Most of these wells were abandoned in accordance with applicable regulations by BREC in 1997 and 1998. The last existing oil well was decommissioned in 2019.

### 1.1.2 Green Surface Impoundment

The Green Surface Impoundment is located directly south of the Station and situated north of the Green Landfill. The Green Surface Impoundment has been in place for more than 40 years for the placement of CCR material. In 2022, this CCR unit began closure activities which are scheduled to be finalized by the end of the first quarter of 2024. The immediate watershed that drains to the CCR unit, and in which the CCR unit is located, is unnamed and 54.13 acres in size. The unnamed watershed discharges from the CCR surface impoundment outflow structure and is routed and monitored under a Kentucky Pollution Discharge Elimination System permit, to the Green River.

As stated in the CCR monitoring well network certification for this CCR unit (Associated Engineering Inc., June 2016b), the Green Surface Impoundment is a combined incised/dike earthen embankment structure. It is diked on the west, south and east sides, while the north side is incised. The south dike has the greatest height, reaching approximately 20 feet. The original ground surface within the pond footprint was irregular and the predominant features were small stream valleys draining eastward toward the Green River.

## 1.2 Green Landfill CCR Program Monitoring Well System

### 1.2.1 Operating Permit Compliance Monitoring Wells

Prior to implementation of the CCR Rule, a groundwater monitoring well network was already present at the Green Landfill 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 Green Landfill and meet the CCR Rule requirements that a minimum of one (1) upgradient and three (3) downgradient monitoring wells must be located at the waste boundary of the (active) CCR unit, or as close as practicable.

Under the requirements stated in the operating permit, six (6) monitoring wells (MW-1, MW-2, MW-3A, MW-4, MW-5, and MW-6) were installed adjacent to the Green Landfill to determine the general direction of groundwater movement and to monitor groundwater at the CCR unit. Monitoring Well MW-1 is located northwest of the landfill and is considered upgradient and represents the background well. Monitoring Wells MW-2, MW 3A, MW-4, MW-5, and MW-6; located respectively, northeast, east, southeast, south, and southwest are considered downgradient. As-built specifics of each monitoring well installation are summarized in **Table 1**. The locations of the groundwater monitoring wells are shown on **Figure 2**. Each monitoring well has a dedicated bladder pump and tubing system installed for groundwater sampling purposes.

Details about the monitoring network are presented in the *Monitoring Well Completion Report, Special Waste Landfill Facility, R.D. Green Station, Webster County, Kentucky* (FMSM Engineers, 1997).

No new CCR Rule compliance monitoring wells were installed in 2023.

### 1.2.2 Characterization Monitoring Wells

To address the requirements of 40 CFR §257.95(g)(1), one (1) characterization monitoring well (MW-104) was installed in February 2019 (lithium statistically significant levels [SSLs] > groundwater protection standards [GWPSs]) and three (3) characterization monitoring wells (MW-105, MW-106S, and MW-106D) were installed in 2023 (arsenic SSL > GWPS; see **Section 2.2**) to characterize groundwater at the locations indicated on **Figure 2**. As-built specifics of each characterization monitoring well installation are summarized on **Table 1**. Each characterization monitoring well has a dedicated bladder pump and tubing system installed for groundwater sampling purposes.

These characterization monitoring wells, located at a downgradient position east of the CCR 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.

## 1.3 Green Surface Impoundment CRR Rule Program Monitoring Well System

Prior to implementation of the CCR Rule, three temporary piezometers (P-10, P-11, and P-12) were installed adjacent to, and respectively; northwest, southwest, and northeast of the Green Surface Impoundment to determine the general direction of groundwater movement. Measured static water levels, from the highest to lowest elevation were observed in P-10 (highest), P-11, and P-12 (lowest). A hydraulic gradient was calculated using this data indicating the apparent direction of groundwater movement is generally from northwest to southeast. This groundwater gradient characterization and the ability to locate monitoring wells specific to the CCR unit justified the placement of the minimum of one (1) upgradient and three (3) downgradient monitoring wells in accordance with the CCR Rule. An upgradient monitoring well (MW-11) was installed adjacent to, and northwest of the CCR unit. Three downgradient monitoring wells (MW-12, MW-13, and MW-14) were installed adjacent to, and respectively; south-southeast, southeast, and east-northeast of the CCR unit. As-built specifics of each well installation are summarized in **Table 2**. The locations of the groundwater monitoring wells are shown on **Figure 3**. Each monitoring well has a dedicated bladder pump system and tubing installed for groundwater sampling purposes.

The stratigraphic interval considered as the most prominent water transmitting zone within and adjacent to the Green Surface Impoundment is material identified as the Upper Sandstone Member (Sebree sandstone) of the Carbondale Formation. The United States Geological Survey Geologic Map of the Robards Quadrangle (Fairer, 1973) describes the Sebree sandstone sequence as “Siltstone, sandstone, shale and coal: Siltstone, light- to medium-gray, micaceous, thin-bedded, locally calcareous. Sandstone, light- to medium-gray, grayish- and yellowish-brown, fine- to medium-grained slightly micaceous, thin-bedded to massive; locally fills channels.” For purposes of compliance with the CCR Rule groundwater monitoring requirements; this sequence, and in particular the sandstone intervals, is considered to be the uppermost aquifer underlying the Green Surface Impoundment.

Details about the monitoring network are presented in the Assessment of Groundwater Gradients in Vicinities of Green and Reid/HMPL CCR Impoundments dated September 25, 2015, maintained within the operating record at the Station. No changes were made to the Program Monitoring Well System in 2023.

Due to the lack of Appendix IV constituents with SSLs above their respective GWPSs for the CCR unit, no characterization monitoring wells are required for the Green Surface Impoundment.

## 1.4 Summary of Groundwater Monitoring Programs

### 1.4.1 Green Landfill Groundwater Monitoring Program

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Green Landfill would require initiation of assessment monitoring under the CCR Rule, as the laboratory analytical results from these events indicated that most of the Appendix III constituents had SSIs over background as noted below.

- Appendix III parameters calcium, chloride, sulfate, and TDS.

On February 5, 2018, BREC posted on their publicly accessible CCR reporting website a formal notification that the Green Landfill would transition from baseline detection to assessment monitoring program. Since 2018 the Green Landfill has been operating under the assessment monitoring program in 40 CFR §257.95. Statistical evaluation of previous groundwater analytical data collected during assessment monitoring at the Green Landfill from 2018 through 2022 indicated that Appendix IV constituents were detected in downgradient monitoring wells at SSIs over background as detailed below.

Appendix IV Constituents at an SSI	Green Landfill
Arsenic	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> </ul>
Barium	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> </ul>
Cadmium	<ul style="list-style-type: none"> <li>• April 2021</li> </ul>
Cobalt	<ul style="list-style-type: none"> <li>• September 2020</li> </ul>
Chromium	none
Fluoride	none
Lithium	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April and September 2021</li> <li>• April and December 2022</li> </ul>
Mercury	<ul style="list-style-type: none"> <li>• June and July 2018</li> <li>• April and October 2019</li> <li>• April and September 2020</li> <li>• April 2021</li> <li>• December 2022</li> </ul>
Molybdenum	<ul style="list-style-type: none"> <li>• April and September 2021</li> <li>• April 2022</li> </ul>
Radium 226+228 (combined)	<ul style="list-style-type: none"> <li>• April 2022</li> </ul>
Selenium	<ul style="list-style-type: none"> <li>• April 2020</li> <li>• April 2021</li> <li>• April 2022</li> </ul>

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 previous annual reporting periods from 2018 through 2022 are as follows:

Appendix IV Constituent at an SSL above GWPS	Green Landfill	Reporting Period
Arsenic	MW-2	2022
Lithium	MW-3A, MW-4, MW-5, and MW-6	2018, 2019, 2020, 2021, and 2022

On December 6, 2018, and October 3, 2022, BREC posted on their publicly accessible CCR reporting website formal notification that lithium (2018) and arsenic (2022) had been detected at SSLs above the established GWPS for the Green Landfill. In June 2019 BREC finalized an *Assessment of Corrective Measures (ACM)* for the Green Landfill to identify applicable remedial technologies to address impacts in groundwater pursuant to Title 40 CFR §257.96 (AECOM, 2019b). Reports summarizing the results of the Green Landfill ACM were completed and placed in the BREC operating record on June 13, 2019. The ACM report was posted to BREC’s publicly accessible CCR reporting website on July 11, 2019. Semi-annual progress on the selection of remedy process for the Green Landfill was reported in December 2019 (AECOM, 2019c) and June 2020 (AECOM, 2020b).

A public meeting open to interested and affected parties was held on July 16, 2020, to discuss the results of the ACM for Green Landfill. No public input influencing the remedy for the unit was received during the meeting. On November 18, 2020, BREC finalized a *Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report, Green Landfill, Sebree Station, Webster Counties Kentucky* (AECOM, 2020c), thereby selecting the remedy for groundwater and non-groundwater impacts at the CCR unit in accordance with 40 CFR §257.97.

Construction of source control measures to address groundwater impacts at Green Landfill were initiated in November 2020. These source control measures consisted of:

1. Design and construction of a perimeter Toe Drain System and additional seepage controls to address leachate outbreaks;
2. Design, permitting, and construction of supplemental seepage controls at River Seep - 07; and
3. Sediment removal from the South Sediment Basin.

Construction of these additional source control measures around the perimeter of the Green Landfill was completed in the fourth quarter of 2021. Each of these remedies is expected to benefit groundwater corrective action as a whole and will be further evaluated in 2024 and beyond for alignment with the corrective action objectives through performance monitoring.

## **1.4.2 Green Surface Impoundment Groundwater Monitoring Program**

Based upon the statistical evaluation of Appendix III parameters collected during the baseline period at the Green Surface Impoundment in 2016 through 2017, BREC initiated semi-annual detection monitoring in 2018. At both the start and end of the previous 2022 annual reporting period, the Green Surface Impoundment was operating under the detection monitoring program in 40 CFR §257.94. Assessment monitoring has not been triggered for this unit.

## 2.0 Groundwater Monitoring Activities and Results

The following subsections describe the activities that were performed in 2023 for the two (2) CCR units noted above related to each of their corresponding CCR Groundwater Program Monitoring Well Systems.

### 2.1 Groundwater Sampling Activities

In 2023, the following monitoring events were performed at the Station:

- Green Landfill: Two (2) assessment groundwater monitoring events and two (2) characterization groundwater monitoring events; and
- Green Surface Impoundment: Two (2) detection groundwater monitoring events

The following tables summarize the dates of each semi-annual groundwater sampling event performed by BREC personnel and the monitoring wells included in the sampling events for each CCR unit.

Green Landfill			
Event Type	Sampling Event	Dates	Monitoring Wells Sampled
Assessment	First Half 2023 (Event #21)	June 22-24, 2023	Background (Upgradient) MW-1  Downgradient MW-2, MW-3A, MW-4, MW-5, and MW-6
Characterization	First Half 2023 (Event #10)	June 22-24, 2023	Characterization (Downgradient) MW-104
Characterization	First Half 2023 (Event #1)	June 24, 2023	Characterization (Downgradient) MW-105, MW-106S, and MW-106D
Assessment	Second Half 2023 (Event #22)	November 7-8, 2023	Background (Upgradient) MW-1  Downgradient MW-2, MW-3A, MW-4, MW-5, and MW-6
Characterization	Second Half 2023 (Event #11)	November 7-8, 2023	Characterization (Downgradient) MW-104

Characterization	Second Half 2023 (Event #2)	November 7-8, 2023	Characterization (Downgradient) MW-105, MW-106S, and MW-106D
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Green Surface Impoundment			
Event Type	Sampling Event	Dates	Monitoring Wells Sampled
Detection	First Half 2023 (Event #20)	June 25, 2023	Background (Upgradient) MW-11  Downgradient MW-12, MW-13, MW-14
Detection	Second Half 2023 (Event #21)	November 6, 2023	Background (Upgradient) MW-11  Downgradient MW-12, MW-13, MW-14

Following the November 2023 sampling event at the Green Landfill, a total of 22 monitoring events and 11 characterization monitoring events have been performed since 2016. Following the November 2023 sampling event at the Green Surface Impoundment, a total of 21 monitoring events have been performed since 2016. These previous monitoring events at both CCR units were reported on in the Annual Groundwater Monitoring and Corrective Action Reports in 2016-2017 (AECOM, 2018), 2018 (AECOM, 2019a), 2019 (AECOM, 2020a), 2020 (AECOM, 2021), 2021 (AECOM, 2022), and 2022 (Burns & McDonnell, 2023b).

Prior to groundwater sampling, the depth to groundwater was gauged at each of the monitoring wells by BREC personnel during the 2023 monitoring events. The measured depth to groundwater level data and the calculated groundwater elevations are summarized on **Table 3** (Green Landfill) and **Table 4** (Green Surface Impoundment).

Monitoring wells were sampled by BREC personnel following low flow purging and sampling techniques developed and incorporated into current operating permits which are maintained within the operating record at the Station. No filtration of samples was conducted in either the field or laboratory procedures. Monitoring well sampling forms for each of the groundwater monitoring events for both CCR units are included in **Appendix A** (Green Landfill) and **Appendix B** (Green Surface Impoundment).

Groundwater samples collected during the 2023 sampling events were submitted to Pace Analytical Services, LLC (Pace) in Madisonville, Kentucky for laboratory analysis with radium 226 + 228 (combined) analysis performed by Pace in Greensburg, Pennsylvania. Laboratory analyses were performed in accordance with USEPA-approved methods. Groundwater samples collected at the Green Landfill during assessment and characterization monitoring events were analyzed for Appendix III and Appendix IV parameters, in accordance with 40 CFR §257.95(d)(1). Groundwater samples collected at the Green Surface Impoundment for



the detection monitoring events were analyzed for Appendix III parameters only, in accordance with 40 CFR §257.94(a).

## 2.2 Characterization Monitoring Well Installation Activities

On October 3, 2022, BREC posted on their publicly accessible CCR reporting website formal notification that arsenic had been detected at SSLs above the established GWPSs for the Green Landfill at Monitoring Well MW-2. To address the requirements of 40 CFR §257.95(g)(1), three (3) characterization monitoring wells (MW-105, MW-106S, and MW-106D) were installed in April 2023 to characterize groundwater in the vicinity of Monitoring Well MW-2 at locations indicated on **Figure 2**. As-built specifics of each characterization monitoring well installation are summarized on **Table 1**. A *Monitoring Well Construction Progress Report* (Burns & McDonnell, 2023c), included herein as **Appendix C**, was prepared to summarize the well installation activities. A copy of the Kentucky Department for Environmental Protection, Division of Waste Management (KDWM) approval letter for installing the characterization wells is included as Appendix A of the *Monitoring Well Construction Progress Report* provided in **Appendix C** of this Report. The characterization monitoring wells, located at downgradient positions east of the CCR unit, are being used to assist in the characterization of the arsenic in groundwater in the vicinity of Monitoring Well MW-2. The installation of these characterization monitoring wells at the Green Landfill included both soil and groundwater sampling.

Soil samples collected at the Green Landfill during the installation of the characterization monitoring wells were submitted to the following laboratories for the identified analyses:

- Pace in Indianapolis, Indiana
  - Total arsenic and iron
  - Synthetic precipitation leaching procedure for arsenic and iron
- Mineralogy, Inc. of Tulsa, Oklahoma
  - X-ray diffraction (bulk and clay)

Groundwater sampling of these newly installed characterization monitoring wells was performed to coincide with the semi-annual groundwater monitoring scheduled in 2023 under the CCR Rule. Groundwater samples from these new characterization wells and Monitoring Well MW-2 were submitted to the following laboratories for the identified analyses:

### First Half Semiannual Event (June 2023)

- Pace in Indianapolis, Indiana
  - Total arsenic and iron
  - Dissolved arsenic; field filtered (0.45 micrometer [ $\mu\text{m}$ ])
  - Dissolved arsenic; field filtered (0.20  $\mu\text{m}$ )
  - Ferric iron ( $\text{Fe}^{3+}$ ; total) (calculated from total iron laboratory results and field ferrous iron [ $\text{Fe}^{2+}$ ] results from colorimeter)

- Books Applied Labs in Seattle, Washington
  - Arsenic speciation for arsenite ( $\text{As}^{3+}$ ) and arsenate ( $\text{As}^{5+}$ )

Second Half Semiannual Event (November 2023)

- Pace in Madisonville, Kentucky
  - Total arsenic

Except for the soil x-ray diffraction and the groundwater arsenic speciation, laboratory analyses were performed in accordance with USEPA-approved methods. The x-ray diffraction of soil samples followed standard operating procedures of X-ray Diffraction and the Identification and Analysis of Clay Minerals (Moore, et al., 1989). The arsenic speciation was performed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry following proprietary methods and standard operating procedures. Monitoring well sampling forms for each of the groundwater monitoring events are included in **Appendix A**.

## 3.0 Data Evaluation

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### 3.1 Groundwater Flow

Measured depth to groundwater level data collected by BREC personnel and the calculated groundwater elevations during the 2023 monitoring events are summarized on **Table 3** (Green Landfill) and **Table 4** (Green Surface Impoundment). These data were used to construct piezometric surface maps to illustrate groundwater flow conditions for the uppermost aquifer. These data and figures are representative of general conditions at the CCR units and support the following analysis.

#### 3.1.1 Green Landfill

Overall, the predominate groundwater flow direction beneath the footprint of the Green Landfill is to the east and southeast towards the Green River and Groves Creek with a localized northeast flow component along the northern portion of the CCR unit (see **Figure 4** and **Figure 5**).

#### 3.1.2 Green Surface Impoundment

Overall, the predominate groundwater flow direction beneath the footprint of the Green Surface Impoundment is to the east and southeast towards the Green River with a localized northeast flow component along the northern portion of the CCR unit (see **Figure 6** and **Figure 7**).

### 3.2 Sampling Results

#### 3.2.1 Groundwater Sampling Results

During 2023, the following monitoring events were performed at the Station:

- Green Landfill: Two (2) assessment groundwater monitoring events and two (2) characterization groundwater monitoring events; and
- Green Surface Impoundment: Two (2) detection groundwater monitoring events.

Results from the assessment and characterization monitoring events are summarized on the tables included in **Appendix D** (Green Landfill) and **Appendix E** (Green Surface Impoundment) for each CCR unit. Complete copies of the analytical laboratory reports are included in **Appendix F** (Green Landfill) and **Appendix G** (Green Surface Impoundment) for each CCR unit. Laboratory data were validated and all data are considered viable for reporting as qualified with copies of the data validation reports provided in **Appendix H** (Green Landfill) and **Appendix I** (Green Surface Impoundment) for each CCR unit.

#### 3.2.2 Characterization Monitoring Well Soil Sampling Results

Results from the soil samples collected at the Green Landfill during the installation of the characterization monitoring wells (see **Section 2.2**) are summarized in the tables included in **Appendix D**. Complete copies of the analytical laboratory reports are included in **Appendix F**.

Laboratory data were validated and all data are considered viable for reporting as qualified with copies of the data validation reports provided in **Appendix H**.

### 3.3 Groundwater Statistical Evaluation

As part of previous assessment monitoring performed at the Green Landfill, background and downgradient monitoring wells for this CCR unit were sampled for Appendix IV constituents in 2018 through 2022. In accordance with 40 CFR §257.95, GWPS were established for detected Appendix IV constituents. Previous assessment monitoring results indicated the presence of an SSL above the GWPS in the following monitoring wells:

- Green Landfill: Lithium in monitoring wells MW-3A, MW-4, MW-5, and MW-6.

Previous detection monitoring results indicated no Appendix III SSIs at the Green Surface Impoundment and therefore this CCR unit was not subject to assessment monitoring and no SSL determination was required.

In accordance with 40 CFR §257.93(f), 40 CFR §257.93(h), and 40 CFR §257.95(d)(2), Burns & McDonnell conducted a statistical evaluation of the 2023 assessment groundwater data for the Green Landfill as part of developing this Report to identify any 2023 SSIs over background concentrations for the Appendix III and Appendix IV parameters and identify any 2023 SSLs over established GWPSs for detected Appendix IV parameters. Statistical methods were chosen in accordance with 40 CFR §257.93(f), while the rationale behind why each method was selected is outlined in the Statistical Methods Certification Document prepared for each CCR unit dated June 28, 2016 (Associated Engineers, Inc., 2016a and 2016b). Summaries of the 2023 statistical evaluation conducted on the Appendix III detection and Appendix IV assessment parameters for the Green Landfill and Green Surface Impoundment are provided as **Appendix J** and **Appendix K**, respectively. The results of each CCR unit specific evaluation are discussed below.

#### 3.3.1 Green Landfill Statistical Evaluation

The Green Landfill assessment monitoring data were evaluated using an inter-well approach that statistically compared constituent concentrations at downgradient compliance monitoring wells to those present at a upgradient/background monitoring well. For the Green Landfill, Monitoring Well MW-1 is designated as the background well because it is located upgradient of the CCR unit, whereas Monitoring Wells MW-2, MW-3A, MW-4, MW-5, and MW-6 are designated as compliance wells because they are located along the downgradient side of the CCR unit waste boundary.

As presented in **Appendix J**, the results of the statistical analysis indicate the following Appendix III constituents were observed as SSIs with concentrations above calculated background values in downgradient compliance monitoring wells.

2023 Appendix III SSIs - Green Landfill	
June 2023 Sampling Event	November 2023 Sampling Event
Calcium (MW-2, MW-3A, MW-4, MW-5, and MW-6)	Calcium (MW-2, MW-3A, MW-4, MW-5, and MW-6)
Chloride (MW-2, MW-3A, MW-4, MW-5, and MW-6)	Chloride (MW-2, MW-3A, MW-4, MW-5, and MW-6)
Sulfate (MW-2, MW-3A, MW-4, MW-5, and MW-6)	Sulfate (MW-2, MW-3A, MW-4, MW-5, and MW-6)
TDS (MW-2, MW-3A, MW-4, MW-5, and MW-6))	TDS (MW-2, MW-3A, MW-4, MW-5, and MW-6))

Boron and fluoride did not have any verified SSIs over background. Based on these results, assessment monitoring is required to continue at the Green Landfill on a semi-annual basis.

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

2023 Appendix IV SSIs - Green Landfill	
June 2023 Sampling Event	November 2023 Sampling Event
Arsenic (MW-2)	Arsenic (MW-2)
Barium (MW-2)	Barium (MW-2)
Lithium (MW-3A, MW-4, MW-5, and MW-6)	Lithium (MW-3A, MW-4, MW-5, and MW-6)
Mercury (MW-4)	Mercury (MW-4)
Molybdenum (MW-2)	Molybdenum (MW-2)
Selenium (MW-4)	--

The previously identified April 2022 Appendix IV constituent SSI for radium 226 + 228 (combined) at MW-5 did not reoccur in 2023.

These Appendix IV constituents with SSIs 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 pair 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. **Attachment J**, provides a summary of the LCLs and GWPSs for arsenic, barium, lithium, mercury, molybdenum, and selenium for the monitoring wells identified above for the semi-annual events, respectively. As presented

in **Appendix J**, the statistical analysis results indicate the following Appendix IV constituents were observed at SSLs over the GWPS.

2023 Appendix IV SSLs > GWPS - Green Landfill	
June 2023 Sampling Event	November 2023 Sampling Event
Arsenic (MW-2)	Arsenic (MW-2)
Lithium (MW-3A, MW-4, MW-5, and MW-6)	Lithium (MW-3A, MW-4, MW-5, and MW-6)

The LCLs for the remaining wells and Appendix IV constituents are less than the GWPS and thus are not considered SSLs.

The identified SSLs over the GWPS for lithium is consistent with previous statistical evaluations since 2018. On December 6, 2018, BREC posted a formal notification that lithium in Appendix IV had been detected at SSLs above the established GWPS as required by 40 CFR §257.95(g) and 40 CFR §257.107(h)(8). The identified SSLs over the GWPS for arsenic is consistent with the previous statistical evaluation in 2022 (the first SSL occurrence for arsenic). On October 3, 2022, BREC posted a formal notification that arsenic in Appendix IV has been detected at an SSL above the established GWPS as required by 40 CFR §257.95(g) and 40 CFR §257.107(h)(8).

### 3.3.2 Green Surface Impoundment Statistical Evaluation

The Appendix III detection monitoring data collected at the Green Surface Impoundment were statistically evaluated using an inter-well approach that compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the Green Surface Impoundment, Monitoring Well MW-11 is designated as the background well because it is located upgradient of the CCR unit, whereas Monitoring Wells MW-12, MW-13, and MW-14 are designated as compliance wells because they are located along the downgradient side the CCR unit waste boundary.

The statistical analysis results indicate that none of the Appendix III constituents (boron, calcium, chloride, fluoride, pH, sulfate, or TDS) have verified SSIs over their background upper prediction limit (see **Appendix K**). In addition, pH does not have a verified SSI below its lower prediction limit. A summary of the statistical evaluations conducted on the detection Appendix III parameters for the Green Surface Impoundment is provided as **Appendix K**. Based on these results, assessment monitoring is not currently required at the Green Surface Impoundment and detection monitoring will continue.

## 3.4 Conclusion

Based upon the statistical evaluation of Appendix III and Appendix IV parameters collected during assessment monitoring at the Green Landfill in 2023, BREC is required to continue semi-annual assessment monitoring in 2024. The identified Appendix IV arsenic concentration at downgradient Monitoring Well MW-2 at an SSL above the GWPS (see Section 3.3.1) was its first SSL occurrence at the Green Landfill in 2022 with formal notification posted by BREC on October 3, 2022, and further groundwater characterization is planned in 2023 (see **Section 5.2**).

Based upon the statistical evaluation of Appendix III parameters collected during detection monitoring at the Green Surface Impoundment in 2023, BREC is required to continue semi-annual detection monitoring in 2024.

## 4.0 Certifications and Notifications to the Operating Record

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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:

- *2022 Annual Groundwater Monitoring and Corrective Action Report for the Federal Coal Combustion Residual Rule, Big Rivers Electric Corporation, Sebree Generating Station* (Burns & McDonnell, 2023b);
- Document the 2023 groundwater concentrations of Appendices III and IV parameters in the facility operating record as required by 40 CFR §257.95(d)(1);
- Calculated 2023 GWPSs;
- *Statistical Evaluation of June 2023 Assessment Monitoring Groundwater Data, Sebree Generating Station, Green Landfill in Robards, Kentucky* (Burns & McDonnell, 2023d; **Appendix J**);
- *Statistical Evaluation of June 2023 Detection Monitoring Groundwater Data, Sebree Generating Station, Green Surface Impoundment in Robards Kentucky* (Burns & McDonnell, 2023e; **Appendix K**);
- *Statistical Evaluation of November 2023 Assessment Monitoring Groundwater Data, Sebree Generating Station, Green Landfill in Robards Kentucky* (Burns & McDonnell, 2023f; **Appendix J**); and
- *Statistical Evaluation of November 2023 Detection Monitoring Groundwater Data, Sebree Generating Station, Green Surface Impoundment in Robards Kentucky* (Burns & McDonnell, 2023g; **Appendix K**).



## 5.0 Key Activities Planned for 2024

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Anticipated activities for the next 2024 annual reporting period include continued groundwater monitoring, continued closure activities at the Green Surface Impoundment, and groundwater characterization for the Green Landfill (Appendix IV arsenic and lithium SSL above GWPSs).

### 5.1 Groundwater Monitoring

Continued semi-annual assessment monitoring of all operating permit monitoring wells and subsequent statistical evaluations for the Green Landfill are planned for 2024. The semi-annual assessment monitoring will include two (2) assessment groundwater monitoring events and two (2) characterization groundwater monitoring events.

For the Green Surface Impoundment, continued semi-annual detection monitoring of all operating permit monitoring wells with subsequent statistical evaluations are planned for 2024. The semi-annual detection monitoring will include two (2) detection groundwater monitoring events (unless an SSI triggers assessment monitoring).

### 5.2 Green Surface Impoundment Closure Activities

The Green Surface Impoundment began closure activities in 2022 and are scheduled to be finalized by the end of the first quarter of 2024.

### 5.3 Green Landfill Groundwater Characterization

The statistical evaluations of the 2023 groundwater data at the Green Landfill identified Appendix IV arsenic (first occurrence in 2022) and lithium (first occurrence in 2018) at concentrations at downgradient monitoring wells at SSLs above the GWPSs (see **Section 3.3.1**). In accordance with 40 CFR §257.96(g)(1), characterization of the “nature and extent of the release and any relevant site conditions that may affect the remedy ultimately selected” with the caveat that the “characterization must be sufficient to support a complete and accurate assessment of the corrective measures necessary to effectively clean up all releases from the CCR unit pursuant to 40 CFR §257.96”.

The Green Landfill was previously subject to corrective action to address the following impacts:

1. Lithium in groundwater at an SSL above the GWPS in four monitoring wells (MW-3A, MW-4, MW-5, and MW-6) at the CCR unit and
2. Address Notices of Violation received from KDWM in regard to unpermitted discharges and seepage emanating from the CCR unit.

To address these impacts, a *Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report* (AECOM, 2020c) was completed documenting the 2019 and 2020 implementation of the corrective action remedy. Alternative #5 from the ACM was selected as the remedy to address both groundwater and non-groundwater impacts at the Green

Landfill consisting of consisting of closure-in-place, other source controls, institutional controls, and groundwater monitoring. In 2019 and 2020, source controls were implemented consisting of the construction of a deep collection trench along the east side of the Green Landfill (referred to as the Deep Seep Collection Trench or Eastern Collection Trench) and the construction of a series of shallower collection trenches along the north side of the Green Landfill (referred to as the Northwest Seep Collection Trench). In 2020 and 2021, shallow collection trenches were constructed around the perimeter of the Green Landfill and residual CCR material was removed from the South Sediment Basin to comply with an Agreed Order signed by BREC and KDWM. These source control measures implemented to date are intended to capture non-groundwater releases from migrating beyond the functional perimeter of the Unit and the property controlled by BREC.

The most recently observed groundwater impact of arsenic at an SSL above the GWPS was in Monitoring Well MW-2 following statistical analysis performed in association with both the 2022 and 2023 groundwater monitoring events. Monitoring Well MW-2 is located on the northeastern, downgradient side of the waste boundary of the CCR unit, and directly north of the Deep Seep Collection Trench (see **Figure 2**). The closest monitoring well to Monitoring Well MW-2 is Monitoring Well MW-3A to the south, which is over 1,000 feet offset from Monitoring Well MW-2 and does not exhibit arsenic detections. Thus, the existing monitoring well network provided an insufficient delineation of the observed arsenic impact in groundwater downgradient of the CCR unit. In order to evaluate the nature and extent of arsenic impacts in groundwater at Monitoring Well MW-2, three additional characterization monitoring wells (MW-105, MW-106S, and MW-106D) were installed at the CCR unit (see **Section 2.2**) in accordance with the KDWM-approved *2023 Monitoring Well Installation Work Plan* (Burns & McDonnell, 2023a).

The additional data collected and continued semi-annual groundwater monitoring from these newly installed characterization monitoring wells will be incorporated into the conceptual site model and used to evaluate the source and extent of arsenic impacts.

## 6.0 References

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## TABLES

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TABLE 1

**SUMMARY OF MONITORING WELL CONSTRUCTION, GREEN LANDFILL  
CCR GROUNDWATER MONITORING PROGRAM**

**BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION  
GREEN STATION LANDFILL  
WEBSTER COUNTY, KENTUCKY**

Well No.	Location*	Reference Elevation*		Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval		Screened Interval		Bottom of Boring (feet, GS)		
		TOIC (feet, NAV88)	GS (feet, NAVD88)			(feet, GS, NADV88)	(feet, GS, NAVD88)					
Program	Lat	Long				Top	Bottom	Top	Bottom			
<b>Monitoring Wells</b>												
MW-1 (8002-9625)	U / B	37.637800	-87.508100	423.23	420.2	45.5	4 inch / PVC	389.9	377.7	387.7	377.7	45
MW-2 (8002-9630)	D	37.636300	-87.500900	392.37	389.9	50.3	4 inch / PVC	354.1	342.1	352.1	342.1	49
MW-3A (8003-6430)	D	37.631900	-87.500900	386.48	380.7	41.3	4 inch / PVC	357.2	344.5	355.2	345.2	36.2
MW-4 (8002-9628)	D	37.628100	-87.501100	391.33	388.8	33.1	4 inch / PVC	370.2	358.2	368.2	358.2	33
MW-5 (8002-9627)	D	37.628318	-87.503480	390.18	387.7	27.5	4 inch / PVC	374.7	362.7	372.7	362.7	26
MW-6 (8002-9626)	D	37.628555	-87.507413	388.17	385.7	45.5	4 inch / PVC	354.9	342.7	352.7	342.7	45
<b>Characterization Well</b>												
MW-104 (8007-1139)	D / C	37.630519	-87.500959	395.13	392.47	60.84	2 inch / PVC	347.5	332.5	342.5	332.5	60
MW-105 (8008-0529)	D / C	37.636833	-87.500928	381.77	378.90	33.87	2 inch / PVC	359.9	346.9	358.1	348.1	32
MW-106S (8008-0527)	D / C	37.636178	-87.500928	387.26	384.75	41.51	2 inch / PVC	357.8	344.8	356.0	346.0	40
MW-106D (8008-0528)	D / C	37.636194	-87.500947	387.88	385.30	66.08	2 inch / PVC	333.8	321.3	332.0	322.0	64

\* Reference elevation of monitoring wells MW-1 through MW-6 surveyed by Fuller, Mossbarger, Scott and May, Civil Engineers, Inc., Lexington, Kentucky, December 1996 and December 1999. Reference elevation of monitoring well MW-104 surveyed by Associated Engineers Inc., March 19, 2019. New characterization monitoring wells MW-105, MW-106S, and MW-106D surveyed by Associated Engineers, Inc. of Madisonville, KY on May 19, 2023. Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, North American Datum of 1927 (NAD27) datum.

C = Characterization

D = Downgradient

GS = Ground surface

ID = Internal diameter

Lat./Long. = Latitude and longitude

NAVD88 = North American Vertical Datum of 1988

PVC = Polyvinyl chloride

TOIC = Top of internal casing

U / B = Upgradient / Background

TABLE 2

SUMMARY OF MONITORING WELL CONSTRUCTION, GREEN SURFACE IMPOUNDMENT  
CCR GROUNDWATER MONITORING PROGRAM

BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION  
GREEN STATION SURFACE IMPOUNDMENT  
WEBSTER COUNTY, KENTUCKY

Well No.	Program	Location*		Reference Elevation*		Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval		Screened Interval		Bottom of Boring (feet, GS)
		Lat	Long	TOIC (feet, NAV88)	GS (feet, NAV88)			Top (feet, GS, NADV88)	Bottom (feet, GS, NADV88)	Top (feet, GS, NADV88)	Bottom (feet, GS, NADV88)	
MW-11 (8006-3938)	U / B	37.64262	-87.50325	401.32	398.36	51.5	2 inch / PVC	356.86	348.46	354.86	349.86	49.5
MW-12 (8006-3939)	D	37.63915	-87.50182	395.54	392.35	73.7	2 inch / PVC	333.85	320.35	331.85	321.85	72.0
MW-13 (8006-3940)	D	37.64086	-87.50072	394.60	391.46	52.6	2 inch / PVC	348.96	339.96	346.96	341.96	51.5
MW-14 (8006-3941)	D	37.64220	-87.50001	390.71	387.55	50.0	2 inch / PVC	347.75	337.95	345.75	340.75	49.6

\*Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky, January 2015  
Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, North American Datum of 1927 (NAD27) datum.

D = Downgradient  
GS = Ground surface  
ID = Internal diameter  
Lat./Long. = Latitude and longitude  
NAVD88 = North American Vertical Datum of 1988  
PVC = Polyvinyl chloride  
TOIC = Top of internal casing  
U / B = Upgradient / Background



**TABLE 3**  
**GROUNDWATER ELEVATIONS, GREEN LANDFILL - 2023**  
**BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION**  
**GREEN STATION LANDFILL**  
**WEBSTER COUNTY, KENTUCKY**

<b>GROUNDWATER MONITORING WELL PROGRAM</b>												
<b>Reference Elevation TOIC*(ft, NADVD88)</b>	<b>MW-1</b>		<b>MW-2</b>		<b>MW-3A</b>		<b>MW-4</b>		<b>MW-5</b>		<b>MW-6</b>	
	Upgradient/Background 422.56		Downgradient 391.82		Downgradient 386.27		Downgradient 391.11		Downgradient 389.81		Downgradient 388.10	
<b>Date Measured</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>
6/22/2023**	19.31	403.25	21.80	370.02	18.50	367.77	27.34	363.77	15.21	374.60	21.44	366.66
11/6/2023	21.19	401.37	23.17	368.65	19.20	367.07	28.83	362.28	15.28	374.53	21.72	366.38
<b>Reference Elevation TOIC*(ft, NADVD88)</b>	<b>MW-104</b>		<b>MW-105</b>		<b>MW-106S</b>		<b>MW-106D</b>					
	Characterization 395.40		Characterization 381.77		Characterization 387.26		Characterization 387.88					
<b>Date Measured</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>				
6/22/2023**	25.60	369.80	9.76	372.01	22.75	364.51	26.12	361.76				
11/6/2023	25.83	369.57	10.79	370.98	23.50	363.76	26.44	361.44				

\* Reference elevation of monitoring Wells resurveyed on May 19, 2023 by Associated Engineers, Inc. of Madisonville, KY.

\*\* Water levels measured between June 22-25, 2023.

ft = feet

GW = Groundwater

NAVD88 = North American Vertical Datum of 1988

TOIC = Top of internal casing

**TABLE 4**  
**GROUNDWATER ELEVATIONS, GREEN SURFACE IMPOUNDMENT - 2023**  
**GREEN STATION SURFACE IMPOUNDMENT**

**BIG RIVERS ELECTRIC CORPORATION**  
**SEBREE STATION**  
**WEBSTER COUNTY, KENTUCKY**

	<b>GROUNDWATER MONITORING WELL PROGRAM</b>							
	<b>MW-11</b>		<b>MW-12</b>		<b>MW-13</b>		<b>MW-14</b>	
	<b>Upgradient/Background</b>		<b>Downgradient</b>		<b>Downgradient</b>		<b>Downgradient</b>	
<b>Reference Elevation TOIC*(ft, NADVD88)</b>	401.32		395.54		394.60		390.71	
<b>Date Measured</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>	<b>Depth to Water (ft, TOIC)</b>	<b>GW Elevation (ft, NAVD88)</b>
6/25/2023	22.40	378.92	28.20	367.34	22.20	372.40	26.60	364.11
11/6/2023	27.43	373.89	31.21	364.33	22.99	371.61	27.72	362.99

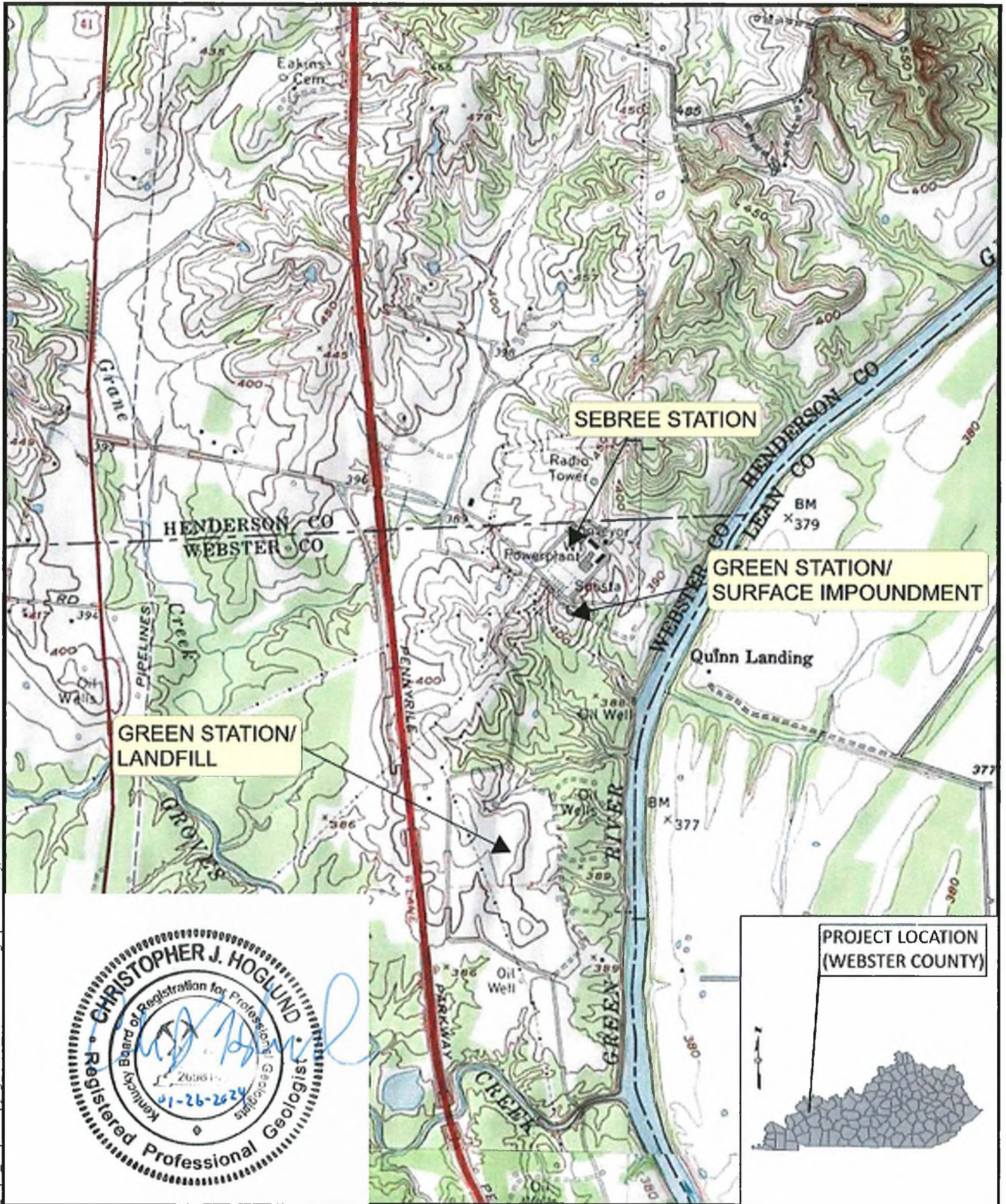
\*Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky, January 2015

ft = feet  
 GW = Groundwater  
 NAVD88 = North American Vertical Datum of 1988  
 TOIC = Top of internal casing

## FIGURES





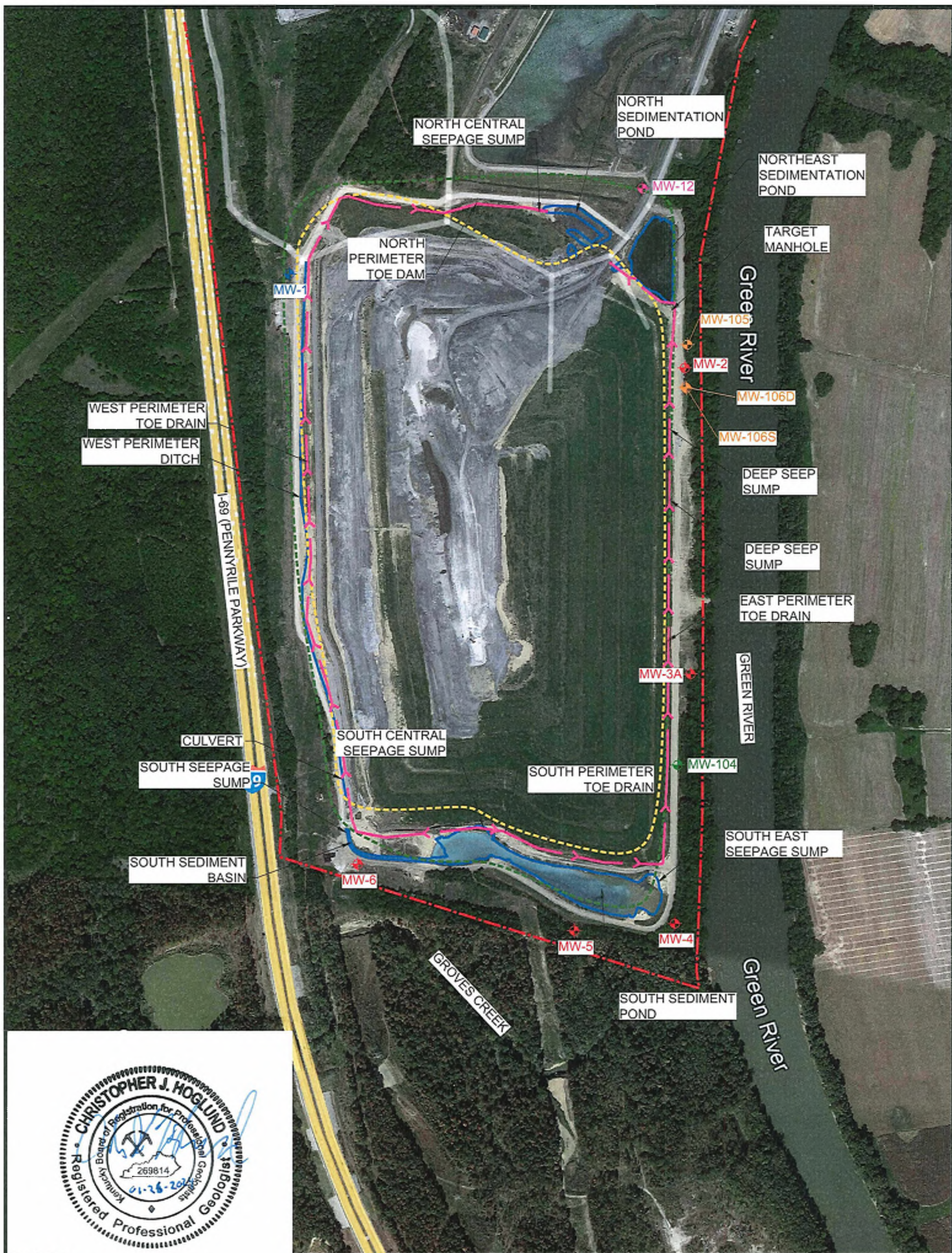


UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
ROBARDS QUADRANGLE  
DELAWARE QUADRANGLE  
(FROM ARCGIS ONLINE Copyright © 2011 National Geographic Society, i-cubed)  
0 1,000 2,000  
Scale in Feet



Figure 1  
General Location Map  
Sebree Station  
Webster County, Kentucky





**LEGEND:**

- [---] PROPERTY LINE
- [---] KAR PERMIT AREA
- [---] CCR FILL AREA
- [\*] DOWNGRADIENT CCR MONITORING WELL
- [\*] UPGRADIENT CCR MONITORING WELL
- [\*] CHARACTERIZATION WELL
- [\*] NEW CHARACTERIZATION WELL (INSTALLED APRIL 2023)
- [\*] CCR SURFACE IMPOUNDMENT MONITORING WELL (WATER LEVEL ONLY)
- [---] TOE DRAIN PIPE
- [---] WEST DITCH



0 200 400  
SCALE IN FEET



Figure 2  
CCR GROUNDWATER  
MONITORING SYSTEM  
GREEN LANDFILL,  
WEBSTER COUNTY, KENTUCKY





- Impoundment Unit Boundary
- - - Property Line
- ⊕ Downgradient CCR Monitoring Well
- ⊕ Upgradient CCR Monitoring Well



Figure 3  
CCR Groundwater  
Monitoring System  
Green Surface Impoundment  
Webster County, Kentucky





**LEGEND:**

- - - PROPERTY LINE
- - - KAR PERMIT AREA
- - - CCR FILL AREA
- ◆ DOWNGRADIENT CCR MONITORING WELL
- ◆ UPGRADIENT CCR MONITORING WELL
- ◆ CHARACTERIZATION WELL
- 370— GROUNDWATER CONTOUR
- 403.25 GROUNDWATER ELEVATION
- FLOW DIRECTION
- ◆ NEW CHARACTERIZATION WELL (INSTALLED APRIL 2023)
- ◆ CCR SURFACE IMPOUNDMENT MONITORING WELL (WATER LEVEL ONLY)

**NOTE:**

CHARACTERIZATION WELLS MW-106D NOT USED IN CONTOURING.

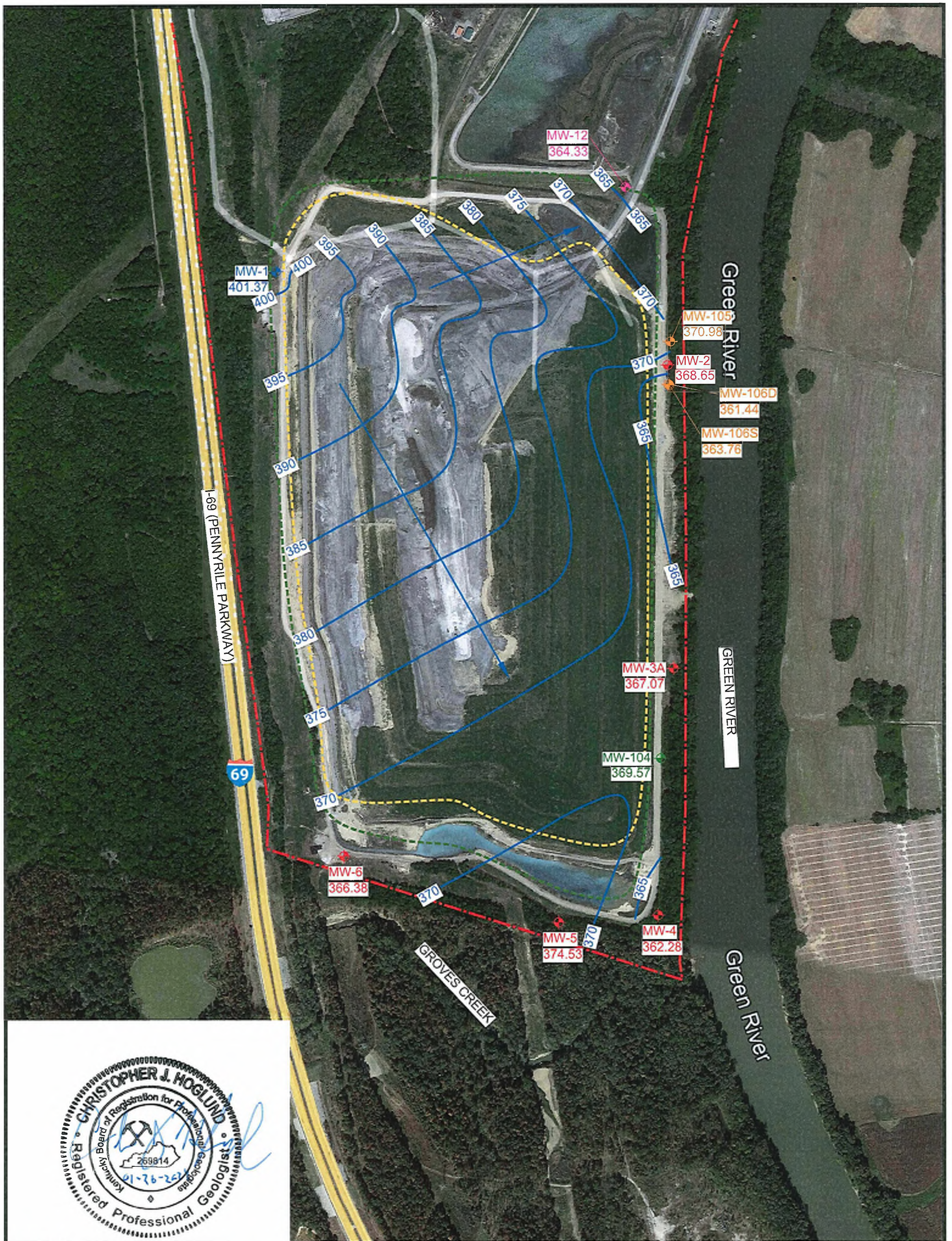


0 250 400  
SCALE IN FEET



Figure 4  
POTENTIOMETRIC SURFACE MAP  
JUNE 22, 2023  
GREEN LANDFILL,  
WEBSTER COUNTY, KENTUCKY





**LEGEND:**

- - - PROPERTY LINE
- - - KAR PERMIT AREA
- - - CCR FILL AREA
- ◆ DOWNGRADE CCR MONITORING WELL
- ◆ UPGRADIENT CCR MONITORING WELL
- ◆ CHARACTERIZATION WELL
- 370— GROUNDWATER CONTOUR
- 401.37 GROUNDWATER ELEVATION
- FLOW DIRECTION
- ◆ NEW CHARACTERIZATION WELL (INSTALLED APRIL 2023)
- ◆ CCR SURFACE IMPOUNDMENT MONITORING WELL (WATER LEVEL ONLY)

**NOTE:**

CHARACTERIZATION WELLS MW-106D NOT USED IN CONTOURING.

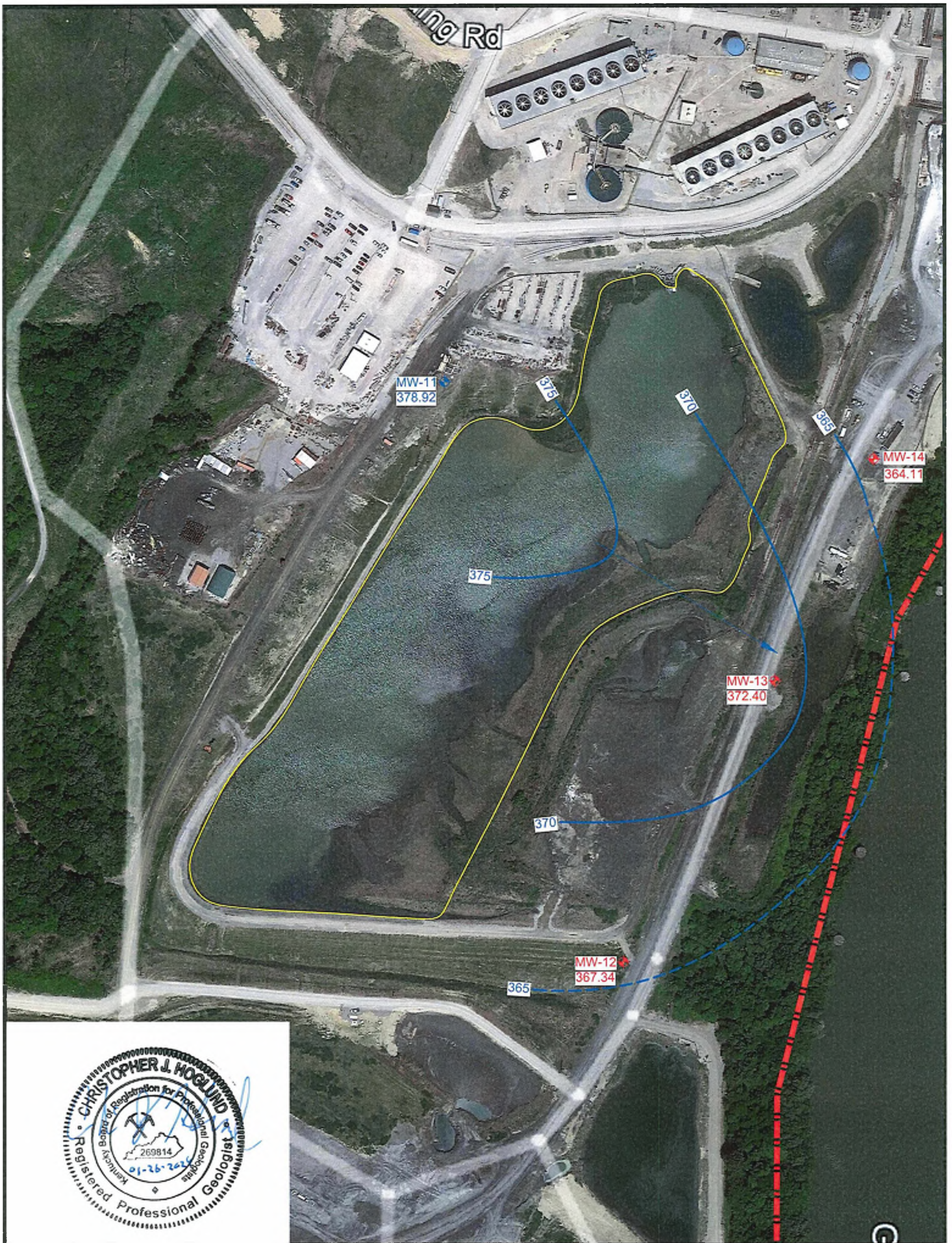


0 200 400  
SCALE IN FEET



Figure 5  
POTENTIOMETRIC SURFACE MAP  
NOVEMBER 6, 2023  
GREEN LANDFILL,  
WEBSTER COUNTY, KENTUCKY





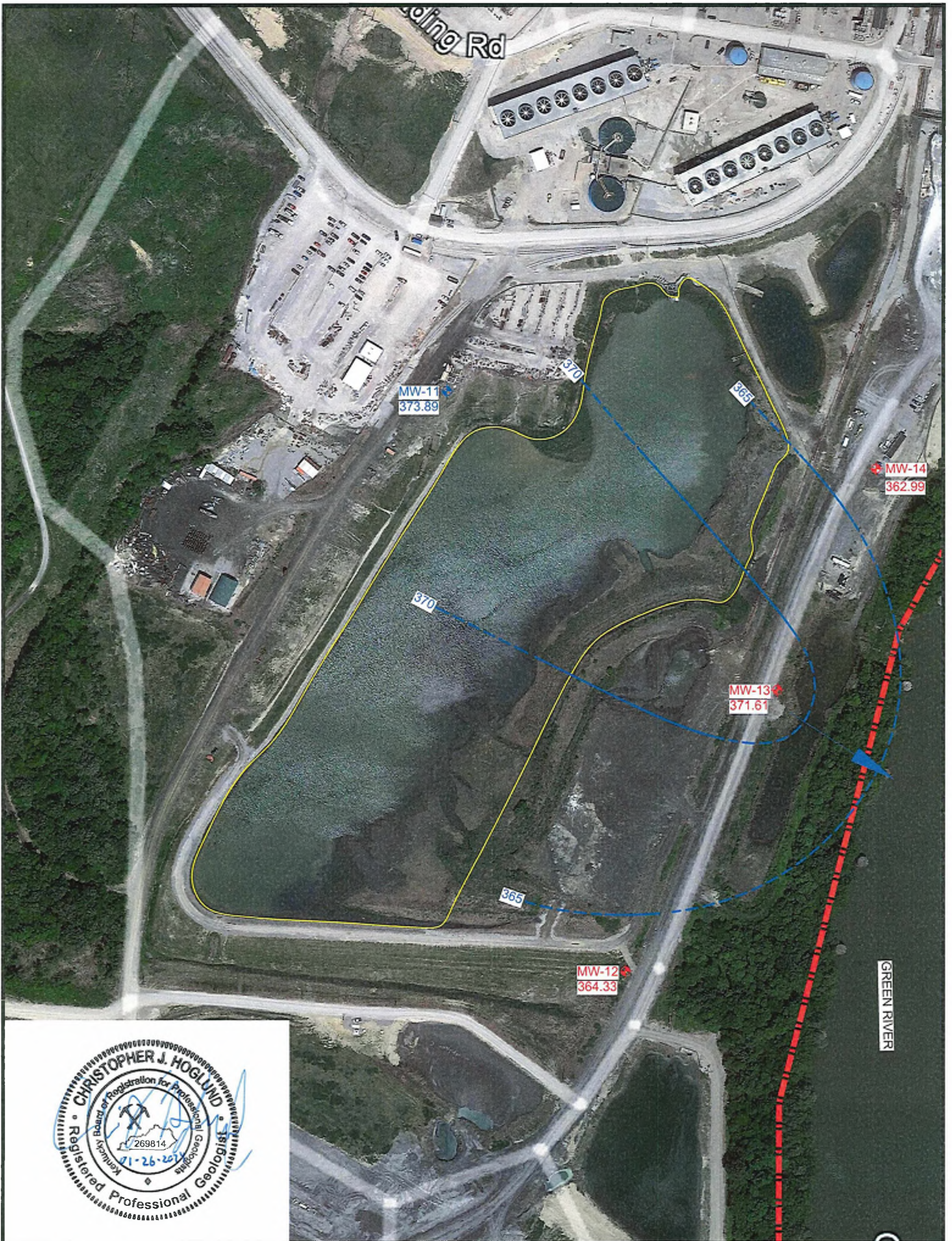
**LEGEND:**

- PROPERTY LINE
- IMPOUNDMENT UNIT BOUNDARY
- DOWNGRAIDENT CCR MONITORING WELL
- UPGRADIENT CCR MONITORING WELL
- GROUNDWATER CONTOUR
- 378.92 GROUNDWATER ELEVATION
- FLOW DIRECTION (DASHED WHERE INFERRED)



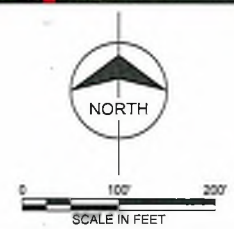
Figure 6  
 POTENTIOMETRIC SURFACE MAP  
 JUNE 25, 2023  
 SURFACE IMPOUNDMENT,  
 WEBSTER COUNTY, KENTUCKY





**LEGEND:**

- PROPERTY LINE
- IMPOUNDMENT UNIT BOUNDARY
- DOWNGRAIDENT CCR MONITORING WELL
- UPGRADIENT CCR MONITORING WELL
- GROUNDWATER CONTOUR
- 373.89 GROUNDWATER ELEVATION
- FLOW DIRECTION (DASHED WHERE INFERRED)



	<p>Figure 7 POTENTIOMETRIC SURFACE MAP NOVEMBER 6, 2023 SURFACE IMPOUNDMENT, WEBSTER COUNTY, KENTUCKY</p>
--	---



## **APPENDIX A - GREEN LANDFILL FIELD SAMPLING FORMS**

---



6/22/2023  
 Auto-Calibration  
 pH: 3.99 Sv  
 Cond: 4.47 mS/cm  
 Turb:  $\emptyset$   
 DO: 10.11 mg/L

Sebree Station  
 9000 Highway 2096  
 Robards, KY 42452  
 www.bigrivers.com

①

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-1</b>	Total Depth (ft.) <b>45.53</b>	Initial Depth to Water (ft.) <b>19.31</b>	Height of Water Column (ft.) <b>26.22</b>	Date: <b>6/22/23</b>	Time: <b>1000</b>					
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9625</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>423.23</del> <b>422.56</b>	Groundwater Elevation (ft.) <b>403.25</b>	Well Vol. (Gal.) <b>~17.57</b>	PO # <b>-</b>					
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70</b> (F)											
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L	
0930	$\emptyset$	19.31	~250 ml	$\emptyset$	15.93	6.48	-108	0.989	2.8	0.84	
0935	5	20.14	↓	1.25	15.44	7.02	-111	0.983	$\emptyset$	0.75	
0940	10	20.75	↓	2.5	15.44	7.11	-90	0.992	$\emptyset$	$\emptyset$	
0945	15	21.10	~200 ml	3.5	15.36	7.10	-78	0.984	$\emptyset$	$\emptyset$	
0950	20	21.61	↓	4.5	15.50	7.15	-72	0.987	$\emptyset$	$\emptyset$	
0955	25	21.92	↓	5.5	15.40	7.16	-65	0.984	$\emptyset$	$\emptyset$	
1000	30	22.10	↓	6.5	15.50	7.15	-65	0.980	$\emptyset$	$\emptyset$	
<i>My Desk</i>											
For three (3) consecutive Readings		Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5 mg/l stable		
Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Casing PVC <input type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				
Good	Good	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample With: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No					
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)		
1000	22.10	CLEAR	NONE	15.50	0.980	$\emptyset$	7.15	-65	$\emptyset$		

city fill  
 25-300



Auto-Rel. 6-24-23

pH: 3.99 SU  
 Cond: 4.49 ms/cm  
 Turb:  $\emptyset$  NTU  
 DO: 9.18 mg/L

Sebree Station  
 9000 Highway 2096  
 Robards, KY 42452  
 www.bigrivers.com

# CCR GROUNDWATER FIELD LOG

FIELD  
 BLANK @ 1300  
 (7)

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-2</b>	Total Depth (ft.) <b>50.27</b>	Initial Depth to Water (ft.) <b>21.80</b>	Height of Water Column (ft.) <b>28.47</b>	Date: <b>6-24-23</b>	Time: <b>0750</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9630</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>392.37</del> <b>391.82</b>	Groundwater Elevation (ft.) <b>370.02</b>	Well Vol. (Gal.) <b>~19.07</b>	PO # <b>-</b>

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)
0725	$\emptyset$	21.80	~318 ml	$\emptyset$	16.61	1.90	$\emptyset$	6.30	-75	51.7
0730	5	23.10			16.49	1.93	$\emptyset$	6.29	-88	34.7
0735	10	23.30			16.42	1.92	$\emptyset$	6.28	-92	26.2
0740	15	24.10			16.44	1.92	$\emptyset$	6.31	-92	19.6
0745	20	24.60			16.45	1.89	$\emptyset$	6.34	-94	19.2
0750	25	24.80			16.34	1.91	$\emptyset$	6.33	-94	18.9
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

Grey Disk

Well Condition <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected Time:	<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>
				Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input checked="" type="checkbox"/>

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
0750	24.80	CLEAR	NONE	16.34	1.91	$\emptyset$	6.33	-94	18.9

⑥

DVPE @ 1040

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-3A</b>	Total Depth (ft.) <b>41.30</b>	Initial Depth to Water (ft.) <b>18.50</b>	Height of Water Column (ft.) <b>22.8</b>	Date: <b>6-23-2023</b>	Time: <b>1010</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8003-6430</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16	Measuring Point (ft.) <del>386.48</del> <b>910</b> <b>386.27</b>	Groundwater Elevation (ft.) <b>367.77</b>	Well Vol. (Gal.) <b>~15.28</b>	PO # <b>—</b>

Rain    Sleet/Freezing Rain    Snow    Fog    Clear    Partly Cloudy    Windy   Temp. **70** (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)
0945	0	18.50	~310 ml	0	17.55	7.14	6.57	7.21	179	36.9
0950	5	18.60		1.59	15.79	7.46	1.51	6.96	426	0.9
0955	10	18.71		3.18	15.67	7.37	0.46	6.99	554	0
1000	15	18.43		4.77	15.45	7.38	0.24	6.98	563	0
1005	20	18.40		6.36	15.36	7.38	0.15	6.97	570	0
1010	25	18.41		7.95	15.27	7.40	0.08	6.94	570	0

*Plug Check* →

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 <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	<input checked="" type="checkbox"/> Duplicated Collected Time: <b>1040</b>
				Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:	<input checked="" type="checkbox"/> Semi-Annual

Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
1010	18.41	CLEAR	NONE	15.27	7.40	0.08	6.94	570	0



# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-4</b>	Total Depth (ft.) <b>33.13</b>	Initial Depth to Water (ft.) <b>27.34</b>	Height of Water Column (ft.) <b>5.79</b>	Date: <b>6-22-23</b>	Time: <b>1630</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9628</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16	Measuring Point (ft.) <del>391.33</del> <b>391.11</b>	Groundwater Elevation (ft.) <b>363.77</b>	Well Vol. (Gal.) <b>~3.87</b>	PO # <b>-</b>

Rain    Sleet/Freezing Rain    Snow    Fog    Clear    Partly Cloudy    Windy   Temp. **76** (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)
1530	0	27.34	~125 ml	0	18.26	6.15	4.03	6.84	124	0
1535	5	27.80			17.90	6.40	1.54	6.68	153	0
1540	10	27.91			16.64	6.13	1.94	6.64	203	0
1545	15	28.04			16.54	6.00	3.00	6.54	302	0
1550	20	28.20			16.01	5.97	2.79	6.54	338	0
1555	25	28.31			16.11	5.94	3.00	6.52	404	0
1600	30	28.42			16.20	5.98	3.55	6.50	452	0
1605	35	28.50			16.13	6.01	3.69	6.50	484	0
1610	40	28.71			16.17	6.02	3.22	6.50	507	0
1615	45	28.81			16.21	6.02	3.37	6.51	521	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 <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>
				Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	With: <input checked="" type="checkbox"/>		

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
1630	28.99	CLEAR	NONE	16.19	6.04	3.15	6.52	538	0

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>		Well No. <b>MW-4</b>		Total Depth (ft.) <b>33.13</b>		Initial Depth to Water (ft.)		Height of Water Column (ft.)		Date:		Time:	
Site Location: <b>Webster Co, KY</b>		AKGWA# <b>8002-9628</b>		Casing Diameter <input type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16		Measuring Point (ft.) <del>391.33</del> <i>391.11</i>		Groundwater Elevation (ft.)		Well Vol. (Gal.)		PO #	
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> 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)			
1620	50	28.85	~125 <i>AD</i>		16.23	6.02	3.31	6.52	527	∅			
1625	55	28.91	↓		16.35	6.01	3.05	6.52	534	∅			
1630	60	28.99	↓		16.19	6.04	3.15	6.52	538	∅			
<i>J. Deak</i>													
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 <input type="checkbox"/>	Casing PVC <input type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No		Field Blank Collected Time:		Duplicated Collected Time:			
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No					Split Sample <input type="checkbox"/> Yes <input type="checkbox"/> No		Semi-Annual <input type="checkbox"/>			
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)				



3

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-5</b>	Total Depth (ft.) <b>27.48</b>	Initial Depth to Water (ft.) <b>15.21</b>	Height of Water Column (ft.) <b>12.27</b>	Date: <b>6-22-23</b>	Time: <b>1240</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9627</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>390.18</del> <b>389.81</b>	Groundwater Elevation (ft.) <b>374.60</b>	Well Vol. (Gal.) <b>~8.22</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>73</b> (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)
1210	0	15.21	~400 ml	0	15.49	5.61	8.17	6.95	113	0
1215	5	16.00	↓		15.68	5.68	4.47	6.86	115	0
1220	10	16.61	↓		15.39	5.64	2.03	6.74	142	0
1225	15	16.94	↓		15.27	5.64	0.94	6.59	143	0
1230	20	17.40	~320 ml		15.29	5.62	0.72	6.54	142	0
1235	25	18.01	↓		15.39	5.68	0.73	6.46	139	0
1240	30	18.22	↓		15.33	5.69	0.71	6.47	140	0
<i>dry</i>										
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 <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected Time: <b>N/A</b>	Duplicated Collected Time: <b>N/A</b>		Semi-Annual <input checked="" type="checkbox"/>	
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	With: <input checked="" type="checkbox"/>				
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1240	18.22	CLEAR	NONE	15.33	5.69	0.71	6.47	140	0	

(2)

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-6</b>	Total Depth (ft.) <b>45.47</b>	Initial Depth to Water (ft.) <b>21.44</b>	Height of Water Column (ft.) <b>24.03</b>	Date: <b>6/22/2023</b>	Time: <b>1145</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9626</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>388.17-940</del> <b>388.10</b>	Groundwater Elevation (ft.) <b>366.66</b>	Well Vol. (Gal.) <b>~16.10</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>72</b> (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)
1045	0	21.44	~400 ml	0	18.42	3.83	2.96	6.75	-22	0
1050	5	21.77	↓	2	17.43	4.92	0	6.57	-8	0
1055	10	21.79	~375 ml	3.875	16.70	4.99	0	6.63	26	58
1100	15	21.60		5.75	16.62	4.96	0	6.56	71	0
1105	20	21.76		7.625	16.71	4.96	0	6.55	71	0
1110	25	21.71		9.5	16.65	4.94	0	6.60	83	1.0
1115	30	21.70		11.375	16.66	4.95	0	6.62	83	4.2
1120	35	21.7		13.25	16.57	4.95	0	6.56	84	6.3
1125	40	21.7		15.125	16.49	4.86	0	6.65	90	10.9
1130	45	21.7		17.0	16.55	4.95	0	6.65	91	22.7
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 <input type="checkbox"/>	Casing PVC <input type="checkbox"/>		<input type="checkbox"/> Field Blank Collected Time:		<input type="checkbox"/> Duplicated Collected Time:	
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		With:		<input checked="" type="checkbox"/> Semi-Annual	
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1145	21.70	CLEAR	NONE	16.57	4.92	0	6.60	94	64.2	

# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-6</b>	Total Depth (ft.) <b>45.47</b>	Initial Depth to Water (ft.)	Height of Water Column (ft.)	Date:	Time:				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9626</b>	Casing Diameter <input type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>388.17</del> <b>388.10</b>	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> 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)
1135	50	21.7	~375 ml	18.875	16.46	4.93	⊖	6.63	92	29.6
1140	55	21.7	↓	20.75	16.40	4.93	⊖	6.63	92	58.2
1145	60	21.7	↓	22.625	16.57	4.92	⊖	6.60	94	64.2
<i>Jay Dink</i>										
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 <input type="checkbox"/>	Casing PVC <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time:		<input type="checkbox"/> Duplicated Collected Time:		
		<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input type="checkbox"/> No	With:		Semi-Annual <input type="checkbox"/>		
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	





6-23-23  
 Auto-Cal.:  
 pH: 3.99 SU  
 Cond: 4.48 mS/cm  
 Turb: 0 NTU  
 DO: 10.01 mg/L  
 MK

(5)

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# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-104</b>	Total Depth (ft.) <b>60.84</b>	Initial Depth to Water (ft.) <b>25.60</b>	Height of Water Column (ft.) <b>35.24</b>	Date: <b>6-23-23</b>	Time: <b>0850</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8007-1139</b>	Casing Diameter □ 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>395.13</del> <del>910</del> <b>395.40</b>	Groundwater Elevation (ft.) <b>369.8</b>	Well Vol. (Gal.) <b>~5.64</b>	PO # <b>-</b>

Rain  
  Sleet/Freezing Rain  
  Snow  
  Fog  
  Clear  
  Partly Cloudy  
  Windy  
 Temp. **67** (F)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
0830	0	25.60	~488 ml	0	17.04	6.06	146	8.33	1.8	0
0835	5	26.10	↓	2.44	16.55	6.43	50	8.40	0.6	0
0840	10	28.22	~199 ml	3.475	16.52	6.51	35	8.39	0	0
0845	15	29.31	↓	4.43	16.49	6.54	33	8.37	0	0
0850	20	29.50	↓	5.425	16.54	6.54	28	8.39	1.0	0
<i>Log Did</i>										

get log from  
 to ~8:30  
 fill time 8:30

For three (3) consecutive Readings	Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
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Well Condition <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time:	Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time:
				Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:	Semi-Annual <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
0850	29.50	CLEAR	NONE	16.54	8.39	0	6.54	28	1.0

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# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>TAW-105</b>	Total Depth (ft.) <b>33.87</b>	Initial Depth to Water (ft.) <b>9.76</b>	Height of Water Column (ft.) <b>24.11</b>	Date: <b>6-24-23</b>	Time: <b>1220</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0529</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>381.77</b>	Groundwater Elevation (ft.) <b>372.01</b>	Well Vol. (Gal.) <b>~3.86</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input checked="" type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>87</b> (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
1200	∅	9.76	~297 ml	∅	20.82	6.77	-99	2.31	205	3.14
1205	5	11.24	↓	1.485	19.23	6.64	-110	2.37	99.6	∅
1210	10	13.76	~218 ml	2.575	19.42	6.60	-110	2.37	56.1	∅
1215	15	14.10	↓	3.665	19.49	6.56	-109	2.36	54.2	∅
1220	20	15.20	↓	4.755	19.45	6.56	-109	2.33	58.4	∅
<i>My Own</i>										
For three (3) consecutive Readings		Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable	
Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input type="checkbox"/> Yes <input type="checkbox"/> No				
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1220	15.20	CLEAR	NONE	19.45	2.33	∅	6.56	-109	58.4	

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# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-106S</b>	Total Depth (ft.) <b>41.51</b>	Initial Depth to Water (ft.) <b>22.75</b>	Height of Water Column (ft.) <b>18.76</b>	Date: <b>6-24-23</b>	Time: <b>1130</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0527</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>387.26</b>	Groundwater Elevation (ft.) <b>364.51</b>	Well Vol. (Gal.) <b>~3.0</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input checked="" type="checkbox"/> <sup>SUNNY</sup> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>83</b> (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
1045	∅	22.75	~265 N	∅	21.73	7.20	110	1.42	85.7	2.79
1050	5	24.00		1.325	17.05	7.23	-134	1.80	18.2	0.18
1055	10	24.73		2.65	16.64	6.80	-91	1.77	13.8	∅
1100	15	25.00		3.975	16.52	6.80	-93	1.75	13.9	∅
1105	20	25.10		5.3	16.13	6.79	-91	1.71	8.3	∅
1110	25	25.30		6.625	16.20	6.76	-95	1.64	5.8	∅
1115	30	25.40		7.95	16.18	6.77	-96	1.58	5.6	∅
1120	35	25.40		9.275	16.11	6.77	-98	1.55	4.4	∅
1125	40	25.45		10.6	16.09	6.77	-99	1.53	4.5	∅
1130	45	25.50	↓	11.925	16.00	6.77	-101	1.49	3.9	∅
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No			Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1130	25.50	CLEAR	NONE	16.00	1.49	∅	6.77	-101	3.9	



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# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-106D</b>	Total Depth (ft.) <b>66.08</b>	Initial Depth to Water (ft.) <b>26.12</b>	Height of Water Column (ft.) <b>39.96</b>	Date: <b>6-24-23</b>	Time: <b>1000</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0528</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>387.88</b>	Groundwater Elevation (ft.) <b>361.76</b>	Well Vol. (Gal.) <b>~6.39</b>	PO # <b>-</b>

Rain 
  Sleet/Freezing Rain 
  Snow 
  Fog 
  <sup>SUNNY</sup> Clear 
  Partly Cloudy 
  Windy 
 Temp. **76** (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L	
0900	∅	26.12	~236 ml	∅	18.86	7.19	-66	0.684	179	3.36	
0905	5	28.10	↓	1.18	18.96	7.21	-121	0.726	199	0.40	
0910	10	28.90		2.76	18.87	7.26	-141	0.728	67.3	∅	
0915	15	30.88		3.54	18.80	7.28	-144	0.728	50.2	∅	
0920	20	31.80		4.72	18.78	7.29	-144	0.723	49.4	∅	
0925	25	32.43		5.90	18.75	7.29	-142	0.699	35.3	∅	
0930	30	32.77		7.08	18.79	7.30	-136	0.677	39.2	∅	
0935	35	33.10		~186 ml	8.01	18.82	7.29	-135	0.677	35.6	∅
0940	40	33.38		8.94	18.94	7.27	-127	0.656	26.1	∅	
0945	45	33.80	9.87	18.98	7.29	-120	0.630	25.2	∅		

adj. to 10 min time

For three (3) consecutive Readings

Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
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Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Field Blank Collected	Duplicated Collected
OK	OK	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	Casing PVC <input checked="" type="checkbox"/>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
		<input type="checkbox"/> No	<input type="checkbox"/> No	Filtered:	Time:	Time: 1030
				<input type="checkbox"/> Yes <input type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual
					With:	<input type="checkbox"/> Yes <input type="checkbox"/> No

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1000	34.67	CLEAR	NONE	19.04	0.615	∅	7.26	-106	16.7



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# CCR GROUNDWATER FIELD LOG

# GREEN LANDFILL

Site Name: <b>Green LF</b>	Well No. <b>MW-106D</b>	Total Depth (ft.)	Initial Depth to Water (ft.) <b>26.12</b>	Height of Water Column (ft.)	Date: <b>6-24-23</b>	Time:				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0528</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.)	Groundwater Elevation (ft.)	Well Vol. (Gal.)	PO #				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. _____ (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
0950	50	33.95	~186 mL	10.8	19.01	7.29	-112	0.617	17.0	∅
0955	55	34.25	↓	11.73	19.02	7.26	-108	0.615	17.3	∅
1000	60	34.67	↓	12.66	19.04	7.26	-106	0.615	16.7	∅
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% unless <0.5mg/l stable
Well Condition	Pad Condition	Lock Functioning <input type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input type="checkbox"/> No Time:	Duplicated Collected <input type="checkbox"/> Yes <input type="checkbox"/> No Time:		Semi-Annual <input type="checkbox"/> Yes <input type="checkbox"/> No		
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	



## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-1</b>	Total Depth (ft.) <b>45.53</b>	Initial Depth to Water (ft.) <b>21.19</b>	Height of Water Column (ft.) <b>24.34</b>	Date: <b>11/7/22</b>	Time: <b>1555</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9625</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16	Measuring Point (ft.) <del>423-23-EB</del> <b>422.56</b>	Groundwater Elevation (ft.) <b>401.37</b>	Well Vol. (Gal.) <b>~17.12</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy    Temp. <b>70.5</b> (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
1535	5	21.53	150	0	18.69	6.98	-60	0.556	1.86	3.03
1540	5	22.10	150	0.75	17.25	6.72	-129	0.564	0.70	∅
1545	10	22.46	150	1.5	17.36	6.72	-133	0.564	0.64	∅
1550	15	22.83	150	2.25	17.30	6.76	-138	0.564	0.66	∅
1555	20	23.06	150	3.0	17.26	6.78	-140	0.564	0.35	∅
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <b>N/A</b>	Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <b>N/A</b>			
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample With: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <b>N/A</b>	Semi-Annual <input type="checkbox"/> Yes <input type="checkbox"/> No	Time: <b>N/A</b>			
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity (NTU)	
1555	23.06	Clear	None	17.26	0.564	∅	6.78	-140	0.35	



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# Groundwater Field Log

# Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-2</b>	Total Depth (ft.) <b>50.27</b>	Initial Depth to Water (ft.) <b>23.17</b>	Height of Water Column (ft.) <b>27.10</b>	Date: <b>11/7/23</b>	Time: <b>1500</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9630</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>EB</b> <del>392.37</del> <b>391.82</b>	Groundwater Elevation (ft.) <b>368.65</b>	Well Vol. (Gal.) <b>~17.69</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70s (F°)</b>										
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)
1420	0	23.82	200	0	18.53	1.05	1.55	6.53	-97	6.08
1425	5	24.41	200	1	18.29	1.12	0.21	6.44	-112	4.43
1430	10	24.81	200	2	18.47	1.12	0.20	6.48	-116	3.56
1435	15	25.28	200	3	18.32	1.11	0.82	6.44	-109	3.09
1440	20	25.71	200	4	18.23	1.11	0.56	6.43	-106	2.65
1445	25	26.21	200	5	18.47	1.14	0.90	6.41	-106	2.13
1450	30	26.80	200	6	17.00	1.09	0.19	6.40	-104	1.73
1455	35	27.39	200	7	16.74	1.12	0.05	6.44	-108	4.56
1500	40	28.29	200	8	16.71	1.10	0	6.46	-109	3.13
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input type="checkbox"/>			
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1500	28.29	Clear	None	16.71	1.10	0	6.46	-109	3.13	



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# Groundwater Field Log

# Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-3A</b>	Total Depth (ft.) <b>41.30</b>	Initial Depth to Water (ft.) <b>19.20</b>	Height of Water Column (ft.) <b>22.10</b>	Date: <b>11/8/23</b>	Time: <b>1010</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8003-6430</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16	Measuring Point (ft.) <del>386.48</del> <b>EB</b> <b>386.27</b>	Groundwater Elevation (ft.) <b>367.07</b>	Well Vol. (Gal.) <b>~14.43</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy    Temp. <b>70s</b> (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)
0950	∅	19.64	200	∅	17.47	4.38	4.67	6.59	-62	0.84
0955	5	19.90	200	1	17.00	4.37	∅	6.54	-55	0.50
1000	10	20.12	200	2	16.70	4.39	∅	6.51	-43	0.57
1005	15	20.21	200	3	16.61	4.39	∅	6.49	-44	0.43
1010	20	20.29	200	4	16.62	4.39	∅	6.48	-42	0.52
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 <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>		<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input checked="" type="checkbox"/> Duplicated Collected Time: <b>1030</b>	
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		With: <b>N/A</b>		Semi-Annual <input type="checkbox"/>	
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1010	20.29	Clear	None	16.62	4.39	∅	6.48	-42	0.52	

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## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-4</b>	Total Depth (ft.) <b>33.13</b>	Initial Depth to Water (ft.) <b>28.83</b>	Height of Water Column (ft.) <b>4.3</b>	Date: <b>11/7/23</b>	Time: <b>1025</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9628</b>	Casing Diameter <del>4"</del> <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>EB</b> <del>391.33</del> <b>391.11</b>	Groundwater Elevation (ft.) <b>362.28</b>	Well Vol. (Gal.) <b>~2.81</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70s</b> (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)
0930	0	28.95	125	0	17.68	3.39	7.83	6.30	80	7.44
0935	5	29.01	125	0.625	17.31	3.48	2.64	6.38	6	4.57
0940	10	29.10	125	1.25	16.92	3.51	1.22	6.40	8	2.54
0945	15	29.17	125	1.875	17.06	3.51	0.97	6.41	23	0.95
0950	20	29.19	125	2.5	17.16	3.50	1.01	6.40	41	0.35
0955	25	29.23	125	3.125	17.27	3.52	1.12	6.38	62	0.68
1000	30	29.25	125	3.75	17.36	3.50	1.10	6.37	75	1.26
1005	35	29.28	125	4.375	17.48	3.49	1.13	6.35	89	0.98
1010	40	29.30	125	5.0	17.56	3.49	1.17	6.36	106	0.48
1015	45	29.33	125	5.625	17.70	3.49	1.15	6.33	117	0.65
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 <b>Lid hinge broken</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	<input type="checkbox"/> Duplicated Collected <b>N/A</b> Time:	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:	Semi-Annual <input type="checkbox"/>	
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1025	29.33	Clear	None	17.44	3.48	1.14	6.32	127	0.45	

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## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-4</b>	Total Depth (ft.) <b>33.13</b>	Initial Depth to Water (ft.) <b>28.83</b>	Height of Water Column (ft.) <b>4.3</b>	Date: <b>11/7/23</b>	Time: <b>1025</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9628</b>	Casing Diameter <b>2"</b> <input type="checkbox"/> 2" Conversion fact. <b>4"-0.67    2"-0.16</b>	Measuring Point (ft.) <b>391.33</b> <sup>EB</sup> <b>391.11</b>	Groundwater Elevation (ft.) <b>362.28</b>	Well Vol. (Gal.) <b>~2.81</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy   Temp. <b>70.5</b> (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	50	29.33	125	6.25	17.84	3.48	1.16	6.34	124	0.42
1025	55	29.33	125	6.875	17.94	3.48	1.14	6.32	127	0.45
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 <b>Lid hinge broken</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <input type="checkbox"/>		<input type="checkbox"/> Duplicated Collected <b>N/A</b> Time: <input type="checkbox"/> Semi-Annual	
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1025	29.33	Clear	None	17.94	3.48	1.14	6.32	127	0.45	

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-5</b>	Total Depth (ft.) <b>27.48</b>	Initial Depth to Water (ft.) <b>15.28</b>	Height of Water Column (ft.) <b>12.2</b>	Date: <b>11/7/23</b>	Time: <b>0845</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9627</b>	Casing Diameter <input checked="" type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67    2"-0.16	Measuring Point (ft.) <b>EO</b> <del>390.18</del> <b>389.81</b>	Groundwater Elevation (ft.) <b>374.53</b>	Well Vol. (Gal.) <b>~7.96</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy    Temp. <b>65°</b> (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)
0810	∅	16.15	150	∅	15.69	3.32	1.55	5.97	-88	0.94
0815	5	16.46	150	0.75	15.40	3.34	∅	6.16	-81	0.24
0820	10	16.69	150	1.5	15.57	3.37	∅	6.24	-68	0.17
0825	15	16.99	150	2.25	15.76	3.39	∅	6.27	-49	0.06
0830	20	17.26	150	3.0	15.81	3.40	∅	6.30	-39	0.04
0835	25	17.61	150	3.75	15.90	3.42	∅	6.32	-30	∅
0840	30	17.88	150	4.5	15.96	<del>3.43</del>	∅	6.34	-26	0.01
0845	35	18.00	150	5.25	16.10	3.44	∅	6.36	-21	∅
<i>Eric P. [Signature]</i>										
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected <b>N/A</b> Time:			
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <b>N/A</b>		<input type="checkbox"/> Semi-Annual			
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
0845	18.00	Clear	None	16.10	3.44	∅	6.36	-21	∅	



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# Groundwater Field Log

# Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-6</b>	Total Depth (ft.) <b>45.47</b>	Initial Depth to Water (ft.) <b>21.72</b>	Height of Water Column (ft.) <b>23.75</b>	Date: <b>11/8/23</b>	Time: <b>0905</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9626</b>	Casing Diameter <del>4"</del> <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>388.17</del> <sup>60</sup> <b>388.10</b>	Groundwater Elevation (ft.) <b>366.38</b>	Well Vol. (Gal.) <b>~15.50</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70.5</b> (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)
0815	∅	21.82	200	∅	17.85	2.60	7.11	6.01	152	2.02
0820	5	21.82	200	1	17.03	2.89	1.16	6.18	-22	3.35
0825	10	21.83	200	2	16.94	2.94	0.31	6.25	4	3.12
0830	15	21.83	200	3	16.98	2.96	0.08	6.27	21	0.68
0835	20	21.80	200	4	17.01	2.97	∅	6.30	35	0.92
0840	25	21.82	200	5	17.08	2.98	∅	6.31	41	1.03
0845	30	21.80	200	6	17.14	2.99	∅	6.33	51	0.94
0850	35	21.81	200	7	17.18	2.99	∅	6.33	57	0.92
0855	40	21.80	200	8	17.22	2.99	∅	6.32	66	0.67
0900	45	21.79	200	9	17.28	2.99	∅	6.33	71	1.54
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 <input type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected		<input type="checkbox"/> Duplicated Collected			
				Casing PVC <input checked="" type="checkbox"/>	Time: <b>0915</b>	Time: <b>N/A</b>				
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input type="checkbox"/>				
				With: <b>N/A</b>						
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity (NTU)	
0905	21.81	Clear	None	17.37	2.99	∅	6.34	75	0.76	

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-6</b>	Total Depth (ft.) <b>45.47</b>	Initial Depth to Water (ft.) <b>21.72</b>	Height of Water Column (ft.) <b>23.75</b>	Date: <b>11/8/23</b>	Time: <b>0905</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8002-9626</b>	Casing Diameter <del>4"</del> <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <del>388.17</del> <sup>EB</sup> <b>388.10</b>	Groundwater Elevation (ft.) <b>366.38</b>	Well Vol. (Gal.) <b>~15.50</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70s</b> (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)
<b>0905</b>	<b>50</b>	<b>21.81</b>	<b>200</b>	<b>10</b>	<b>17.37</b>	<b>2.99</b>	<b>∅</b>	<b>6.34</b>	<b>75</b>	<b>0.76</b>
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 <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected Time: <b>0915</b>	<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input type="checkbox"/> No With:		<input type="checkbox"/> Semi-Annual			
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
<b>0905</b>	<b>21.81</b>	<b>Clear</b>	<b>None</b>	<b>17.37</b>	<b>2.99</b>	<b>∅</b>	<b>6.34</b>	<b>75</b>	<b>0.76</b>	



## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-104</b>	Total Depth (ft.) <b>60.84</b>	Initial Depth to Water (ft.) <b>25.83</b>	Height of Water Column (ft.) <b>35.01</b>	Date: <b>11/7/23</b>	Time: <b>1125</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8007-1139</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>EO</b> <del>395.4</del> <b>395.40</b>	Groundwater Elevation (ft.) <b>369.57</b>	Well Vol. (Gal.) <b>~5.71</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70</b> (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)
1105	0	27.57	250	0	18.52	4.77	7.53	6.55	14	4.29
1110	5	28.50	250	1.25	17.32	4.86	0.21	6.44	2	1.98
1115	10	29.97	250	2.5	17.10	4.84	0.02	6.39	-11	1.03
1120	15	30.64	200	3.5	17.31	4.83	0	6.38	-13	0.58
1125	20	31.32	200	4.5	17.28	4.82	0	6.35	-11	1.04
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	With: <b>N/A</b>			
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1125	31.32	Clear	N <sub>2</sub>	17.28	4.82	0	6.35	-11	1.04	

pg 1 of 2

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-105</b>	Total Depth (ft.) <b>33.87</b>	Initial Depth to Water (ft.) <b>10.79'</b>	Height of Water Column (ft.) <b>23.08</b>	Date: <b>11/8/23</b>	Time: <b>1155</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0529</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 8" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>381.77</b>	Groundwater Elevation (ft.) <b>370.98</b>	Well Vol. (Gal.) <b>~3.77</b>	PO # <b>✓</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70s</b> (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)
1105	0	12.66	100	0	19.04	1.60	1.45	6.40	-115	56.1
1110	5	13.65	100	0.5	18.64	1.63	0	6.40	-133	48.7
1115	10	14.58	100	2.0	19.53	1.61	0	6.38	-138	26.2
1120	15	15.13	100	1.5	19.37	1.60	0	6.38	-141	16.6
1125	20	15.80	100	2.0	19.48	1.58	0	6.34	-145	14.6
1130	25	16.41	100	2.5	19.50	1.55	0	6.32	-144	12.9
1135	30	17.08	100	3.0	19.66	1.54	0	6.27	-142	9.87
1140	35	17.63	100	3.5	19.71	1.54	0	6.24	-139	8.40
1145	40	18.06	100	4.0	19.70	1.53	0	6.21	-137	7.45
1150	45	18.54	100	4.5	20.02	1.52	0	6.21	-136	7.34
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
<b>Good</b>	<b>Good</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <b>N/A</b>		<input type="checkbox"/> Semi-Annual			
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1155	19.02	Clear	None	20.06	1.51	0	6.22	-136	6.71	

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-105</b>	Total Depth (ft.) <b>33.87</b>	Initial Depth to Water (ft.) <b>10.79</b>	Height of Water Column (ft.) <b>23.08</b>	Date: <b>11/8/23</b>	Time: <b>1155</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0529</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>381.77</b>	Groundwater Elevation (ft.) <b>370.98</b>	Well Vol. (Gal.) <b>~3.77</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70s</b> (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)
1155	50	19.02	100	5.0	20.06	1.51	∅	6.22	-136	6.71
<i>[Handwritten Signature]</i>										
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 <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>		<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>	
<b>Good</b>	<b>Good</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		With: <b>N/A</b>		<input type="checkbox"/> Semi-Annual	
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1155	19.02	Clear	None	20.06	1.51	∅	6.22	-136	6.71	

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-1065</b>	Total Depth (ft.) <b>41.51</b>	Initial Depth to Water (ft.) <b>23.50</b>	Height of Water Column (ft.) <b>18.01</b>	Date: <b>11/7/23</b>	Time: <b>1400</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0527</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>387.26</b>	Groundwater Elevation (ft.) <b>363.76</b>	Well Vol. (Gal.) <del>4</del> <b>-2.94</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Windy Temp. <b>70s</b> (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)
1315	0	25.28	200	1	17.22	0.953	3.81	6.77	-149	20.5
1320	5	25.50	200	1	17.66	0.984	6.40	6.70	-151	10.2
1325	10	25.50	200	2	18.54	0.861	0.77	6.65	-150	7.42
1330	15	25.60	200	3	18.50	0.957	6.97	6.68	-151	6.93
1335	20	25.66	200	4	18.50	0.881	2.43	6.65	-149	7.73
1340	25	25.76	200	5	18.44	0.894	2.30	6.67	-146	9.22
1345	30	25.98	200	6	17.87	0.862	0	6.67	-148	10.2
1350	35	26.13	200	7	17.80	0.836	0	6.69	-152	9.08
1355	40	26.18	200	8	17.84	0.822	0	6.69	-153	10.2
1400	45	26.23	200	9	17.75	0.815	0	6.69	-155	8.51
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <b>N/A</b>		<input type="checkbox"/> Semi-Annual			
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1400	26.23	Clear	None	17.75	0.815	0	6.69	-155	8.51	

DO see below

Note: Fluctuations of DO caused by loose compression nut pulling air in line Nut tightened at 1343.

## Groundwater Field Log

## Green Landfill

Site Name: <b>Green LF</b>	Well No. <b>MW-106D</b>	Total Depth (ft.) <b>66.08</b>	Initial Depth to Water (ft.) <b>26.44</b>	Height of Water Column (ft.) <b>39.64</b>	Date: <b>11/7/23</b>	Time: <b>1305</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8008-0528</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>387.88</b>	Groundwater Elevation (ft.) <b>361.44</b>	Well Vol. (Gal.) <b>~6.47</b>	PO # <b>-</b>

Rain  Sleet/Freezing Rain  Snow  Fog  Clear  Partly Cloudy  Windy Temp. **70s** (F°)

EB  
11/7/23

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)
<del>1230</del> 1230	<del>0</del> 0	28.53	200	<del>0</del> 0	21.59	0.480	1.45	6.80	-176	11.7
<del>1235</del> 1235	<del>5</del> 5	29.94	200	<del>1</del> 1	18.63	0.511	7.24	7.15	-215	3.57
<del>1240</del> 1240	<del>10</del> 10	31.72	200	<del>2</del> 2	17.97	.572	6.63	7.18	-210	1.95
<del>1245</del> 1245	<del>15</del> 15	33.41	200	<del>3</del> 3	17.89	.493	5.99	7.14	-200	1.07
1250	20	34.70	200	4	17.69	0.450	5.64	7.10	-170	1.28
1255	25	36.16	200	5	17.58	0.443	<del>3.72</del>	7.10	-158	0.57
1300	30	37.46	200	6	17.55	0.433	<del>0</del>	7.07	-154	1.16
1305	35	38.76	200	7	17.45	0.430	<del>0</del>	7.07	-151	0.29

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
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Well Condition <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	<input type="checkbox"/> Duplicated Collected <b>N/A</b> Time: <input type="checkbox"/> Semi-Annual
Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With: <b>N/A</b>				

Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1305	38.76	Clear	None	17.45	0.430	<del>0</del>	7.07	<del>-158</del> -151	0.29

**APPENDIX B - GREEN SURFACE IMPOUNDMENT FIELD  
SAMPLING FORMS**

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Auto-Cal: 6/25/2023

PH: 3.97 SU  
 Cond: 4.57 mS/cm  
 Turb: 4.0 NTU  
 DO: 8.29 mg/L  
 NR

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

①

# CCR GROUNDWATER FIELD LOG

# GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-11</b>	Total Depth (ft.) <b>49.9</b>	Initial Depth to Water (ft.) <b>22.40</b>	Height of Water Column (ft.) <b>27.5</b>	Date: <b>6/25/2023</b>	Time: <b>0755</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3938</b>	Casing Diameter □ 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>401.32</b>	Groundwater Elevation (ft.) <b>378.92</b>	Well Vol. (Gal.) <b>4.4</b>	PO # <b>-</b>

Rain  
  Sleet/Freezing Rain  
  Snow  
  Fog  
  Clear  
 Partly Cloudy  
 Windy  
 Temp. **75** (F°)

Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO Mg/L
0725	∅	22.40	~164 ml	∅	19.50	5.65	225	7.82	∅	2.91
0730	5	22.70	↓	0.82	18.88	6.15	215	7.80	∅	2.06
0735	10	22.82		1.64	18.02	6.65	104	6.52	∅	0.48
0740	15	22.85		2.46	17.63	6.85	-41	5.71	∅	∅
0745	20	22.90		3.28	17.54	6.86	-50	5.65	∅	∅
0750	25	22.87		4.10	17.52	6.87	-57	5.61	∅	∅
0755	30	22.85		4.92	17.49	6.87	-59	5.61	∅	∅
<i>John Dent</i>										

For three (3) consecutive Readings	Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
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Well Condition <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time:	Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time:
				Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:	Semi-Annual <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
0755	22.85	CLEAR	NONE	17.49	5.61	∅	6.87	-59	∅



④ Field Blank @ 1145

# CCR GROUNDWATER FIELD LOG @ 1145 GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-12</b>	Total Depth (ft.) <b>72.0</b>	Initial Depth to Water (ft.) <b>28.20</b>	Height of Water Column (ft.) <b>43.8</b>	Date: <b>6-25-23</b>	Time: <b>1120</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3939</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>395.54</b>	Groundwater Elevation (ft.) <b>367.34</b>	Well Vol. (Gal.) <b>7.01</b>	PO # <b>-</b>

Rain  
  Sleet/Freezing Rain  
  Snow  
  Fog  
  Clear  
  Partly Cloudy  
  Windy  
 Temp. **84** (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)
1045	0	28.20	~200 ml	0	33.60	1.02	4.03	6.94	98	0
1050	5	30.70		1	29.42	1.02	7.45	7.10	94	0
1055	10	30.70		2	25.60	0.920	5.52	6.98	-94	0
1100	15	31.00		3	23.57	0.917	0	6.93	-103	0
1105	20	31.85		4	23.37	0.918	0	6.90	-106	0
1110	25	32.25		5	21.50	0.916	0	6.92	-107	0
1115	30	32.64		6	21.57	0.919	0	6.90	-108	0
1120	35	33.10		7	21.55	0.919	0	6.90	-107	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
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Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected Time: <b>1145</b>	<input type="checkbox"/> Duplicated Collected <b>N/A</b> Time:
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	With:	<input checked="" type="checkbox"/> Semi-Annual

Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
1120	33.10	CLEAR	NONE	21.55	0.919	0	6.90	-107	0



# CCR GROUNDWATER FIELD LOG <sup>3</sup>

# GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-13</b>	Total Depth (ft.) <b>51.5</b>	Initial Depth to Water (ft.) <b>22.20</b>	Height of Water Column (ft.) <b>29.3</b>	Date: <b>6-25-23</b>	Time: <b>0930</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3940</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>394.60</b>	Groundwater Elevation (ft.) <b>372.40</b>	Well Vol. (Gal.) <b>~4.69</b>	PO # <b>-</b>

Rain  Sleet/Freezing Rain  Snow  Fog  Clear  Partly Cloudy  Windy Temp. 81 (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)
0910	∅	22.20	~220 ml	∅	21.97	1.22	4.31	7.01	101	∅
0915	5	23.35	↓	1.1	21.49	1.17	3.45	6.78	108	∅
0920	10	24.00		2.2	21.74	1.19	2.89	6.70	112	∅
0925	15	24.32		3.3	21.71	1.17	2.85	6.66	114	∅
0930	20	24.70		4.4	21.70	1.16	2.81	6.65	116	∅
<i>Dry Well</i>										

For three (3) consecutive Readings	Required Purge	Actual Purge	+/- 3% (°C)	+/- 3%	+/- 10% <0.5mg/l stable	+/- .10 (SU)	+/- 10 mV	+/- 10% mass <5 NTU consider stable
------------------------------------	----------------	--------------	-------------	--------	-------------------------	--------------	-----------	-------------------------------------

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected	<input type="checkbox"/> Duplicated Collected
OK	OK	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	Casing PVC <input checked="" type="checkbox"/>	Time: N/A	Time: N/A
		<input type="checkbox"/> No	<input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input checked="" type="checkbox"/>

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU
0930	24.70	CLEAR	NONE	21.70	1.16	2.81	6.65	116	∅

(2) DUPE @ 0900

# CCR GROUNDWATER FIELD LOG

# GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-14</b>	Total Depth (ft.) <b>49.6</b>	Initial Depth to Water (ft.) <b>26.60</b>	Height of Water Column (ft.) <b>23.0</b>	Date: <b>6-25-23</b>	Time: <b>0845</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3941</b>	Casing Diameter 4" <del>2"</del> Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>390.71</b>	Groundwater Elevation (ft.) <b>364.11</b>	Well Vol. (Gal.) <b>3.68</b>	PO # <b>-</b>

Rain  
  Sleet/Freezing Rain  
  Snow  
  Fog  
  Clear  
  Partly Cloudy  
  Windy  
 Temp. **78** (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)
0825	0	26.60	~250 ml	0	19.56	1.67	1.83	7.52	-83	0
0830	5	27.10	↓	1.25	19.06	1.63	0.30	7.09	-76	0
0835	10	27.21		2.50	18.82	1.62	0	6.74	-63	0
0840	15	27.21		3.75	18.80	1.62	0	6.73	-62	0
0845	20	27.24		5.00	18.90	1.63	0	6.69	-60	0
<i>Very Quiet</i>										

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 <b>OK</b>	Pad Condition <b>OK</b>	Lock Functioning <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Bladder Pump <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing SS <input type="checkbox"/> Casing PVC <input checked="" type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>	<input checked="" type="checkbox"/> Duplicated Collected Time: <b>0900</b>
		Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:		<input checked="" type="checkbox"/>	

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
0845	27.24	CLEAR	NONE	18.90	1.63	0	6.69	-60	0

## CCR GROUNDWATER FIELD LOG

## GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-11</b>	Total Depth (ft.) <b>49.9</b>	Initial Depth to Water (ft.) <b>27.43</b>	Height of Water Column (ft.) <b>22.47</b>	Date: <b>11/4/23</b>	Time: <b>1615</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3938</b>	Casing Diameter <input type="checkbox"/> 4" <input type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>401.32</b>	Groundwater Elevation (ft.) <b>373.89</b>	Well Vol. (Gal.) <b>~3.67</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70.5</b> (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	Temp (°C)	pH (SU)	eH/ORP (mV)	Sp. Cond. (mS)	Turbidity (NTU)	DO (Mg/L)
1550	0	27.81	<del>150</del>	0	19.03	7.18	-41	3.38	1.84	2.44
1555	5	27.80	150	0.75	18.58	7.02	-61	3.64	0.88	0.69
1600	10	27.83	150	1.5	18.41	6.93	-73	3.90	0.33	0
1605	15	27.81	150	2.25	18.19	6.85	-81	4.14	0.11	0
1610	20	27.83	150	3.0	18.17	6.80	-83	4.19	0.34	0
1615	25	27.81	150	3.75	18.04	6.81	-85	4.23	0.28	0
For three (3) consecutive Readings			Required Purge	Actual Purge	+/- 3% (°C)	+/- .10 (SU)	+/- 10 mV	+/- 3%	+/- 10% unless <5 NTU consider stable	+/- 10% <0.5mg/l stable
Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	Field Blank Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time: <b>N/A</b>		Duplicated Collected <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Time: <b>N/A</b>		
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No With:		Semi-Annual <input type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1615	27.81	Clear	None	18.04	4.23	0	6.81	-85	0.28	

pg. 1 of 2

## CCR GROUNDWATER FIELD LOG

## GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-12</b>	Total Depth (ft.) <b>72.0</b>	Initial Depth to Water (ft.) <b>31.21</b>	Height of Water Column (ft.) <b>40.79</b>	Date: <b>11/6/23</b>	Time: <b>1525</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3939</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>395.54</b>	Groundwater Elevation (ft.) <b>364.33</b>	Well Vol. (Gal.) <b>~6.67</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70s</b> (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)
1425	0	33.28	200	1+	18.46	0.600	6.36	7.19	-36	15.5
1430	5	34.49	200	1+	17.73	0.616	5.05	7.00	-48	16.8
1435	10	36.45	200	2+	17.37	0.622	3.68	7.00	-55	8.07
1440	15	38.63	200	3+	17.51	0.620	2.40	6.95	-47	3.05
1445	20	41.02	200	4+ (ED)	17.36	0.621	1.46	6.94	-24	2.82
1450	25	42.98	200	5+	17.20	0.626	1.70	6.89	-20	1.30
1455	30	45.19	200	6+	17.18	0.624	1.70	6.94	9	0.96
1500	35	47.50	200	7+	17.15	0.621	2.25	7.03	18	1.67
1505	40	49.57	200	8+	17.18	0.618	2.76	7.17	39	0.59
1510	45	52.24	200	9+	17.05	0.612	3.73	7.14	44	0.65
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 <input type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected Time: <b>1535</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
OK	OK	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Casing PVC <input checked="" type="checkbox"/>	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Semi-Annual <input type="checkbox"/>		
Sample Time	Depth to Water	Color	Odor	Temp. (°C)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)	
1525	54.92	Clear	None	18.47	0.609	4.27	7.33	61	0.65	

\* Spiders in water tubing

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## CCR GROUNDWATER FIELD LOG

## GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-12</b>	Total Depth (ft.) <b>72.0</b>	Initial Depth to Water (ft.) <b>31.21</b>	Height of Water Column (ft.) <b>40.79</b>	Date: <b>11/6/23</b>	Time: <b>1525</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3939</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>395.54</b>	Groundwater Elevation (ft.) <b>364.33</b>	Well Vol. (Gal.) <b>~6.67</b>	PO # <b>-</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy Temp. <b>70s</b> (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)
1515	50	53.39	200	10 ++	17.38	0.610	3.89	7.27	54	0.52
1520	55	54.21	200	11 ++	18.34	0.609	4.12	7.33	57	0.48
1525	60	54.92	200	12 +3	18.47	0.609	4.27	7.33	61	0.65
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 <input type="checkbox"/>	Casing PVC <input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Field Blank Collected	Time: <b>1535</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>	
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	With:		<input type="checkbox"/> 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	54.92	Clear	None	18.47	0.609	4.27	7.33	61	0.65	



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# CCR GROUNDWATER FIELD LOG

# GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-13</b>	Total Depth (ft.) <b>51.5</b>	Initial Depth to Water (ft.) <b>22.99'</b>	Height of Water Column (ft.) <b>28.51</b>	Date: <b>11/6/23</b>	Time: <b>1230</b>				
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3940</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>394.60</b>	Groundwater Elevation (ft.) <b>373.61</b>	Well Vol. (Gal.) <b>~4.65</b>	PO # <b>—</b>				
<input type="checkbox"/> Rain <input type="checkbox"/> Sleet/Freezing Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> Clear <input type="checkbox"/> Partly Cloudy <input checked="" type="checkbox"/> Windy <input checked="" type="checkbox"/> Temp. <b>70's</b> (F°)										
Time	ET (min)	Depth to Water (ft.)	Purge Rate ml/min	Volume Purged (L)	±3% Temp (°C)	Sp. Cond. (mS)	DO Mg/L	±0.1 pH (SU)	±10 eH/ORP (mV)	10% < 5 Turbidity (NTU)
1205	5	32.36	200	1	17.29	0.770	4.23	6.74	23	1.11
1210	5	32.66	200	1	17.92	0.781	2.98	6.75	14	0.70
1215	10	32.64	200	2	18.48	0.812	∅	6.62	3	1.25
1220	15	32.55	200	3	18.38	0.843	∅	6.50	-12	1.83
1225	20	<del>32.43</del> 32.43	200	4	18.33	0.843	∅	6.52	-14	1.50
1230	25	32.29	200	5	18.34	0.843	∅	6.58	-18	1.29
<i>[Signature]</i>										
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 <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected Time: <b>N/A</b>		<input type="checkbox"/> Duplicated Collected Time: <b>N/A</b>			
<b>OK</b>	<b>OK</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Semi-Annual <input type="checkbox"/>			
Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU	
1230	32.29	Clear	None	18.34	0.843	∅	6.58	-18	1.29	





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# CCR GROUNDWATER FIELD LOG

# GREEN ASH POND

Site Name: <b>GREEN POND</b>	Well No. <b>MW-14</b>	Total Depth (ft.) <b>49.6</b>	Initial Depth to Water (ft.) <b>27.72</b>	Height of Water Column (ft.) <b>21.88</b>	Date: <b>11/6/23</b>	Time: <b>1330</b>
Site Location: <b>Webster Co, KY</b>	AKGWA# <b>8006-3941</b>	Casing Diameter <input type="checkbox"/> 4" <input checked="" type="checkbox"/> 2" Conversion fact. 4"-0.67 2"-0.16	Measuring Point (ft.) <b>390.71</b>	Groundwater Elevation (ft.) <b>362.99</b>	Well Vol. (Gal.) <b>~3.57</b>	PO # <b>—</b>

Rain  Sleet/Freezing Rain  Snow  Fog  Clear  Partly Cloudy  Windy Temp. **70<sup>s</sup>** (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)
1305	5	27.72	200	1	19.08	0.950	9.78	6.84	-80	1.23
1310	5	28.37	200	1	18.83	1.01	10.07	6.72	-65	1.11
1315	10	28.48	200	2	18.60	1.01	8.91	6.77	-60	<del>0.99</del> 0.33
1320	15	28.65	200	3	18.51	1.02	8.05	6.70	-59	0.08
1325	20	28.78	200	4	18.45	1.01	7.50	6.68	-57	0.41
1330	25	28.93	200	5	18.47	1.01	8.05	6.70	-56	0.93
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

*[Handwritten Signature]*

Well Condition	Pad Condition	Lock Functioning	Bladder Pump	Casing SS <input type="checkbox"/>	<input type="checkbox"/> Field Blank Collected	<input checked="" type="checkbox"/> Duplicated
OK	OK	<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes	Casing PVC <input checked="" type="checkbox"/>	Time: <b>N/A</b>	Collected Time: <b>1345</b>
		<input type="checkbox"/> No	<input type="checkbox"/> No	Filtered: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Split Sample <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Semi-Annual <input type="checkbox"/>

Sample Time	Depth to Water	Color	Odor	Temp. (C°)	Sp. Cond. (mS)	DO (mg/L)	pH (SU)	eH/ORP (mV)	Turbidity NTU)
1330	28.93	Clear	None	18.47	1.01	8.05	6.70	-56	0.93



**APPENDIX C - MONITORING WELL CONSTRUCTION PROGRESS  
REPORT (GREEN LANDFILL)**

---



# Monitoring Well Construction Progress Report



## **Big Rivers Electric Corporation**

**Sebree Station  
Green Landfill  
Agency Interest No. 4169  
Project No. 156465**

**6/9/2023**



# **Monitoring Well Construction Progress Report**

prepared for

**Big Rivers Electric Corporation  
Sebree Station  
Green Landfill  
Sebree, Kentucky**

**Agency Interest No. 4169  
Project No. 156465**

**6/9/2023**

prepared by

**Burns & McDonnell  
Kansas City, Missouri**

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## LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
amsl	above mean sea level
bgs	below ground surface
BREC	Big Rivers Electric Corporation
bTOC	below top of casing
Cascade	Cascade Environmental, LP.
CFR	Code of Federal Regulations
CCR	coal-combustion residuals
Facility/Site	Big Rivers Electric Corporation's Sebree Generating Station, Green Landfill at Webster County, Robards, Kentucky
feet	ft
FMSME	Fuller, Mossbarger, Scott & May Engineers, Inc.
GWAP	<i>2021 Groundwater Assessment Plan</i>
HASP	Health and Safety Plan
IDW	investigation-derived waste
KAR	Kentucky Administrative Regulation
KDEP	Kentucky Department of Environmental Protection
KDWM	Kentucky Department of Environmental Protection, Division of Waste Management
MW	Monitoring Well
Report	<i>Monitoring Network Construction Progress Report</i>
Work Plan	<i>2023 Monitoring Well Installation Work Plan</i>

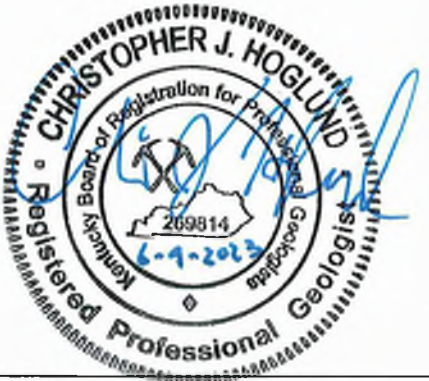
### CERTIFICATION

I, Chris Hogle, certify that I am a qualified groundwater scientist, 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 judgements regarding groundwater and contaminant fate and transport.

I further certify that this report, with all its component elements, was prepared by myself or under my direction.

Chris Hogle  
KY Registered Professional Geologist No. 269814  
Burns & McDonnell Engineering Company, Inc.  
9400 Ward Parkway  
Kansas City, MO 64114

Monitoring Well Construction Progress Report  
June 9, 2023  
Sebree Station  
Green Landfill  
Webster County, Robards, Kentucky  
Agency Interest No. 4196



Signature

6/9/2023

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 three (3) additional groundwater monitoring wells at the BREC Sebree Generating Station Green Landfill located in Webster County, Robards, Kentucky (Site/Facility). A Site location map and well location map are provided as **Figures 1 and 2**, respectively.

### 1.1 Purpose

At the request of BREC, additional groundwater monitoring wells were installed in accordance with Title 401 of the Kentucky Administrative Regulations (KAR) Chapter 6 Part 350. The monitoring well installation activities were performed in general accordance with the protocols and procedures specified in the Kentucky Department of Environmental Protection (KDWP), Division of Waste Management (KDWM) approved *2023 Monitoring Well Installation Work Plan* (Work Plan; Burns & McDonnell, 2023a). This Report for monitoring well construction and installation was prepared as required by Green Landfill permit conditions GSTR0001 and GSTR0003. A copy of the KDWM approval letter and Green Landfill permit is provided in **Appendix A**.

The newly installed groundwater monitoring wells will serve as characterization wells in the established coal-combustion residual (CCR) groundwater monitoring program at the Site to support compliance with the requirements included in the Title 401 KAR Chapter 46 CCR (401 KAR 46) that follows the United States Environmental Protection Agency *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, 40 Code of Federal Regulations (CFR) Part 257 and 261* and in accordance with 40 CFR §257.90, collectively referred to herein as the “CCR Final Rule”.

### 1.2 Report Outline

The Report has been prepared to provide a summary of the groundwater monitoring wells installed at the Site.

This Report includes the following:

- Site Background – Section 2.0
- Monitoring Well Installation Activities – Section 3.0
- References – Section 4.0

- KDWM Work Plan Approval Letter and Revised Green Landfill Permit – Included in **Appendix A**
- BREC 10-Day Notification Letter to KDWM – Included in **Appendix B**
- Field Photographs – Included as **Appendix C**
- Kentucky Monitoring Well Variance Request – Included in **Appendix D**
- Field Logbook – Included as **Appendix E**
- Drill Logs – Included as **Appendix F**
- Monitoring Well Construction Diagrams – Included as **Appendix G**
- Uniform Kentucky Well Construction Record – Included as **Appendix H**
- Monitoring Well Development Forms – Included as **Appendix I**
- Monitoring Well Survey Report – Included as **Appendix J**



## 2.0 SITE BACKGROUND

### 2.1 Site Location and Description

BREC owns and operates Sebree Station, which is a power generating facility located on the Green River northeast of Sebree, Kentucky. Sebree Station is composed of Green Station and Reid/Henderson Municipal Power & Light (HMP&L) Station. The Sebree Station is bounded by Interstate-69 to the west and the Green River to the east (see **Figure 1**). Reid Unit 1 (65 Megawatts [MW]) began commercial operation in 1966 and was retired in 2020. The Reid Combustion Turbine (65 MW) was commercialized in 1976. HMP&L Station 2, Units 1 (167 MW) and 2 (168 MW) began commercial operation in 1973 and 1974 respectively. Both HMP&L units were retired as of February 1, 2019. Green Station Units 1 (250 MW) and 2 (242 MW) began commercial operation as coal-fired units in 1979 and 1981, respectively. Both Green units were converted to natural gas-fired boilers in the second quarter of 2022.

The location of the Green Landfill is illustrated in **Figure 1**. The Green Landfill is located directly south of Sebree Station, situated directly south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that received special waste generated by burning coal (CCRs) from Green Station and Reid/HMP&L Stations (retired in 2019 and 2020). The landfill began receiving CCR waste in 1980 and currently receives CCR material generated from ash pond closure activities, which are scheduled to continue through April 2024. In December 2021, the Green Landfill was converted from a Special Waste Landfill (ACTV0004) to a CCR Unit – Landfill (ACTV0007) as governed by the 40 CFR Part 257. The current Green Landfill footprint is approximately 170 acres.

The Green Landfill is located on an upland adjacent to the west bank of the Green River at an elevation of approximately 436 feet above mean sea level (amsl) at the north end of the landfill and 397 feet amsl at the south end of the landfill. Overland flow surface runoff from precipitation falling within the Green Landfill is diverted to ponds in the north and south sides of the landfill and then discharged to the Green River under Kentucky Pollution Discharge and Elimination System permit.

### 2.2 Geology

The Green Landfill lies 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 and alluvial deposits, underlain by Upper to Middle Pennsylvanian-age clastic and carbonate bedrock consisting primarily of sandstone and shale. The unconsolidated materials also include

fill, silty and clayey residuum, and minor amounts of sandy, clayey channel fill alluvium. The bedrock is comprised of the Upper Pennsylvanian Shelburn Formation (formerly identified as the Lisman Formation [Fairer, 1973]) and the Middle Pennsylvanian Carbondale Formation. At the base of the Shelburn Formation is the Providence Limestone Member, consisting of limestone and interbedded shale, but this geologic unit is absent in much of the area due to erosional channeling. Due to its discontinuous character and the presence of interbedded shale, hydrologically significant karst features are not present in the Providence Limestone Member. The underlying 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 this depositional environment, the sandstone/siltstone 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 Existing Monitoring Well Network**

Monitoring wells were installed at the Green Landfill beginning in November 1996 prior to the implementation of the CCR Rule. However, the existing wells meet the requirements of Title 40 CFR Section 257.90 of the CCR Rule for installation of a groundwater monitoring system. These regulations require that monitoring wells adequately represent the quality of background groundwater and groundwater representing the downgradient waste boundary. The existing wells are located along the perimeter of the landfill footprint. One upgradient monitoring well (MW-1) and five downgradient monitoring wells (MW-2, MW-3A, MW-4, MW-5 and MW-6) were installed at the landfill to determine the general direction of groundwater movement and to monitor groundwater impacts. A map illustrating the location of all program monitoring wells is presented as **Figure 2**.

### 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 KDWM-approved Work Plan:

- Advanced three (3) borings to be completed with monitoring wells at three (3) locations.
- Developed monitoring wells.
- Conducted surveying of newly installed monitoring wells.

The monitoring well locations are illustrated in **Figure 2**. The general approach and results of field activities is presented below. These new groundwater monitoring wells will be included as characterization wells in the established CCR groundwater monitoring program at the Site in accordance with CCR Final Rule.

#### 3.1 Pre-Investigation Activities

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

##### 3.1.1 Health and Safety Plan

A Site-specific HASP (Burns & McDonnell, 2023b) was developed and implemented during the well installation field activities. The HASP complies with applicable Occupational Safety and Health Administration 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 Green 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 and contracted a private utility locator to further mark/clear utilities in the vicinity of the new monitoring wells.

### 3.1.4 KDWM Notification

In accordance with 401 KAR 6:350 Section 12 and the landfill permit (GSTR003), BREC provided the KDWM at least 10 days' notice prior to monitoring well construction and abandonment activities associated with the KDWM-approved Work Plan. Notification was provided via a letter dated April 5, 2023. A copy of the notification letter is provided in **Appendix B**. A member of the KDWM was present from the start of the field activities and observed drilling and construction of Monitoring Well MW-105.

## 3.2 Monitoring Well Installation

Three (3) new monitoring wells were installed as characterization monitoring wells at the Green Landfill in accordance with 401 KAR 6:350 and included Monitoring Wells MW-105, MW-106S, and MW-106D (**Figure 2**). Monitoring wells were installed at locations illustrated in **Figure 2** and consisted of a single well (MW-105) at one (1) location north of existing Monitoring Well MW-2 and two wells (MW-106S and MW-106D) clustered near each other at one (1) location (each in separate boreholes) south of MW-2. Monitoring well installation activities were conducted from April 24<sup>th</sup>, 2023- April 28<sup>th</sup> 2023.

### 3.2.1 Drilling Activities

Roto-sonic drilling and well construction/installation 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.

Two (2) monitoring wells, MW-105 and MW-106S, were completed in unconsolidated overburden and MW-106D was completed in sandstone. Roto-sonic drilling was used for continuous soil/bedrock sampling by advancing through the subsurface using a 4-1/4-inch sonic core barrel that was sequentially overridden by a 6-inch diameter temporary steel drill casing (telescoping one casing over another; 4"x 6" sonic drilling system). In accordance with the Work Plan at Monitoring Well MW-106S and MW-106D, an additional 7-inch diameter outer drill casing was used to sequentially override the 6-inch override casing through the overburden and 3-feet into bedrock (MW-106D) resulting in an approximate 8-inch diameter borehole. Photos of the typical drilling activities are included in **Appendix C**.

#### 3.2.1.1 Variance Request

Prior to drilling, verbal approval was obtained from both the KDWM and Division of Water to use Thread Armour TJC<sup>®</sup> by Hole Products as a pipe thread lubricant on the drill rod casing joints during drilling of monitoring wells. A Kentucky Monitoring Well Variance Request form was submitted and approved by the Division of Water on April 20, 2023, a copy of which is included in **Appendix D**.

### 3.2.2 Geology Encountered

The retrieved continuous soil/bedrock samples from roto-sonic drilling were examined by the field geologist. 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**. Bedrock cores recovered during roto-sonic drilling at MW-106D were placed in labeled wooden core boxes stored at the Facility by BREC personnel. Photos of the recovered soil and bedrock from each monitoring well location are included in **Appendix C**.

The upper 12-17 feet of overburden consisted of a yellowish-brown to brown clay, with-some silt, trace-some fine sand, medium-high plasticity, medium to high stiffness, and trace to some iron-oxide staining. Between 17-32 feet bgs the color of the overburden clay changed to very dark gray to grayish brown. An approximate 3-foot thick transition zone was observed above bedrock comprised of gravel with-some fine sand and trace-some silt and clay.

Bedrock was encountered in Monitoring Wells MW-105 (31-feet bgs) and MW-106D (42-feet bgs) consisting of sandstone and interbedded sandstone and shale, respectively. The uppermost portion of the bedrock was weathered with sandstones comprised of very fine to fine grained sand, poorly graded, micaceous, with iron staining, pyritic (MW-106D), tan in color, and weakly cemented (broke easily). The weathered shale was observed with bluish grey color. At Monitoring Well MW-106D, the weathered bedrock transitioned to more indurated/resistant, unweathered gray sandstone and dark gray to black shale (fissile, organic-rich) at 48 feet bgs. Beneath the gray sandstone was a dark gray to black, organic-rich shale with some fine-grain sandstone interbeds/laminations of unknown thickness.

### 3.2.3 Monitoring Well Construction and Installation

The three monitoring wells were installed through the 6.25-inch (MW-105) or 8-inch (MW-106S and MW-106D) diameter roto-sonic borehole. The targeted depth for the placement of the well screens was determined from the estimated borehole depth elevation and geology encountered during drilling.

Before installing the well at the targeted depth, a minimum 6-inch thick filter pack sand cushion was placed in the bottom of the borehole. The well filter pack consisted of Global Drilling Supplies Global Quartz Silica Sand a clean, uniform, 12/20-grade silica sand.

Wells were constructed with 10-foot long, 0.010-inch machine-slotted screens, threaded end caps, and 10-foot long casing. 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 Well MW-106D was installed at a depth 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. The first centralizer was placed approximately 14.5 feet from the bottom of the well to achieve centralizer placement above both the well screen and the bentonite seal. All remaining centralizers were placed on approximate 10-foot centers, along the well casing, proceeding upward towards the ground surface.

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. Additional well filter pack sand was placed around the well screen that extended from the bottom of the well to approximately 2-feet above the top of 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 placement depth was achieved.

An approximate 2-foot thick bentonite seal was placed immediately above the well filter pack sand consisting of Polymer Drilling Systems Pel-Plug 3/8-in coated, time release, bentonite pellets. The bentonite pellets were placed using the gravity free-fall method while continuously monitoring downhole with a weighted tape measure to confirm bridging was not occurring and that the targeted placement depth was achieved. The bentonite seal was allowed to hydrate per manufacturer's recommendation of 2-hours before placing the annular seal.

The annular seal consisted of Haliburton Quik-Grout<sup>®</sup>, 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.

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 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 opposite sides of the steel protective casing, approximately one-half inch above the concrete pad. Four (4) bollard posts were installed at the corners of the well pad to provide protection from vehicle or equipment strikes. The 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 approximately 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 G**, 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 H**. Photos of the typical monitoring well construction and installation activities are included in **Appendix C**.

### **3.3 Monitoring Well Development**

Well development was performed on all three newly installed monitoring wells 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 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 or above the top of well screen (as practical based on recharge rate) prior to beginning each successive purging event. Field water quality parameters of turbidity, pH, conductivity and temperature were measured at the beginning and throughout the development. Final water quality parameter readings were recorded after the well was nearly dry. Due to the low yield of these monitoring wells, well development was considered completed after pumping the wells dry three (3) times. Over three saturated 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 I**.

### **3.4 Monitoring Well Surveying**

The new and existing monitoring wells at the Green Landfill were surveyed for both vertical and horizontal control. Surveying was performed by Associated Engineers of Madisonville, Kentucky, a Kentucky-licensed Professional Land Surveyor, on May 19, 2023. The monitoring well locations were surveyed horizontally to the nearest 0.1 foot and referenced to a local coordinate system (northing and easting) using the Kentucky State Plane, Southern Zone and also included 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 survey report prepared by Associated Engineers is provided in **Appendix J**.

### **3.5 Groundwater Occurrence**

Groundwater level data was collected from the newly installed monitoring wells on June 19, 2023. Groundwater levels were measured using a decontaminated, battery-operated, electronic water level probe. The depths to groundwater measured in the monitoring wells were 6.49 feet below top of casing (bTOC) at MW-105, 18.81 feet bTOC at MW-106S, and 22.50 feet bTOC at MW-111. Groundwater elevations calculated using the measured water levels and surveyed top of well casing elevations were 375.28 feet amsl (MW-105), 368.45 feet amsl (MW-106S), and 365.38 feet amsl (MW-106D). Groundwater level and elevation data are summarized in **Table 2**.

### **3.6 Estimated Vertical Gradient**

Vertical gradients can be estimated using hydrologic data obtained from paired/clustered monitoring wells. One newly installed clustered well pair includes Monitoring Wells MW-106S and MW-106D.

The estimated vertical groundwater gradient is calculated as follows:

$$\frac{\text{Groundwater Elevation (shallow well)} - \text{Groundwater Elevation (deep well)}}{\text{Midpoint of Screen Elevation (shallow well)} - \text{Midpoint of Screen Elevation (deep well)}}$$

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

The estimated vertical gradient was 0.284 downward at MW-106S/D. The estimated vertical gradient is summarized in **Table 3**.

### 3.7 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 west of MW-2 (along western edge of access road) and all decontamination fluid was contained within the pad by a polyvinyl lining. Decontamination fluids were pumped from the decontamination pad and managed in accordance with investigation-derived waste (IDW) procedures specified in Section 3.6.

### 3.8 Investigation-Derived Waste

Excess soil cuttings resulting from the drilling operations through soil overburden were disposed of at the Green Landfill.

Liquid IDW generated during the monitoring well installation activities consisted primarily of decontamination water and groundwater purged during well development. Liquid IDW was temporarily containerized and disposed of on-Site at the Northeast Sediment Pond located directly northeast of the Green Landfill.

### 3.9 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.

## 4.0 REFERENCES

Burns & McDonnell (2023a). *2023 Monitoring Well Installation Work Plan*, Sebree Generating Station, Green Landfill, Webster County, Kentucky, Agency Interest No. 4196. January 5<sup>th</sup>.

Burns & McDonnell (2023b). Safety & Health Program. April 7<sup>th</sup>.

Fairer, G.M. (1973). Geologic Map of the Robards Quadrangle, Henderson and Webster Counties, Kentucky, U.S. Geological Survey.

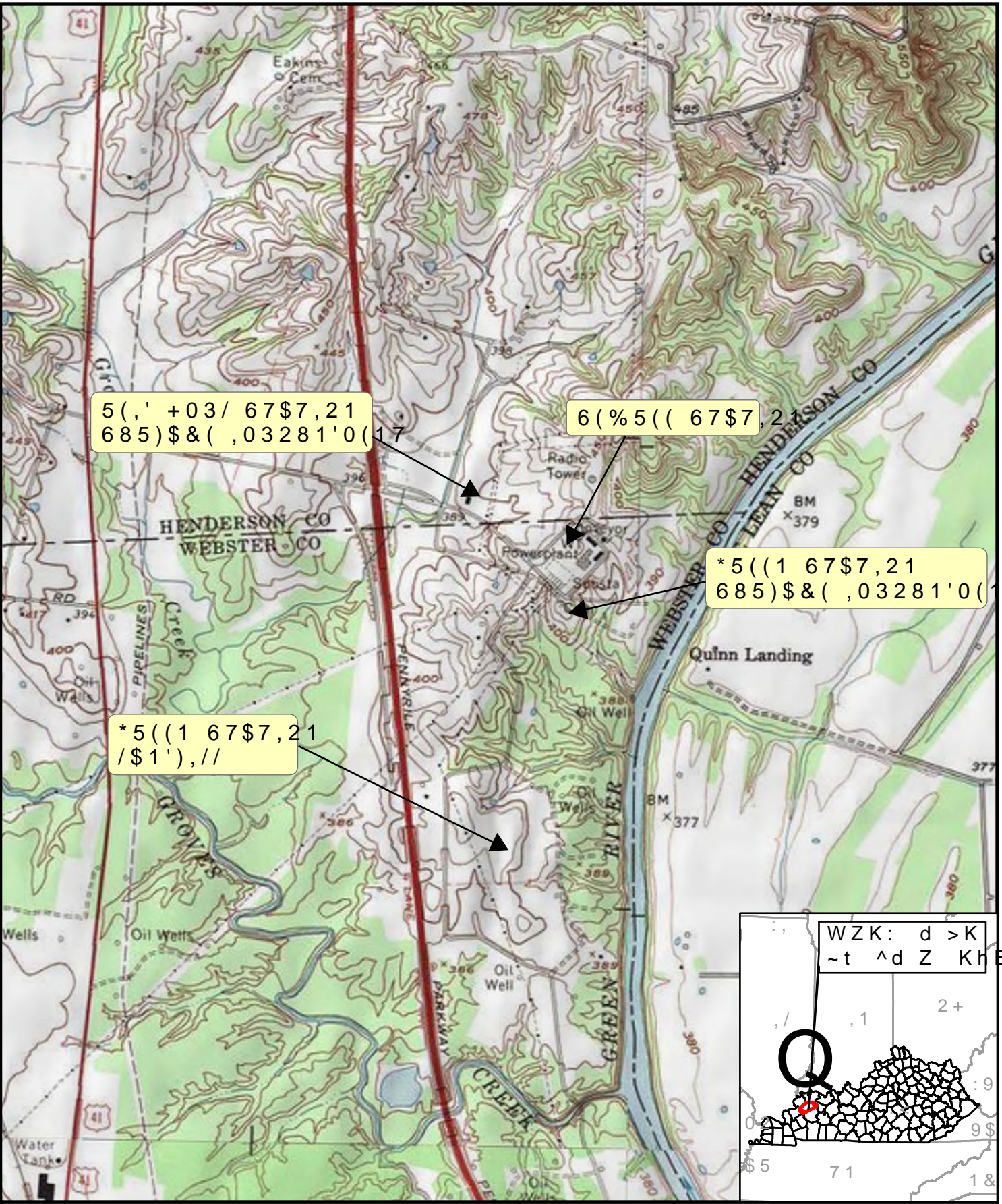
Kentucky Administrative Regulation (KAR), Title 401 Energy and Environmental Cabinet, Department for Environmental Protection, Chapter 6 Water Wells, Section 350, Monitoring Well Construction Practices and Standards (401 KAR 6:350).

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).

KAR, Title 401 Energy and Environmental Cabinet, KDEP, Chapter 46, Coal Combustion Residuals (401 KAR Chapter 46).

## FIGURES

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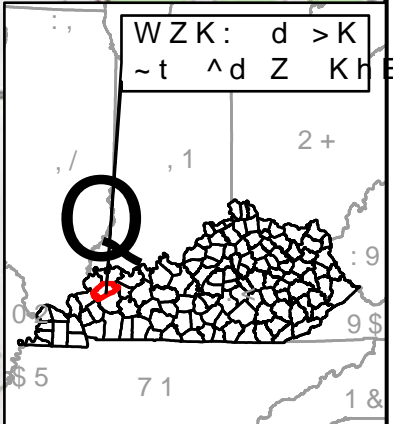


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DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
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DELAWARE QUADRANGLE  
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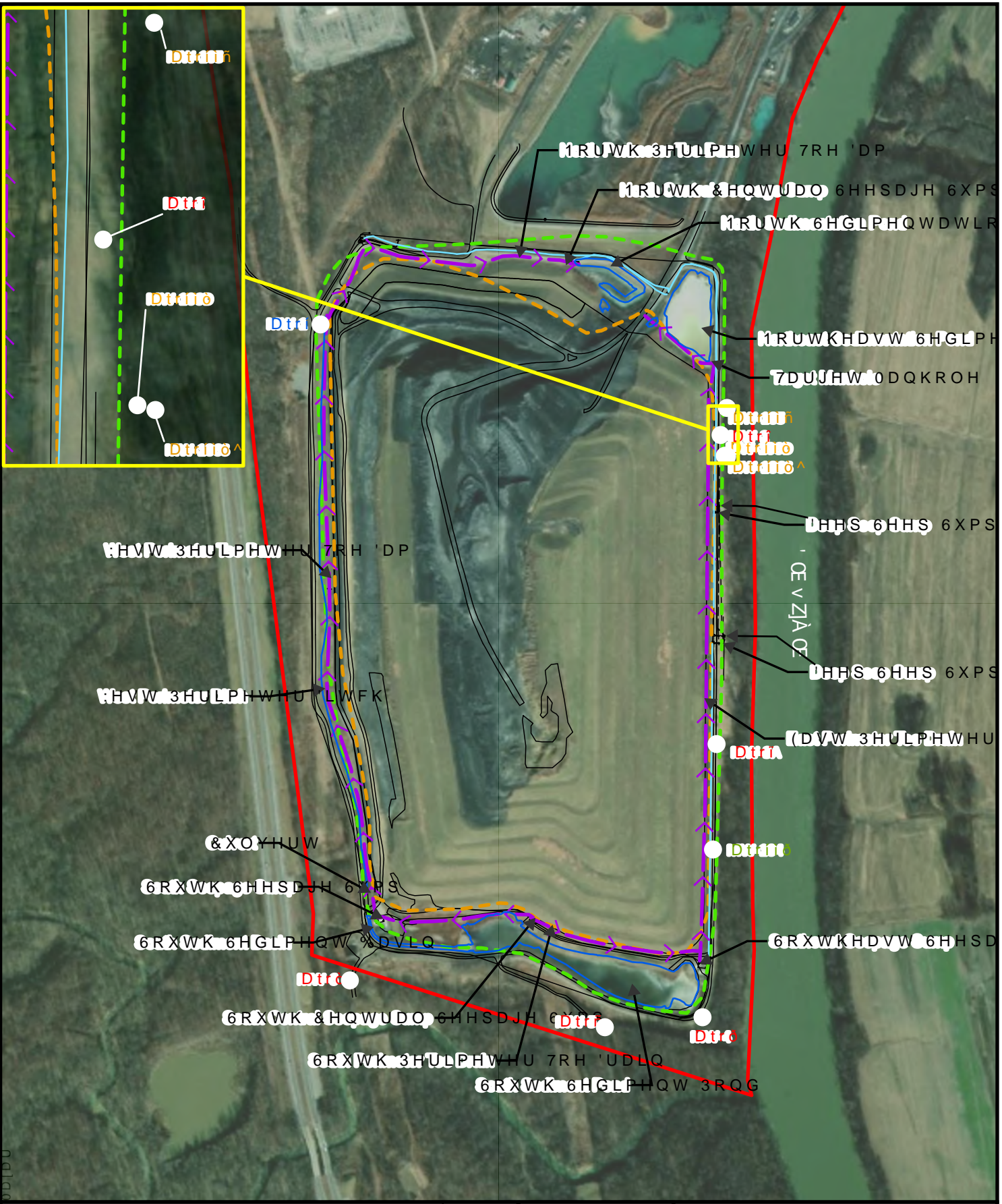


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## **TABLES**

TABLE 1

SUMMARY OF MONITORING WELL CONSTRUCTION, GREEN LANDFILL  
CCR GROUNDWATER MONITORING PROGRAM

BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION  
GREEN STATION LANDFILL  
WEBSTER COUNTY, KENTUCKY

Well No.		Location*		Reference Elevation*		Casing Length (feet, TOIC)	Casing Size / Type (ID / Material)	Filter Pack Interval (feet, GS, NAD27)		Screened Interval (feet, GS, NAD27)		Bottom of Boring (feet, GS)
		Lat (degrees)	Long (degrees)	TOIC (feet, NAD27)	GS (feet, NAD27)			Top	Bottom	Top	Bottom	
<b>Program Monitoring Wells</b>												
MW-1 (8002-9625)	U / B	37.637783	-87.508381	422.56	420.11	45.5	4 inch / PVC	389.3	375.1	387.1	377.1	45
MW-2 (8002-9630)	D	37.636481	-87.500967	391.82	389.41	50.3	4 inch / PVC	353.6	340.4	351.6	341.6	49
MW-3A (8003-6430)	D	37.631925	-87.500758	386.27	380.47	41.3	4 inch / PVC	357.0	344.3	355.0	345.0	36.2
MW-4 (8002-9628)	D	37.628203	-87.500964	391.11	388.62	33.1	4 inch / PVC	368.2	355.6	366.2	356.2	33
MW-5 (8002-9627)	D	37.628067	-87.502836	389.91	387.28	27.5	4 inch / PVC	374.3	361.3	372.3	362.3	26
MW-6 (8002-9626)	D	37.629003	-87.506903	388.10	385.55	45.5	4 inch / PVC	354.8	340.6	352.6	342.6	45
<b>Characterization Well</b>												
MW-104 (8007-1139)	D / C	37.630564	-87.500964	395.4	392.44	60.84	2 inch / PVC	344.4	331.9	342.4	332.4	60
MW-105 (8008-0529)	D / C	37.636833	-87.500928	381.77	378.90	33.87	2 inch / PVC	359.9	346.9	358.1	348.1	32
MW-106S (8008-0527)	D / C	37.636178	-87.500928	387.26	384.75	41.51	2 inch / PVC	357.8	344.8	356.0	346.0	40
MW-106D (8008-0528)	D / C	37.636194	-87.500947	387.88	385.30	66.08	2 inch / PVC	333.8	321.3	332.0	322.0	64

\* Well location and reference elevations surveyed by Associated Engineers, Inc. of Madisonville, KY on May 19, 2023.

PVC = Polyvinyl chloride

ID = Internal Diameter

TOIC = Top of internal casing

GS = Ground Surface

U / B = Upgradient / Background

D = Downgradient

C = Characterization

**TABLE 2  
GROUNDWATER ELEVATIONS, GREEN LANDFILL - 2023  
BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION  
GREEN STATION LANDFILL  
WEBSTER COUNTY, KENTUCKY**

Reference Elevation TOIC*(ft, NAD27)	NEWLY INSTALLED GROUNDWATER MONITORING WELLS					
	MW-105		MW-106S		MW-106D	
	Downgradient/Characterization 381.77		Downgradient/Characterization 387.26		Downgradient/Characterization 387.88	
	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)
5/19/2023	6.49	375.28	18.81	368.45	22.50	365.38

\* Well TOIC reference elevations surveyed by Associated Engineers, Inc. of Madisonville, KY on May 19, 2023.  
 Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum  
 TOIC = Top of internal casing  
 GW = Groundwater  
 GS = Ground Surface  
 NA = Not Available  
 NM = Not Measured



**Table 3**  
**Estimated Vertical Hydraulic Gradients**  
 Green CCR Landfill  
 Big Rivers Electric Corporation - Sebree Station  
 Robards, Kentucky

Well Cluster	Top of Casing Elev. (ft amsl)	Total Well Depth (feet bTOC)	Well Screen Elevation		Screened Geologic Formation	Water Depth (ft bTOC)	Water Elevation (ft amsl)	Difference in Water Level (ft)	Vertical Gradient (feet/foot)	
			Top (ft amsl)	MidPoint (ft amsl)						
<b>19-May-23</b>										
MW-106S	387.26	40.00	355.95	345.95	Clay with Silt	11.70	375.56	6.81	0.28434	Downward
MW-106D	387.88	64.00	332.0	322.00	Sandstone w/ Shale Interbeds	19.13	368.75			

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

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 WORK PLAN APPROVAL LETTER AND REVISED  
GREEN LANDFILL PERMIT**



**Andy Beshear**  
GOVERNOR

**ENERGY AND ENVIRONMENT CABINET**  
**DEPARTMENT FOR ENVIRONMENTAL PROTECTION**

300 Sower Boulevard  
Frankfort, Kentucky 40601  
Phone: (502) 564-2150  
Fax: 502-564-4245

**Rebecca Goodman**  
SECRETARY

**Anthony R. Hatton**  
COMMISSIONER

January 11, 2023

Ms. Heather Todd, Plant Manager  
Big Rivers Electric Corporation – Sebree Generating Station  
9000 KY 2096  
Robards, Kentucky 42452

**Sent via E-mail Only**

RE: Approval of Monitoring Well Installation Work Plan  
Big Rivers Electric Corporation – Sebree Generating Station  
Agency Interest No. 4196  
Application I.D. No. APE20220004  
Webster County

Dear Ms. Todd,

The Kentucky Division of Waste Management (DWM), Solid Waste Branch has reviewed the above-referenced Monitoring Well Installation Work Plan for the Big Rivers Electric Corporation Sebree Generating Station, received January 6, 2023. Based upon the information submitted, the subject plan is hereby approved.

The proposed procedures are acceptable, provided the work is conducted in complete compliance with 401 KAR 6:350. Any deviation from the approved plan requires prior approval of DWM pursuant to 401 KAR 6:350 Section 12(1), and any deviation from the requirements of 401 KAR 6:350 requires the driller to obtain a variance from the Kentucky Division of Water pursuant to 401 KAR 6:350 Section 1(7).

DWM notes that Section 2.2 of the subject plan states, “... *the existing wells meet the requirements of Title 40 CFR Section 257.90 of the CCR Rule for the installation of a groundwater monitoring system*”. However, because it has not reviewed a groundwater monitoring plan for this CCR Unit pursuant to 401 KAR Chapter 46 or 40 CFR 257, DWM is unable to concur with this statement.

Please be advised that approval of this plan is limited to the work described therein. The present correspondence does not constitute the approval of a groundwater monitoring system, and

it does not constitute an approval of any other detail of the construction or abandonment of groundwater monitoring wells at Big Rivers Electric Corporation Sebree Generating Station, including any well's construction, location, depth, or suitability for monitoring any particular CCR unit, aquifer, or aquifer zone pursuant to 401 KAR Chapters 46.

Should you have any questions, or if you would like to schedule a meeting regarding this matter, please contact Todd Hendricks, P.G. at [todd.hendricks@ky.gov](mailto:todd.hendricks@ky.gov).

Sincerely,



---

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

DA/ec/lk/rth/lkg

c: Ms. Heather Todd via e-mail [heather.todd@bigrivers.com](mailto:heather.todd@bigrivers.com)  
Mr. Mark Bertram via e-mail [mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com)





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

**PERMIT**

**Facility:** **Green Station Landfill**  
9000 KY 2096  
Robards, KY 42452

**Permittee:** **Big Rivers Electric Corporation**  
9000 KY 2096  
Robards, KY 42452

**Agency Interest: Big Rivers Electric Corp - Reid HMP&L Station 2 - Green Station**  
9000 KY 2096  
Robards, KY 42452

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 #:** 4196

**Solid Waste Permit #:** sw11700016, SW11700007

**County:** Webster

**Permitted Activities:**

Subject Item	Activity	Type	Status
ACTV001	Landfarm Class II-SW/11700016	Activity Terminated	Terminated
ACTV004	Special Waste Landfill-Coal/11700007	Construction/Operation	Converted
ACTV005	Coal Combustion Residuals Surface Impoundment/11700007	Permit by Rule	Converted
ACTV006	Coal Combustion Residuals Surface Impoundment/11700007	Permit by Rule	Converted
ACTV007	CCR Unit - Landfill/11700007	Construction/Operation	Active
ACTV008	CCR Unit - Impoundment/11700007	Construction/Operation	Active
ACTV009	CCR Unit - Impoundment/11700007	Construction/Operation	Active

## PERMIT

## Acreage Summary:

## Waste Disposal Area (in Acres):

Activity	Disposal Area
CCR Unit - Impoundment	16.70
CCR Unit - Impoundment	19.40
CCR Unit - Landfill	110.00
<b>Total Disposal Area</b>	<b>146.10</b>
<b>Total Permitted Area</b>	<b>200.00</b>

## Cost Estimate Summary:

Coverage Type	Cost Estimate	Effective	Comments
Closure	\$75,007,378.00	12/09/2021	Approved under APE20210002
Post-Closure	\$4,542,600.00	12/09/2021	Approved under APE20210002

## 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
Corporate Financial Test	1	\$79,549,978.00	11/17/2021	

First Operational Permit Effective Date: 09/13/1979 -- Inert Landfill

Permit Effective Date: 09/13/1987

Permit Expiration Date: Life of Facility

Permit issued: **12/09/2021**

Sincerely,



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

## PERMIT

**Permit Conditions:****Subject Items****ACTV0001 - Landfarm Class II-SW**

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

1. 11-29-1994 - Registered Permit-By-Rule - Special Waste Class II Landfarm Registration - LD1NW1 - ARP19930001
2. 06-09-1995 - Minor Modification - ARP19940001
3. 02-19-1997 - Termination Letter

**ACTV0004 - Special Waste Landfill-Coal****Variances, Alternate Specifications and Special Conditions:**

1. General: The landfill consists of approximately 110 acres and has been converted from a Special Waste Landfill (ACTV0004) to a CCR Unit - Landfill (ACTV0007) on December 09, 2021. The 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 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]

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

1. 10-01-1979 - New Permit Application Approval - SHF19790001
2. 09-13-1979 - Construction Permit Renewal - SHF19790001
3. 10-07-1980 - Construction Permit Renewal - SHF19800001
4. 09-10-1981 - Operation Permit - SHF19810001
5. 09-13-1982 - Operation Permit Renewal - Inert Landfill - SHF19820001
6. 02-04-1988 - Operation Permit Renewal - SHF19880001
7. 09-19-1990 - MOMN1
8. 06-14-1992 - PR1
9. 01-30-1996 - MOGW
10. 02-28-1996 - Minor Modification - Conversion to Special Waste Landfill - LE2PR1 & LI1MOMN1 - SHF19960001
11. 03-22-1999 - Transfer Ownership from Big Rivers Electric Corporation to Western Kentucky Energy Corp - LS1PT1 - SHF19990001
12. 06-13-2000 - HEX - LS1MOHX1 - SHF20000001
13. 05-25-2005 - Add Kenneth Coleman Plant Fly Ash and Bottom Ash to Waste Stream - APE20010001
14. 07-25-2005 - Groundwater Assessment Plan - AIN20040003
15. 10-05-2010 - Transfer Ownership from Western Kentucky Energy Corp to Big Rivers Electric Corporation - APE20090007
16. 06-08-2011 - Vertical Expansion - APE20100001
17. 12-17-2014 - Vertical Expansion - APE20130001
18. 11-30-2017 - Amendment to Groundwater Monitoring Plan - APE20170001

## PERMIT

19. 12-09-2021 - See the CCR Unit-Landfill activity (ACTV0007) for additional information

**ACTV0005 - Coal Combustion Residuals Surface Impoundment****Variances, Alternate Specifications and Special Conditions:**

1. General: The CCR Pond 1, also called the Green Station Ash Pond, consists of approximately 16.7 acres and has been converted from a Coal Combustion Residuals Surface Impoundment (ACTV0005) to a CCR Unit - Impoundment (ACTV0008) on December 09, 2021. The impoundment is a CCR Unit as defined by 401 KAR 46:101 and is subject to the standards pursuant to 401 KAR 46:110, and it 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]

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

1. 12-09-2021 - See the CCR Unit-Impoundment activity (ACTV0008) for additional information

**ACTV0006 - Coal Combustion Residuals Surface Impoundment****Variances, Alternate Specifications and Special Conditions:**

1. General: The CCR Pond 2, also called the Henderson Municipal Power and Light Station Pond, consists of approximately 19.4 acres and has been converted from a Coal Combustion Residuals Surface Impoundment (ACTV0006) to a CCR Unit - Impoundment (ACTV0009) on December 09, 2021. The impoundment is a CCR Unit as defined by 401 KAR 46:101 and is subject to the standards pursuant to 401 KAR 46:110, and it 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]

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

1. 12-09-2021 - See the CCR Unit-Impoundment activity (ACTV0009) for additional information

**ACTV0007 - CCR Unit - Landfill****Variances, Alternate Specifications and Special Conditions:**

1. General: The owner or operator shall submit the \$15,000 annual fee no later than July 31 of each year pursuant to 401 KAR Chapter 46:120. Applications and reports specific to only the 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]

2. General: The landfill consists of approximately 110 acres and has been converted from a Special Waste Landfill (ACTV0004) to a CCR Unit - Landfill (ACTV0007) on December 09, 2021. The 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 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]



## PERMIT

3. 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 ACTV0004 - Special Waste Landfill-Coal and with all provisions in the Approved Applications listed on this permit document for ACTV0007 - CCR Unit - Landfill. [401 KAR 45:030, 401 KAR 45:140]

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

1. See the Special Waste Landfill-Coal activity (ACTV0004) for additional information and site history
2. 12-09-2021 - Revised Cost Estimate - Permit Issued in accordance with 401 KAR Chapter 46 technical standards - APE20210002

### **ACTV0008 - CCR Unit - Impoundment**

**Variances, Alternate Specifications and Special Conditions:**

1. 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 provisions in the Approved Applications listed on this permit document for ACTV0008 - CCR Unit - Impoundment. [401 KAR 45:030, 401 KAR 45:140]

2. General: The owner or operator shall submit the \$15,000 annual fee no later than July 31 of each year pursuant to 401 KAR Chapter 46:120. Applications and reports specific to only the impoundment, 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]

3. General: The CCR Pond 1, also called the Green Station Ash Pond, consists of approximately 16.7 acres and has been converted from a Coal Combustion Residuals Surface Impoundment (ACTV0005) to a CCR Unit - Impoundment (ACTV0008) on December 09, 2021. The impoundment is a CCR Unit as defined by 401 KAR 46:101 and is subject to the standards pursuant to 401 KAR 46:110, and it 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]

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

1. 12-09-2021 - Revised Cost Estimate - Permit Issued in accordance with 401 KAR Chapter 46 technical standards - APE20210002

### **ACTV0009 - CCR Unit - Impoundment**

**Variances, Alternate Specifications and Special Conditions:**

1. 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

## PERMIT

provisions pursuant to 401 KAR Chapters 30, 40, and 45 as applicable. The owner or operator shall comply with the provisions in the Approved Applications listed on this permit document for ACTV0009 - CCR Unit - Impoundment. [401 KAR 45:030, 401 KAR 45:140]

2. General: The owner or operator shall submit the \$15,000 annual fee no later than July 31 of each year pursuant to 401 KAR Chapter 46:120. Applications and reports specific to only the impoundment, 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]

3. General: The CCR Pond 2, also called the Henderson Municipal Power and Light Station Pond, consists of approximately 19.4 acres and has been converted from a Coal Combustion Residuals Surface Impoundment (ACTV0006) to a CCR Unit - Impoundment (ACTV0009) on December 09, 2021. The impoundment is a CCR Unit as defined by 401 KAR 46:101 and is subject to the standards pursuant to 401 KAR 46:110, and it 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]

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

1. 12-09-2021 - Revised Cost Estimate - Permit Issued in accordance with 401 KAR Chapter 46 technical standards - APE20210002

### Financial Assurance

## ACTV0002 - Financial Assurance

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

1. 09-12-1979 - SB#34S45199, \$103,000.00
2. 09-20-1982 - SB#B423619, \$103,000.00; SB#34S45199 released
3. 01-21-1988 - CD#107101, \$579,500.00
4. 07-15-1994 - SB#CSB0162685, \$682,500.00; CD#107101, SB#B423619
5. 07-01-1998 - LOC#SLCDC3896/912679, \$682,500.00
6. 11-12-1998 - LOC#SLCDC3896/912768, \$682,500.00; LOC#SLCDC3896/912679 released
7. 01-15-1999 - LOC#SLCDC3896/912852, \$682,500.00; LOC#SLCDC3896/912768 released
8. 09-18-2003 - LOC#003325000, \$714,358.00; SB#CSB0162685 released
9. 02-11-2004 - LOC#003325000 increased to \$738,105.00
10. 08-19-2004 - LOC#003325000 increased to \$749,915.00
11. 06-27-2005 - LOC#003325000 increased to \$765,663.00
12. 05-10-2006 - LOC#003325000 increased to \$782,508.00
13. 07-19-2007 - LOC#003325000 increased to \$805,200.00
14. 07-15-2009 - LOC#062-H-5102-001, \$849,248.00
15. 06-03-2011 - LOC#062-H-5102-001 increased to \$870,750.00
16. 05-19-2014 - LOC#062-H-5102-001 increased to \$1,410,083.00
17. 08-19-2021 - Financial Test, \$30,564,850.00
18. 11-17-2021 - Financial Test increased to \$79,549,978.00
19. 12-09-2021 - LOC #062-H-5102-001 released

PERMIT

**Monitoring Conditions**

**GSTR0001 - Groundwater Monitoring - SWB: Groundwater Monitoring Group - Special Waste Landfill**

**Group Members:** STRC0019 - Well MW-01; STRC0020 - Well MW-02; STRC0022 - Well MW-04; STRC0023 - Well MW-05; STRC0024 - Well MW-06; STRC0033 - Well MW-03A

**Variations, Alternate Specifications and Special Conditions:**

1. Reports and Submittals: The owner or operator shall submit a Construction Progress Report (CPR) within 45 days of any groundwater monitoring well abandonment activities. [401 KAR 45:140]
2. Groundwater Monitoring: 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]

**GSTR0002 - Groundwater Monitoring - SWB: Chapter 46 Groundwater Monitoring Group**

**Group Members:** AIOO4196 -

**Variations, 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]

**GSTR0003 - Groundwater Monitoring - SWB: Chapter 6 Groundwater Monitoring Group**

**Group Members:** AIOO4196 -

**Variations, 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]
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,

PERMIT

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]



**APPENDIX B – BREC 10-DAY NOTIFICATION LETTER TO KDWM**



Sebree Station  
9000 Highway 2096  
Robards, KY 42452  
www.bigrivers.com

April 5, 2023

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

Re: Big Rivers Electric Corporation, Sebree Station  
Agency Interest No. 4169  
Monitoring Well Installation Work Plan, APE20220004  
10 day Notification for Installation of Groundwater Monitoring Wells

Dear Mr. Anderson,

Big Rivers Electric Corporation received a revised permit for Sebree Station, Green Station Landfill (SW11700007,) on December 9, 2021. In addition, a revised Monitoring Well Installation Work Plan per Application I.D. No. APE20220004 was previously approved on January 11, 2023.

BREC has contracted Burns & McDonnell Engineering Company, Inc., (Burns & McDonnell) to assure drilling, installation, and abandonment of the three 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 on-site at Sebree Station on April 24, 2023 with the work expected to continue through May 2023. A Construction Progress Report (CPR,) will be submitted within 45 days of the monitoring well installation activities in accordance with the permit condition GSTR003.

Please contact Mark Bertram, Manager Environmental Services, at (270) 844-5708, or [mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com), 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."

Best Regards,

A handwritten signature in black ink that reads "Heather Todd". The signature is written in a cursive, flowing style.

Heather Todd  
Plant Manager

## **APPENDIX C - FIELD PHOTOGRAPHS**

**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>Constructed Decontamination Pad used for decontamination prior to drilling, between borings, and at completion of project.</p> <p>Photo looking west-southwest.</p> <p>4/25/2023</p>
	<p>Typical decontamination of sonic drill casing/tooling prior to the start of drilling.</p> <p>Photo looking west.</p> <p>4/25/2023</p>



**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
 <p>A photograph showing a Roto-Sonic drill rig on a dirt clearing. The rig is a tracked machine with a vertical mast and various cables. To the right, there is a stack of wooden logs. The background shows a wooded area with green trees. A timestamp in the bottom right corner reads "Apr 25, 2023 3:48:46 PM".</p>	<p>Roto-Sonic drill rig setup to at MW-105.</p> <p>Photo looking northwest.</p> <p>4/25/23</p>
 <p>A photograph showing a typical setup for well drilling. A Roto-Sonic drill rig is on the left. Three workers in high-visibility vests and hard hats are standing near a stack of logs. In the foreground, there are several large metal pipes stacked together. A timestamp in the bottom right corner reads "Apr 27, 2023 9:03:47 AM".</p>	<p>Typical setup for well drilling at MW-106D.</p> <p>Photo looking east.</p> <p>4/27/23</p>





**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>Removal of soil core from 4-inch core barrel placed into plastic bag at MW-105.</p> <p>Photo looking northwest.</p> <p>4/25/23</p>
	<p>Typical installation of 2-inch PVC well casing through sonic casing at MW-106S.</p> <p>Photo looking north.</p> <p>4/26/23</p>





**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>Typical placement of sand filter pack at MW-106D.</p> <p>Photo looking southeast.</p> <p>4/27/23</p>
	<p>Typical placement of 3/8" bentonite pellets for bentonite seal at MW-106S.</p> <p>Photo looking southeast.</p> <p>4/26/23</p>





**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>Typical mixing of high-solids bentonite slurry grout at MW-106S.</p> <p>Photo looking east.</p> <p>4/26/23</p>
	<p>Typical setup for pumping high-solids bentonite grout with tremie pipe for annular seal of well at MW-106S.</p> <p>Photo looking north-northeast.</p> <p>4/26/23</p>



**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>Typical addition of 7-inch sonic casing overriding the 6-inch sonic casing at MW-106S.</p> <p>Photo looking northeast.</p> <p>4/26/23</p>
	<p>Typical setup for pumping high-solids bentonite grout with tremie pipe for annular well seal at MW-106D.</p> <p>Photo looking northeast.</p> <p>4/28/23</p>



**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky



Photograph	Description
	<p>Centralizers installed on riser pipe for construction of MW-106D (&gt;50 feet [ft] below ground surface [bgs]) placed every 10-feet starting above the bentonite seal to ground surface.</p> <p>Photo looking southeast.</p> <p>4/27/23</p>
	<p>Typical construction of well surface completion consisting of formed well pad, protective well casing, and bollards. Pouring concrete into upper 3-feet of annular space from top of bentonite slurry grout to ground surface.</p> <p>4/29/23</p>



**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
 <p style="text-align: right;">Apr 29, 2023 2:25:29 PM</p>	<p>Typical outer protective well casing being pushed into concrete slurry.</p> <p>4/29/23</p>
 <p style="text-align: right;">Apr 30, 2023 9:19:50 AM</p>	<p>Typical surface completion of monitoring wells.</p> <p>Photo looking east at MW-106S (right/south) and MW-106D (left/north).</p> <p>4/30/23</p>

**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
 <p align="right">Apr 30, 2023 9:20:57 AM</p>	<p>Typical weep hole (shown by arrow) near base of protective well casing (above well pad).</p> <p>Photo looking east.</p> <p>4/30/23</p>
 <p align="right">May 1, 2023 9:03:14 AM</p>	<p>Photo of MW-105. Typical completed monitoring well with sand filler between well riser pipe and protective well casing. Kentucky well tag placed on the underside of the protective well cover.</p> <p>5/01/23</p>



**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
	<p>MW-105 core from 0 ft to 5 ft bgs. Bottom of core at right.</p> <p>Clay, some silt, trace fine sand, medium-high plasticity.</p> <p>4/25/23</p>
	<p>MW-105 core from 5 ft to 10 ft bgs. Bottom of core at right.</p> <p>5-7.4 ft bgs: Clay, some silt, trace fine sand, medium-high plasticity.</p> <p>7.4-10 ft bgs: Clay with silt, some fine sand, medium-high plasticity, medium-high stiffness.</p> <p>4/25/23</p>



**APPENDIX C – SITE PHOTO LOG**  
**Monitoring Well Construction Progress Report**  
**Big Rivers Electric Corporation**  
**Robards, Kentucky**

Photograph	Description
	<p>MW-105 core from 10 ft to 20 ft bgs. Bottom of cores at left.</p> <p>10-15 ft bgs (middle bag; poor recovery) and 15-20 ft bgs (bottom bag). Top bag from previous run (5-10 ft bgs).</p> <p>10-15ft bgs: Clay with silt some fine sand, medium plasticity medium to high stiffness dark yellowish, Brown 10YR 3/4.</p> <p>15-17ft bgs: Same as above. High plasticity &amp; some moisture.</p> <p>17-20 ft bgs: Clay with some silt. Trace fine sand. High plasticity. Some moisture, very dark grey 2.5 Y3/1. Medium to high stiffness.</p> <p>4/25/23</p>
	<p>MW-105 core from 20 ft to 30 ft bgs. Bottom of cores at right.</p> <p>20-25 ft bgs (top bag) and 25-30 ft bgs (bottom bag).</p> <p>20-25.5ft: Clay with some silt, trace fine sand. High plasticity. Damp-moist. Very dark gray 2.5Y 3/1). Medium to high stiffness.</p> <p>25.5-30ft bgs: Clay with some silt. Trace fine sand. High to very high plasticity. Moist grayish brown 10YR 5/2. High stiffness.</p> <p>4/25/23</p>



**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
	<p>MW-105 core from 30 ft to 32 ft bgs. Bottom of core at right. Note interface of clay and sandstone (yellow arrow).</p> <p>30-32ft bgs: Weathered sandstone. Fine to very fine-grained sand. Light tan color. Some iron staining.</p> <p>4/25/23</p>
	<p>MW-106S core from 0 ft to 5 ft bgs. Bottom of core at left.</p> <p>0-5 ft bgs: Clay with some silt, trace fine sand, trace fine gravel. Medium to high plasticity medium to high stiffness. brown 10YR 4/3. Some iron-stained lenses.</p> <p>4/26/23</p>




**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
	<p>MW-106 core from 5 ft to 10 ft bgs. Bottom of core at right.</p> <p>5-10ft bgs: Same as above. trace to some coarse gravel. Some form staining. Rock in core barrel resulted in low recovery.</p> <p>4/26/23</p>
	<p>MW-106S core from 10 ft to 20 ft bgs. Bottom of cores at right.</p> <p>10-15 ft bgs (bottom bag) and 15-20 ft bgs (top bag).</p> <p>10-11.8ft bgs: Same as above. trace to some coarse gravel. Some form staining. Rock in core barrel resulted in low recovery.</p> <p>11.8-15 ft bgs: Clay trace silt. High plasticity medium stiffness dark grey 10YR 4/1. Trace to some iron staining.</p> <p>15-20ft bgs: Clay with trace to some silt trace fine sand. grey streaking dark yellowish brown 10YR 3/6. Medium plasticity medium stiffness.</p> <p>4/26/23</p>





**APPENDIX C – SITE PHOTO LOG**  
**Monitoring Well Construction Progress Report**  
**Big Rivers Electric Corporation**  
**Robards, Kentucky**

Photograph	Description
	<p>MW-106 core from 20 ft to 30 ft bgs. Bottom of cores at right.</p> <p>20-25 ft bgs (bottom bag) and 25-30 ft bgs (top bag).</p> <p>20-25 ft: Clay trace silt, high plasticity medium stiffness. Brown 10YR 5/3. Consistency remains the same throughout changing to a slightly dark brown. More iron staining present</p> <p>25-30 ft: Same as above. Medium to high stiffness. Less iron staining present.</p> <p>4/26/23</p>
	<p>MW-106S core from 30 ft to 40 ft bgs. Bottom of cores at right.</p> <p>30-35 ft bgs (bottom bag) and 35-40 ft bgs (top bag).</p> <p>30-35ft: Clay trace to some silt. Trace fine sand. High plasticity medium stiffness. Dark grey 10YR 4/1.</p> <p>35-38 ft bgs: Same as above.</p> <p>38-40ft bgs: Transition to coarse gravel with some fine sand trace to some clay and silt. Dark grey. No plasticity medium to low stiffness.</p> <p>Note gravel and sand near bottom of core (yellow arrow).</p> <p>4/26/23</p>




**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
	<p>MW-106D core from 0 ft to 10 ft bgs. Bottom of core at right.</p> <p>0-1ft bgs: Topsoil organic</p> <p>1-10ft bgs: Clay with some silt, trace fine sand. Medium plasticity medium stiffness dark yellowish, brown 10YR 4/4. Low to medium moisture.</p> <p>4/27/23</p>
	<p>MW-106D core from 10 ft to 20 ft bgs. Bottom of core at right.</p> <p>10-15ft bgs: Clay trace to some silt high plasticity high moisture medium stiffness. Light olive brown 2.5Y 5/4.</p> <p>15-20ft bgs: Clay with silt trace fine sand trace fine to coarse gravel medium to high stiffness dark yellowish brown 10YR 4/4 medium plasticity medium moisture.</p> <p>4/26/23</p>





**APPENDIX C – SITE PHOTO LOG**  
**Monitoring Well Construction Progress Report**  
**Big Rivers Electric Corporation**  
**Robards, Kentucky**

Photograph	Description
	<p>MW-106D core from 20 ft to 30 ft bgs. Bottom of cores at right.</p> <p>20-25 ft bgs (bottom bag) and 25-30 ft bgs (top bag).</p> <p>20-25ft: Clay with trace silt low to medium stiffness. Iron staining present throughout yellowish brown 10YR 5/4 medium moisture high plasticity.</p> <p>25-30ft: Same as above trace iron staining high stiffness medium to high plasticity.</p> <p>4/27/23</p>
	<p>MW-106D core from 30 ft to 40 ft bgs. bottom of cores at right.</p> <p>30-35 ft bgs (bottom bag) and 35-40 ft bgs (top bag).</p> <p>30-35 ft: Clay trace silt high plasticity medium stiffness dark grey 2.5Y 4/11.</p> <p>35-40ft: Sand with gravel fine to coarse sand/ gravel dark grey 2.5Y 4/1 trace to some clay and silt none to trace plasticity.</p> <p>4/27/23</p>


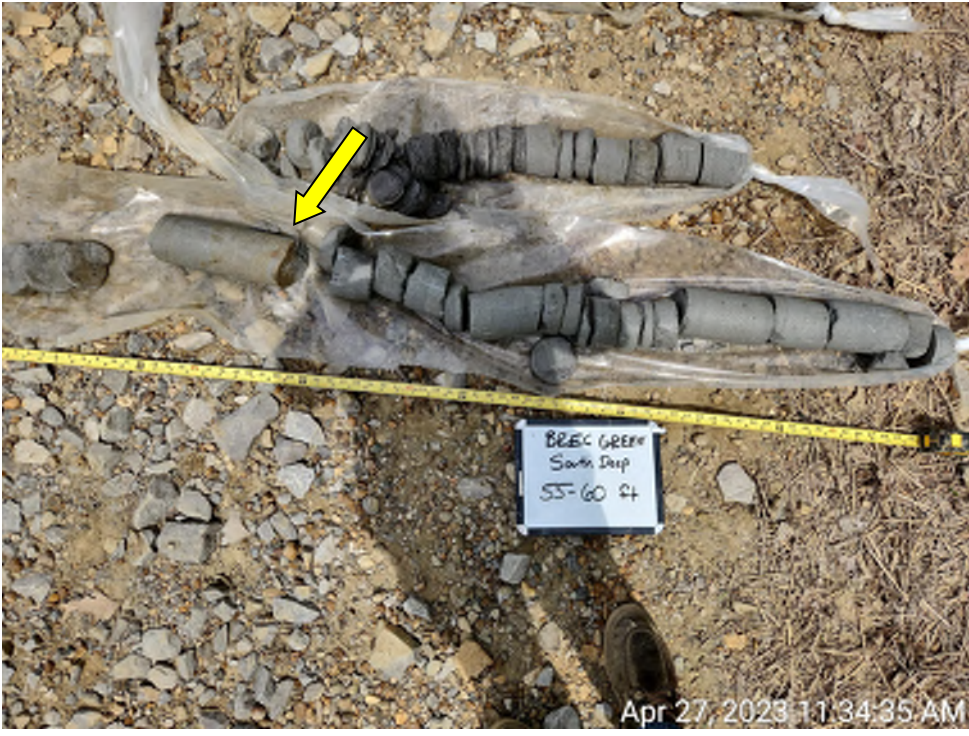


**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky


Photograph	Description
	<p>MW-106D core from 40 ft to 45 ft bgs. Bottom of core at right.</p> <p>40-45ft: Interbedded sandstone and shale. Weathered shale bluish grey color. Soft fine-grained sandstone breaks easily micaceous, pyrite and tan color.</p> <p>Note interface of clay and weathered sandstone/shale around 42ft bgs (yellow arrow).</p> <p>4/27/23</p>
	<p>MW-106D core from 45 ft to 50 ft bgs. Bottom of core at right.</p> <p>45-50ft: Tan light iron-stained sandstone fine grained micaceous. Dark grey shale. Grey sandstone fine grained micaceous; some organic streaking/ layers throughout.</p> <p>Note interbedded shale layer around 48 ft bgs (black; yellow arrow) overlying fine-grain sandstone (light gray).</p> <p>4/27/23</p>



**APPENDIX C – SITE PHOTO LOG**  
 Monitoring Well Construction Progress Report  
 Big Rivers Electric Corporation  
 Robards, Kentucky

Photograph	Description
	<p>MW-106D core from 50 ft to 55 ft bgs. Bottom of core at right.</p> <p>50-55ft: Iron-stained band (0.7' ft thick) Dark grey shale. Grey micaceous sandstone. Fine grained some organic streaking/ layers throughout.</p> <p>Note interbedding of sandstone (light gray) and shale (dark gray to black, yellow arrow)</p> <p>4/27/23</p>
	<p>MW-106D core from 55 ft to 60 ft bgs. Bottom of core at right.</p> <p>55-60ft: Same as above Iron-stained band</p> <p>Note iron staining near top of core (yellow arrow).</p> <p>4/27/23</p>

**APPENDIX C – SITE PHOTO LOG**  
Monitoring Well Construction Progress Report  
Big Rivers Electric Corporation  
Robards, Kentucky

Photograph	Description
	<p>MW-106D core from 60ft to 64ft. Note interbedded sandstone and shale at bottom of core (yellow arrow).</p> <p>60-64ft: Sandstone with some thin shale layers.</p> <p>4/27/23</p>

**APPENDIX D – FIELD LOGBOOK**



4/24/23

Monday April 24<sup>th</sup>, 2023

56 Sunny, NNE 5-10 mph

Downhole camera/slug test

Chris Heglund, Josh Frasher

1300 Arrive on site, go through safety training

1400 meet w/ bray Dick and go to MW-2

1415 look at potential well locations

1440 MW2 WL: 20.06

ID: 47.71

1443 set up down hole camera

1450 Begin Downhole Camera

1525 Complete downhole camera  
tear down and pack-up camera.

1612 Diver @ 30' bToc

WL: 20.00' bToc

2 mechanical slugs w 6' length

1830 Complete slug test.

1900 mark locations for wells.

1930 off site

C. Heglund  
J. Frasher

4/25/23

Tuesday April 25<sup>th</sup>, 2023

53-68°F, Partly Sunny, SSE 5-10 mph

Setup/Begin Drilling new MWs

Chris Heglund, Josh Frasher

0955 J. Frasher on site

1000 C. Heglund & Cascade drilling  
on site

1010 PTA/safety meeting

1030 Cascade complete site safety  
orientation

1100 Show Cascade well locations and  
potable water source.

1145 Take equipment on site to unload  
and setup. J. Frasher leave to get ICE

1220 J. Frasher back on site. Cascade off site  
for lunch

1255 Cascade back on site

1305 Begin setup of decon station

1340 Decon station setup. Prep for decon

1410 gravity flow of water from hole is not  
enough for powerwasher. Cascade leaves  
site to get sump pump for decon.

1430 Key State reps on site.

1445 Cascade back on site.

1505 Begin Decon of tooling

C. Heglund  
J. Frasher

~~4/24/23~~

4 4/25/23

1530 set up on MW-~~105~~<sup>105</sup> (north shallow)

1600 Begin drilling at MW-~~105~~<sup>105</sup> SE

1645 Complete drilling 4 1/4" pull up

1700 Collect MW-105-31-32 from 31-32'

bag for soil.

1710 2" sch 40 PVC: End Cg = 0.2'

screen: 10.0'

Riser = 9.99' + 9.98' + (4.98')

1718 Filter Pack Sand = Global Filter Pack

Bags: 1111

Buffer Sand: 32'-31', Top of sand <sup>ch</sup> 19'

\* 1715 Collect MW-105-28-30 from 28-30'

1720 Collect MW-105-23-25 from 23-25ft

1731 Benbrak seal

\* 1730 Collect MW-105-15-17 from 15-17'

1735 Top of bentonite seal at 17ft bag

Add water for hydration ~ 1 bucket

1737 Cap off casing and clean up for day

1750 Cascade offsite

1800 BMCD offsite

~~April 4/25/23~~

4/26/23

J. Frasher

Wednesday April 26<sup>th</sup>, 2023

48-70°F, Sunny, variable wind

MW Install/some drilling

Josh Frasher

0700 Cascade on site

0730 BMCD on site

0735 PTA/safety meeting

0740 warm up rig and prep for grout

0745 top of bentonite at 16.5ft ~ 6" swell

0755 mix grout 3/4 bag grout ~ 20 gallons water

0757 Install 15ft grout pipe

0800 pump grout into well

0802 ~ 15 gallons of grout pumped into casing. begin pulling up remaining rods

0805 Grout at 5ft bag. begin tear down of Rig

\* note \* extra grout will be disposed of with cuttings

0850 Begin Pecan of Rods

0915 Discuss Development of MW-2 with Jim Field (BMCD)

0930 Cascade Stid steer fork broke. New ones located in Henderson. offsite to retrieve

Retire in the Rain

4/26/23

0935 BREC Personell on site to do safety walk through

1045 Cascade back on site with new forks.

1050 Continue Decon and setup of Rig at South shallow MW location

1130 Cascade off site for lunch  
C. Haglund on site

1145 From top of casing WL: 9.83 TD: 35.22  
From ground surface WL: 5.95 TD: 31.25

1255 Cascade back on site

1240 Begin drilling on South Shallow well (mw-1065)

1325 Complete 4x6 sonic setup for 7" over drill

1345 Collect MW-1065-22-24 from 22-24'

L HDup-1  
begin 7" over drill

1355 Collect MW-1065-37-39 from 37-39'

1357 7" at 40' bgs. TD total at 40'

pull up 6" rod  
well casing measurements

Cap: 2.0" risers: 9.97 Screen+cap: 10.20  
9.98  
9.99  
4.98

4/26/23

1410 begin Install of MW-1065.

1411 begin adding sand buffer

1415 Topsoil buffer at 31.8' bgs.

Set well and add filter pack

1432 top of filter pack at 27' bgs  
5.5 bags used

1435 begin adding bentonite pellets

1437 top of bentonite plug at 25' bgs  
Add water for hydration and  
will allow 2hrs to hydrate  
1 bucket used

1445 skid steer cannot access tooling to decon. No concrete with cascade to pour well pad. will begin digging out well pad during downtime

1500 Begin digging MW-105 well pad.

1530 Complete digging out well pad

1610 Clean up soil cuttings. prep for grout

1630 dump ~ 300 gallons of IDW

1638 Begin mixing grout  
1.5 bags ~ 50 gallons

1640 begin pumping vrac tremmie tube into boring

1645 Grout near top of casing will pull up tremmie tube and 7" casing. Grout will be added if needed  
*Not in the plan*



4/26/23

- 1652 All rods pulled out.  
Add gravel to bring up to  
3ft bgs.
- 1700 Tidy up for the night  
take soil cuttings to disposal  
pit.
- 1720 All personnel off site

~~4/26/23~~

J. Frasier

4/27/23

Thursday April 27<sup>th</sup>, 2023

SZ-69, Cloudy w/ Rain in afternoon

MW Instal / Development (Possibility)

Josh Frasier

- 0700 J. Frasier & Cascade on site
- 0710 Morning safety meeting / PTA
- 0720 Begin moving Rig and Tooling  
for Decon / Setup for next well  
Install
- 0735 Begin Decon of Tooling and  
Clear Trees / Branches
- 0800 WL TOC: 8.82 WL BGS: 5.25  
For MW-105
- 0805 WL TOC: 10.41 WL BGS: 9.41  
TD TOC: 40.21 TD BGS: 39.21  
For MW-106S
- 0820 Begin setup at MW-106D  
(Southern Deep Well)
- 0830 Leave to get potable water
- 0905 Cascade back with water, begin  
drilling on MW-106D
- 1000 Bedrock encountered ~ 42ft bgs
- 1005 Discuss Depths w/ Chris Hoglund. Will  
push to 10ft bgs and look for  
a more competent bedrock.
- 1010 Cascade advances 7" to 45ft to  
Seal off overburden.

Ret. Frasier

4/27/23

- 1030 get more water for drilling  
 1050 Return with water Resume drilling  
 from 45' bgs  
 1130 Reach 60 ft bgs pull up and run with  
 6" to 60 ft bgs  
 1200 Break for lunch/gas  
 1320 Return from lunch/gas  
 #1230\* Collect MW-106D-51-53 from 51-53'  
 - note - shale  
 1335 fill water container and dump  
 500 gallons IDW  
 #1240\* Collect MW-106D-58-60 from 58-60'  
 - note - Sandstone  
 1342 Begin pushing back down to 60 ft bgs  
 will drill to 64 ft bgs  
 1400 Resume drilling to 64 ft bgs  
 well construction info  
 Riser length      Screen + cap:  
 9.97                      10.20  
 9.98                      5 Centralizers  
 9.98  
 9.98  
 9.98  
 4.99  
 1420 Finish Coring to 64 ft bgs  
 pull up rods.  
 ID checked to 64

4/27/23

- 1422 begin construction of well.  
 Add sand for cookoff buffer  
 1425 Top of buffer at 63.5' bgs  
 begin adding 12ft of filter  
 pack  
 1435 Top of filter pack at 57.5 ft  
 1437 Begin adding Bentonite pellets  
 1440 Top of Bentonite plug at  
 49.5 ft 27g bucket  
 1445 Clean up area and dump  
 IDW water pH cal 4.3/4.0 7.1/7.0 10.1/10.0  
 Cond: 1400  
 1450 begin Development of  
 MW-105

PH	cond.	Temp	gallons	Turb
8.4	1282	17.8	0.25	N/A
8.5	1231	17.6	2.5	N/A
8.1	1211	17.3	5	N/A

D24

Slow recharge will not allow for 2<sup>nd</sup> development today.

1530: will wait till 1640 for grant provided

Rain holds out

1630 Rain Picks up. Will start in the morning.

1635 Cascade 3 BMD offsite

4/27/23

Ritter on line

18 4/20/23

Friday April 20<sup>th</sup>, 2023

54-68, Cloudy, light winds

Growth MW-104D, Develop wells

Josh Frusher

0700 Cascade on site

0715 BmeD on site

0730 Morning PTA

0735 MW-105 WL: 9.96 from TOC

0740 Begin Development

PH	Cond	Temp	Turb	amount
6.5	2.52mc	15.5	N/A	~1.5gal
6.5	2.33	15.3	N/A	~3gal
6.6	2.24	15.1	N/A	~4.5gal
6.5	2.21	15.2	N/A	~6gal
0753	DZ4			~6.5gal

0755 set up at MW-106S WL: 13.19 TOC

Begin development

PH	Cond	Temp	Turb	amount
7.2	556mc	15.2	N/A	~5gal
7.2	501	15.1	N/A	~2gal
7.2	521	14.8	N/A	~5gal
6.9	743	14.3	N/A	~6gal
6.9	709	14.5	N/A	~7.5gal
6.9	746	15.6	light cloudy N/A	~10gal

well is recharging at same rate as  
comps. will allow full recharge before  
continue development

J. Frusher

4/28/23

13

0850 prep for growth

0852 Begin mining growth

0854 Pump growth into MW-106D

0902 ~50 gallons at growth used.  
will pull up casing and add  
growth if needed.

0920 All tooling out of the ground  
growth at 3ft bgs. move load equipment

0945 Cascade leaves to get water for decon  
Continue clean up/pick up

1015 Return with water

1020 Begin Decon of tooling

1030 Generator broke. will begin loading  
up equipment and tear down decon part  
to allow wells to recharge.

1130 MW-106S WL: 18.21 ft

1132 Surge and begin development

PH	Temp	Cond	Turb	gallons
9.0	18.4	712	N/A	~11 gallons
6.9	17.2	760	N/A	~13 gallons
6.8	16.5	800	N/A	~15 gallons
6.8	16.2	812	N/A	~17 gallons

WL at/below pump. Stop to allow  
recharge.

1150 Cascade off site for lunch and to get  
part for development of MW-2

Return to site



14 4/28/23

1335 Cascade back on site

1337 mw-106s WL: 19.26. will allow  
some more time to recharge

1340 set up on MW-2 with  
plunge block to develop.

1345 Begin surging with plunge  
block.

Very gritty around 20ft BTOC  
above WL

1355 Complete surging WL: 19.28

1400 Begin Development of MW-2

pH	Temp	Cond	Turb	gallons
6.8	23.6	1457	N/A	~5
6.8	20.9	1559	683	~3 <small>Planting solids</small>
6.9	18.2	1609	407	~6 ↓
7.0	18.6	1506	303	~9 Cloudy
6.8	17.7	1620	536	~10 ↓

WL At pump level. will allow recharge ~11

1425 Move back to MW-106s for final  
development WL: 18.21

pH	Temp	Cond	Turb	gallons
6.8	18.7	896	N/A	~17.5
6.7	18.1	887	N/A	~20
6.7	18.1	900	N/A	~22

wells will need to recharge overnight

1500 Begin digging well pads. load  
up rig

4/28/23

15

1505 deploy down hole camera in MW2

1520 finish digging well pads

1522 finish down hole camera

1530 Cascade offsite

1555 BmCD offsite

Cal pH 4.2/4.0 7.1/7.0 10.0/10.0 Cond: 1387

~~4/28/23~~

*Handwritten signature*

16 4/29/23

J. Frasier

Saturday April 29<sup>th</sup> 2023

65-68, Rain showers to cloudy, SSW 5-10 mph

Well pad construction and development

Josh Frasier

0715 BMP/Cascade on site

Cond:

0720 PTA pH cal 4.1/4.0 7.2/7.0 10.1/10.0

0725 MW-106D WL: 22.42 TOC: 65.10 TOC  
~1.5 stuck up

0730 Begin Development and Form Construction

pH	Temp	Cond	Turb	Amount
7.9	14.9	424	N/A	~.5 gallons
7.4	14.6	518	N/A	~4 gallons

0740 DRY ~4.5 gallons

0742 Setup on MW-105 for final development  
WL TOC: 9.22

pH	Temp	Cond	Turb	Amount
6.5	14.8	1.85	N/A	~2 gal
6.5	14.5	1.80	N/A	~4 gal
6.5	14.6	1.65	N/A	~8 gal

0755 DRY

0756 Move to MW-2 WL: 29.68

0805 Perform downwell camera begin  
construction at MW-105 pad/bollards

0915 Begin development of MW-2

4/29/23

17

pH	Temp	Cond.	Turb	Amount
6.6	15.1	1.27	561	~1 gal
6.6	15.4	1.27	502	~3
6.6	15.1	1.26	418	~6
6.6	15.8	1.24	385	~9
6.6	16.0	1.23	300	~12
6.6	16.0	1.22	251	~15
6.7	16.1	1.21	247	~18
6.6	16.2	1.20	231	~20 gal

WL below pump. will allow for  
recharge.0845 Constant Rain. Cascade stand down  
until Rain lightens

0930 Continue working on well pads

1035 MW-106D WL TOC: 31.62 TOC 3ft  
above ground

1037 begin second development

pH	Temp	Cond	Turb	Amount
7.9	16.3	287	N/A	~.25
7.8	15.9	284	N/A	~2 gal
7.5	15.2	289	N/A	~4 gal
7.5	15.6	285	light cloudy N/A 3mg	~5 gal

Dry

1100 Cascade break for lunch and to get  
water

Rite in Rain

18 4/29/83

- 1200 Cascade Returns with water  
1205 Continue construction of well pads  
1210 mix concrete for ballards at MW-106<sup>s</sup>/<sub>D</sub>  
1230 pour concrete into MW-106<sup>s</sup> and push outer well casing into concrete slurry.  
1310 Complete MW-106<sup>s</sup> pad. Begin on MW-106D  
1315 pour concrete into MW-106D and push outer casing into concrete slurry  
1345 Complete pad and ballards at MW-106<sup>s</sup>/<sub>D</sub>  
Well tag IDs MW-106D 8008-0528  
MW-106<sup>s</sup> 8008-0527  
1420 Begin construction at MW-105  
1425 pour concrete into MW-105 and push outer casing into concrete slurry  
1500 Complete pad and ballards on MW-105  
1505 Cascade takes trash to dumpster  
1535 MW-104D WL TOC: 29.20  
Begin development at MW-106D

4/29/23

19

pH	Temp	Cond	Turb	Amount
7.8	20.6	312	N/A	~ 5
7.4	17.5	347	N/A	~ 2
7.5	17.2	341	N/A	~ 4
7.5	17.0	334	N/A	~ 5
DRY				~ 6 gal

1600 MW-106D Dry pull up pump development completed.

MW-105 8008-0529

1610 Drill weep holes into outer casing

1625 Cascade load last of equipment

1645 All personnel offsite

~~4/29/23~~



20 4/30/23

J. Frasher

Sunday April 30<sup>th</sup> 2023

51-60, sunny, windy

Slug testing

Josh Frasher

0800 Arrive on site

0810 Check water levels

MW-105 WL: 7.59 TD: 33.76

MW-106S WL: 19.47 TD: 41.66

MW-106D WL: 23.85 TD: 66.35

0820 Set up for slug test at MW-105

~~0825~~ Begin slug test

* measurements from	well	pad.
MW-106S	outer casing	well casing
	<del>2.53 FT</del> 2.80 FT	2.55 FT

MW-106D 2.76 FT 2.53 FT

MW-105 2.79 FT 2.53 FT

1225 Complete MW-105 slug test.

1227 pull up and load up.

1245 off site

*Josh* 4/30/23

5/1/23

J. Frasher 21

Monday May 1<sup>st</sup>, 2023

50-63, partly sunny, windy

Slug Testing

Josh Frasher

0725 Arrive on site

0735 MW-106S WL: 19.53

MW-106D WL: 23.63

0740 Setup for slug test

0752 Begin slug test on MW-106S

0845 Finish MW-106S slug test

pull up diver

0850 Download data and setup for MW-106D slug test

0857 Begin MW-106D slug test

1150 Complete MW-106D slug test

pull up diver and download data.

1155 Setup for MW-2 slug test  
WL: 24.61

1200 Begin slug test on MW-2

Slug sizes 3" x 32 3/4"

1.5" x 32.5"

1400 Pull up diver and complete slug test. Download data.

1415 off site

1435 Drop off samples for shipping via

FedEx Trk #: 6426 896 4609

*Josh Frasher*

22 5/1/23

1000 at wha / unload

1025 Scan documents

~~5/1/23~~

23

## **APPENDIX E – DRILL LOGS**



# Drilling Log

Project Name BREC Green LF MW-2 Characterization		Project No. 156465 Location BREC Sebree Station; Green CCR LF			Boring Number <b>MW-105</b>		
Ground Elevation 378.9 ft. amsl		Northing 479265.66 Easting 1493006.72		Latitude 37°38'12.60" Longitude 87°30'03.34"		Page 1 of 3	
TOC Elevation 381.8 ft. amsl		Air Monitoring Equipment 4- Gas Meter & Personal H2S			Total Footage 32 feet		
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Roto-Sonic	6"	31 ft	1 ft	4	NA	12.35 ft	5-19-23
Drilling Company Cascade Drilling LLC				Driller(s) Russ Gordon			
Drilling Rig Geoprobe 8140LC				Type of Sampler 4" Tube Core Barrel			
Date 4-25-23			To 4-26-23		Field Observer(s) J. Frasher & C. Hoglund		

Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
378	1		CH	1 5/5 100%		Clay some silt, trace fine sand, medium plasticity, dark yellowish brown 10YR 3/4. Roots near top some organic medium to high plasticity.	1	2" diameter Sch. 40 PVC well riser. High Solids Bentonite Grout Slurry (placed 4/26/2023)	4" sonic casing sequentially overridden by 6" override casing
377	2						2		
376	3		OH			Roots/ Organic	3		
375	4						4		
374	5	NA		2			5		
373	6			4.5/5 90%			6		
372	7				NA		7		
371	8		CH			Clay with silt some fine sand, medium plasticity medium to high stiffness dark yellowish, Brown 10YR 3/4.	8		
370	9						9		
369	10			3			10		
368	11						11		
367	12						12		
366	13			7/10 70%			13		
365								▼	

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 8/1/23

# Drilling Log, continued

Project Name BREC Green LF MW-2 Characterization							Boring Number MW-105		
Project Number 156465							Page 2 of 3		
							Date 4-25-23		
Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
364	15		CH			Clay with silt some fine sand, medium plasticity medium to high stiffness dark yellowish, Brown 10YR 3/4.	15		Collected MW-105 Soil sample (15 - 17)
363	16		CH		Same as above. High Plasticity & some moisture.	16			
362	17		CH		Clay with some silt. Trace fine sand. High plasticity. Some moisture, very dark grey 2.5 Y3/1. Medium to high stiffness.	17			
361	18						18	Bentonite Seal (3/8" bentonite pellets; placed 4/25/2023 and hydrated overnight)	
360	19						19		
359	20			4			20	10' screen; 2" diameter Sch. 40 PVC; 0.01" machine-slotted. Filter Pack sand (placed 4/25/2023)	
358	21						21		
357	22	NA			NA		22		
356	23			10/10 100%			23		
355	24						24		
354	25						25	Collected MW-105 Soil sample (23 - 25)	
353	26		CH			Clay with some silt. Trace fine sand. High to very high plasticity. Moist grayish brown 10YR 5/2. High stiffness.	26		
352	27						27		
351	28						28		
350	29						29		
349	30			5			30	Collected MW-105 Soil sample (28 - 30)	
348				2/2 100%					

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 8/1/23

# Drilling Log, continued

Project Name BREC Green LF MW-2 Characterization							Boring Number MW-105		
Project Number 156465							Page 3 of 3		
Date 4-25-23									
Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
347	32				NA	Weathered sandstone. Fine to very fine grained sand. Light tan color. Some iron staining.	32		Collected MW-105 Soil sample (31 - 32)
						Bottom @ 32.00 ft			6" override casing tripped out during well installation/construction.
346	33						33		
345	34						34		
344	35						35		
343	36						36		
342	37						37		
341	38						38		
340	39	NA					39		
339	40						40		
338	41						41		
337	42						42		
336	43						43		
335	44						44		
334	45						45		
333	46						46		
332	47						47		
331									

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23



# Drilling Log

Project Name BREC Green LF MW-2 Characterization		Project No. 156465 Location BREC Sebree Station; Green CCR LF			Boring Number <b>MW-106S</b>		
Ground Elevation 384.8 ft. amsl		Northing 479027.34 Easting 1492997.32		Latitude 37°38'10.24" Longitude 87°30'03.41"		Page 1 of 3	
TOC Elevation 387.3 ft. amsl		Air Monitoring Equipment 4- Gas Meter & Personal H2S			Total Footage 40 feet		
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Roto-Sonic	8"	40 ft	0 ft	2	NA	9.19 ft	5-19-23
Drilling Company Cascade Drilling LLC				Driller(s) Russ Gordon			
Drilling Rig Geoprobe 8140LC				Type of Sampler 4" Tube Core Barrel			
Date 4-26-23			To 4-26-23		Field Observer(s) J. Frasher & C. Hoglund		

Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
384	1		CH	1 4/5 80%		Clay with some silt, trace fine sand, trace fine gravel. Medium to high plasticity medium to high stiffness. brown 10YR 4/3. Some iron stained lenses	1	2" diameter Sch. 40 PVC well riser. High Solids Bentonite Grout Slurry (placed 4/26/2023)	4" sonic casing sequentially overridden by 6" override casing; and then by 7" override casing.
383	2						2		
382	3						3		
381	4						4		
380	5	NA	CH	2		Same as above. trace to some coarse gravel. Some form staining. Rock in core barrel resulted in low recovery.	5		
379	6			1.5/5 30%			6		
378	7				NA		7		
377	8						8		
376	9						9		
375	10						10		
374	11						11		
373	12		CH			Clay trace silt. High plasticity medium stiffness dark grey 10YR 4/1. Trace to some iron staining.	12		
372	13			10/10 100%			13		
371									

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23

# Drilling Log, continued

Project Name BREC Green LF MW-2 Characterization							Boring Number MW-106S			
Project Number 156465							Page 2 of 3			
							Date 4-26-23			
Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes	
370	15		CH			Clay trace silt. High plasticity medium stiffness dark grey 10YR 4/1. Trace to some iron staining.	15			
369	16		CH			Clay with trace to some silt trace fine sand. grey streaking dark yellowish brown 10YR 3/6. Medium plasticity medium stiffness.	16			
368	17						17			
367	18						18			
366	19						19			
365	20		CH	4		Clay trace silt, high plasticity medium stiffness. Brown 10YR 5/3.	20			
364	21					Consistency remains the same throughout changing to a slighty dark brown.	21			
363	22	NA			NA		22			
362	23			10/10 100%		More iron staining present	23			
361	24						24			
360	25		CH			Same as above. Medium to high stiffness. Less iron staining present.	25	Bentonite Seal (3/8" bentonite pellets; placed 4/26/2023 and hydrated 2-hours)	Collected MW-106S+DUP-1 Soil sample (23 - 25)	
359	26						26			
358	27						27			
357	28						28			
356	29						29			
355	30		CH	5		Clay trace to some silt. Trace fine sand. High plasticity medium stiffness. Dark grey 10YR 4/1.	30			
354										

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23

# Drilling Log, continued

Boring Number **MW-106S**

Project Name **BREC Green LF MW-2 Characterization**

Page **3 of 3**

Project Number **156465**

Date **4-26-23**

Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes	
353	32		CH			Clay trace to some silt. Trace fine sand. High plasticity medium stiffness. Dark grey 10YR 4/1.	32	10' screen; 2" diameter Sch. 40 PVC, 0.01" machine-slotted. Filter Pack sand (placed 4/26/2023)		
352	33			10/10 100%			33			
351	34						34			
350	35				NA	Same as above.	35			
349	36						36			
348	37						37			
347	38		GM-GC			Transition to coarse gravel with some fine sand trace to some clay and silt. Dark grey. No plasticity medium to low stiffness.	38			Collected MW-106S Soil sample (37 - 39)
346	39	NA					39			
345	40					Bottom @ 40.00 ft	40			
344	41						41			Both 7" and 6" override casings tripped out during well installation/construction.
343	42						42			
342	43						43			
341	44						44			
340	45						45			
339	46						46			
338	47						47			
337										

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23



# Drilling Log

Project Name BREC Green LF MW-2 Characterization		Project No. 156465 Location BREC Sebree Station; Green CCR LF			Boring Number <b>MW-106D</b>		
Ground Elevation 385.3 ft. amsl		Northing 479033.25 Easting 1492996.71		Latitude 37°38'10.30" Longitude 87°30'03.41"		Page 1 of 4	
TOC Elevation 387.9 ft. amsl		Air Monitoring Equipment 4- Gas Meter & Personal H2S			Total Footage 64 feet		
Drilling Type	Hole Size	Overburden Footage	Bedrock Footage	No. Of Samples	No. Core Boxes	Depth to Water	Date Measured
Roto-Sonic	8"	42 ft	22 ft	2	5	16.55 ft	5-19-23
Drilling Company Cascade Drilling LLC				Driller(s) Russ Gordon			
Drilling Rig Geoprobe 8140LC				Type of Sampler 4" Tube Core Barrel			
Date 4-27-23		To 4-28-23		Field Observer(s) J. Frasher			

Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
385	1		OH	1		Top soil organic	1	2" diameter Sch. 40 PVC well riser. High Solids Bentonite Grout Slurry (placed 4/28/2023)	4" sonic casing sequentially overridden by 6" override casing; and then by 7" override casing.
384	2		CH	2/10 20%		Clay with some silt, trace fine sand. Medium plasticity medium stiffness dark yellowish, brown 10YR 4/4. Low to medium moisture.	2		
383	3						3		
382	4						4		
381	5	NA					5		
380	6						6		
379	7						7		
378	8				NA		8		
377	9						9		
376	10						10		
375	11		CH	2		Clay trace to some silt high plasticity high moisture medium stiffness. Light olive brown 2.5Y 5/4.	11		
374	12						12		
373	13			5/10 50%			13		
372								Centralizer (9ft bgs)	

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23

# Drilling Log, continued

Boring Number **MW-106D**

Project Name **BREC Green LF MW-2 Characterization**

Page **2 of 4**

Project Number **156465**

Date **4-27-23**

Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
371			CH			Clay trace to some silt high plasticity high moisture medium stiffness. Light olive brown 2.5Y 5/4.			
	15		CH			Clay with silt trace fine sand trace fine to coarse gravel medium to high stiffness dark yellowish brown 10YR 4/4 medium plasticity medium moisture.	15		
370							16		
	16						17		
369							18		
	17						19		
368							20		
	18						21		
367							22		
	19						23		
366							24		
	20		CH	3		Clay with trace silt low to medium stiffness. Iron staining present throughout yellowish brown 10YR 5/4 medium moisture high plasticity.	25		
365							26		
	21						27		
364							28		
	22	NA			NA		29		
363				10/10 100%			30		
	23						31		
362							32		
	24						33		
361							34		
	25		CH			Same as above trace iron staining high stiffness medium to high plasticity.	35		
360							36		
	26						37		
359							38		
	27						39		
358							40		
	28						41		
357							42		
	29						43		
356							44	Centralizer (29ft bgs)	
	30						45		
355				4			46		

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 6/1/23

# Drilling Log, continued

Project Name BREC Green LF MW-2 Characterization							Boring Number MW-106D		
Project Number 156465							Page 3 of 4		
							Date 4-27-23		
Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
354			CH			Clay trace silt high plasticity medium stiffness dark grey 2.5Y 4/11.			
	32						32		
353				10/10 100%					
	33						33		
352									
	34						34		
351									
	35						35		
350									
	36						36		
349									
	37						37		
348									
	38						38		
347									
	39	NA	GM-GC		NA	Sand with gravel fine to coarse sand/ gravel dark grey 2.5Y 4/1 trace to some clay and silt none to trace plasticity.	39		Centralizer (39ft bgs)
346									
	40			5			40		
345									
	41			2.5/5 50%			41		
344									
	42					Interbedded sandstone and shale. Weathered shale bluish grey color. Soft fine grained sandstone breaks easily micaceous, pyrite and tan color.	42		
343									
	43						43		
342									
	44						44		
341									
	45			6		Tan light iron stained sandstone fine grained micaceous.	45		Terminated 7" override casing at 45 ft bgs.
340									
	46						46		
339				3/5 60%					
	47						47		
338									

LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC\_SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 8/1/23

# Drilling Log, continued

Project Name BREC Green LF MW-2 Characterization							Boring Number MW-106D		
Project Number 156465							Page 4 of 4		
							Date 4-27-23		
Elev. (ft msl)	Depth (ft)	Blow Counts	USCS Symbol	Recov. & Run Time	PID Rdg.	Description	Depth (ft)	Well Diagram	Remarks/ Notes
337						Dark grey shale.			
	49					Grey sandstone fine grained micaceous; some organic streaking/ layers throughout.	49		Centralizer (49ft bgs)
	50			7		Iron stained band (0.7' ft thick)	50		
	51			3.5/5 70%		Dark grey shale	51		
	52					Dark grey shale	52		Collected MW-106D Soil sample (51 - 53)
	53					Grey micaceous sandstone. Fine grained some organic streaking/ layers throughout.	53		
	54					Same as above	54		
	55			8		Same as above	55		
	56	NA		5/5 100%	NA	Iron stained band	56		
	57					Iron stained band	57		
	58						58		
	59						59		Collected MW-106D Soil sample (58 - 60)
	60			9			60		
	61			2/4 50%			61		
	62						62		
	63					Sandstone with some thin shale layers.	63		
	64					Bottom @ 64.00 ft	64		Both 7" and 6" override casings tripped out during well installation/construction

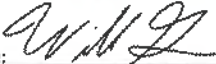


LOG/MONITOR WELL DIAGRAM - ENV1\_CM\_NI\_BREC SEBREE\_2023\_REV 1.GPJ WILLIAMS.GDT 8/1/23

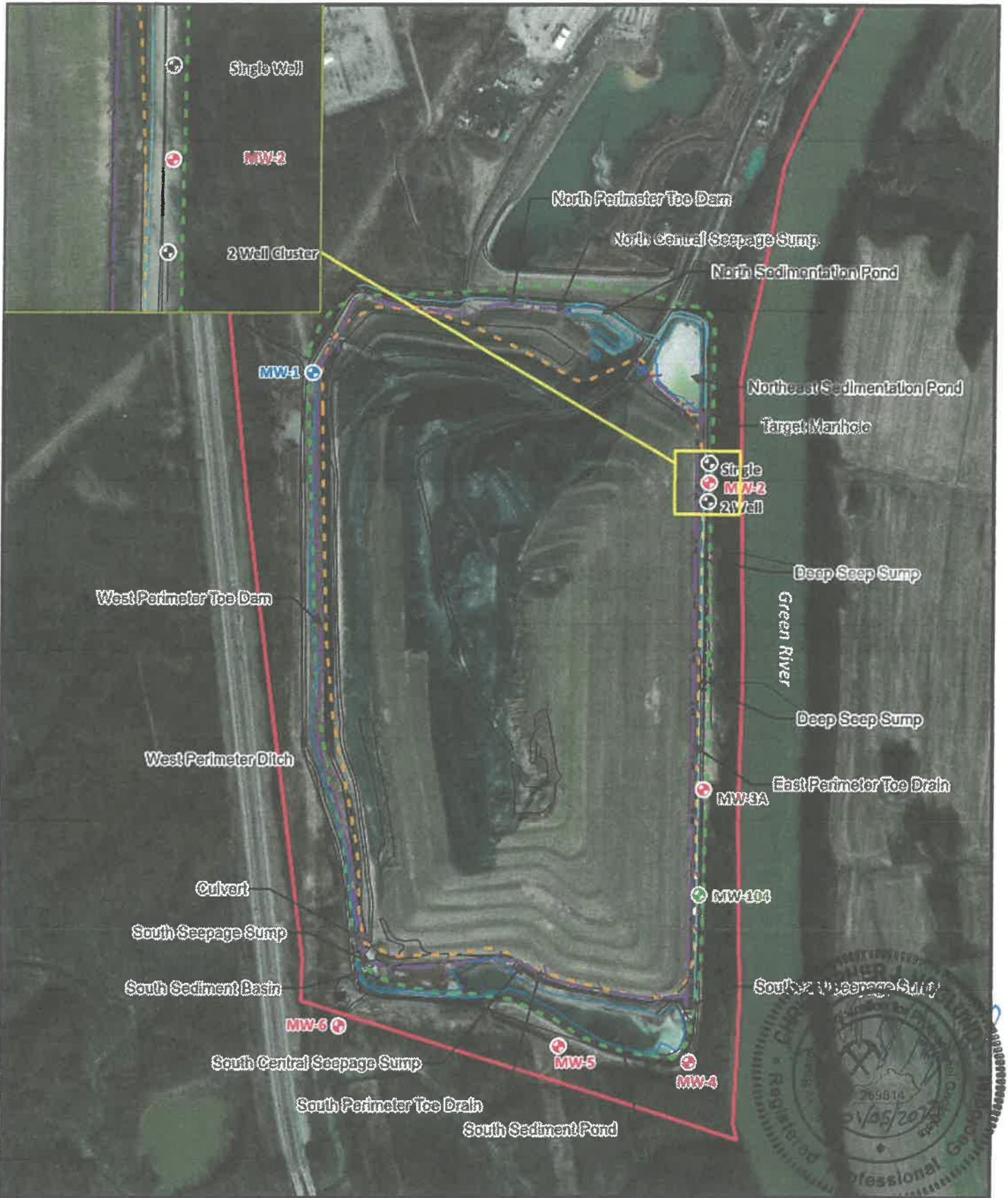
Bentonite Seal  
(3/8" bentonite pellets; placed 4/27/2023 and hydrated overnight)

10' screen; 2" diameter Sch. 40 PVC; 0.01" machine-slotted. Filter Pack sand (placed 4/27/2023)



**APPENDIX F – KENTUCKY MONITORING WELL VARIANCE REQUEST**

<b>KENTUCKY MONITORING WELL VARIANCE REQUEST</b>			
Pursuant to 401 KAR 6:350 Section 1			
Energy and Environment Cabinet, Division of Water, 300 Sower Boulevard, 3 <sup>rd</sup> floor, Frankfort, KY 40601 502-564-3410			
GENERAL INFORMATION		WELL LOCATION	
Requested By: <b>William Gordon</b>	Received By: <b>Adam Smith</b>	Quadrangle:	Code:
Driller Certification Number: <b>0492 - 0549 -00</b>	Date of Request: <b>April 20, 2023</b>	County:	Code:
Drilling Company: <b>Cascade Drilling LP</b>	Time of Request: <b>14:28</b>	AI Number:	
<b>WELL OWNER IDENTIFICATION</b>		AKGWA Number: -	Latitude (dd): N      * Longitude: W -      °
Well Owner: <b>Big Rivers Electric Coop. Mark Bertram</b>	Telephone: <b>(270) 844 5708</b>	<b>EFFECTIVE DATES</b>	
Address: <b>9000 Highway 2096</b>	Email: <b>Mark.Bertram@bigrivers.com</b>	Well Construction Date:	
City, State: <b>Robards, KY</b>	Zip Code: <b>42452</b>	Well Must be Completed	
<b>REASON FOR VARIANCE</b>		On or Before:	
Attach All Supporting Documentation, 401KAR 6:350 Section 1(6)(a)		<b>WELL CHARACTERISTICS</b>	
<b>Use of lubricant Thread Armour TJC on pipe threads of drilling rods during monitoring well drilling</b>		Soil Thickness:	ft.      Estimated      Exact
<input type="checkbox"/> Blanket Variance for monitoring well installed in <30 ft. unconsolidated materials		Depth to Bedrock:	ft. <input type="checkbox"/> <input type="checkbox"/>
Applicable Regulation: <b>401 KAR 6:350</b>	Section: <b>Section 3 (3)</b>	Water-Bearing Units:	ft. <input type="checkbox"/> <input type="checkbox"/>
		Type of Bedrock:	
WELL CONSTRUCTION OR ABANDONMENT REQUIREMENTS			
<input type="checkbox"/> 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.			
<input type="checkbox"/> 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.			
<input type="checkbox"/> The Division of Water is issuing you a onetime temporary monitoring well (construction or abandonment) variance due to			
This variance is for approval of: <b>Use of lubricant Thread Armour TJC on pipe threads of drilling rods during monitoring well drilling</b>			
For wells installed at: <b>Big Rivers Sebree Station Green Landfill</b>			
Please include a copy of this variance request with the plugging record you submit.			
CASING AND SCREEN INFORMATION			
From:	To:	Hole Diameter:	in. Outer Casing Diameter:      in. Material:
From:	To:	Hole Diameter:	in. Inner Casing Diameter:      in. Material:
From:	To:	Hole Diameter:	in. Screen Diameter:      in. Material:
SEALING MATERIAL REQUIREMENTS FOR PLUGGING		ADDITIONAL REQUIREMENTS	
Sealing Material Type:		Sketch Map must be provided:	
From:	To:	Method:	<b>For three (3) characterization groundwater monitoring wells near MW-2 (Green LF)</b>
From:	To:	Method:	
THIS VARIANCE IS NOT VALID UNLESS SIGNED BY THE CERTIFIED MONITORING WELL DRILLER AND THE WELL OWNER			
DRILLER AFFIRMATION		WELL OWNER 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.		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: 	Date: <b>4-25-23</b>	Signature: 	Date: <b>4-28-23</b>
DIVISION OF WATER AFFIRMATION			
Signature: 	Date: <b>4/25/23</b>		



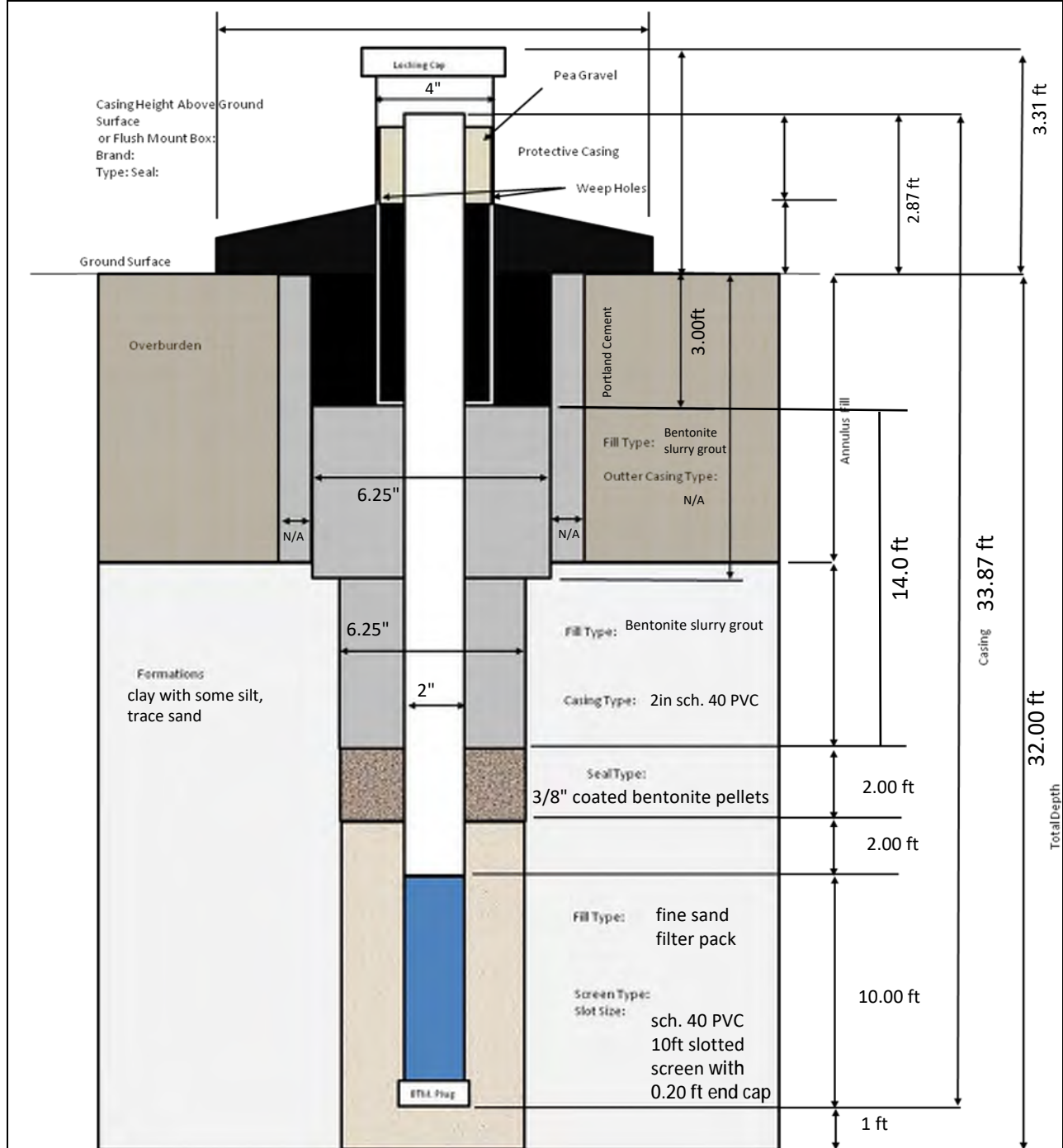
**Figure 3**  
**Proposed Monitoring**  
**Well Location Map**  
**Green Landfill**  
**Webster County, Kentucky**



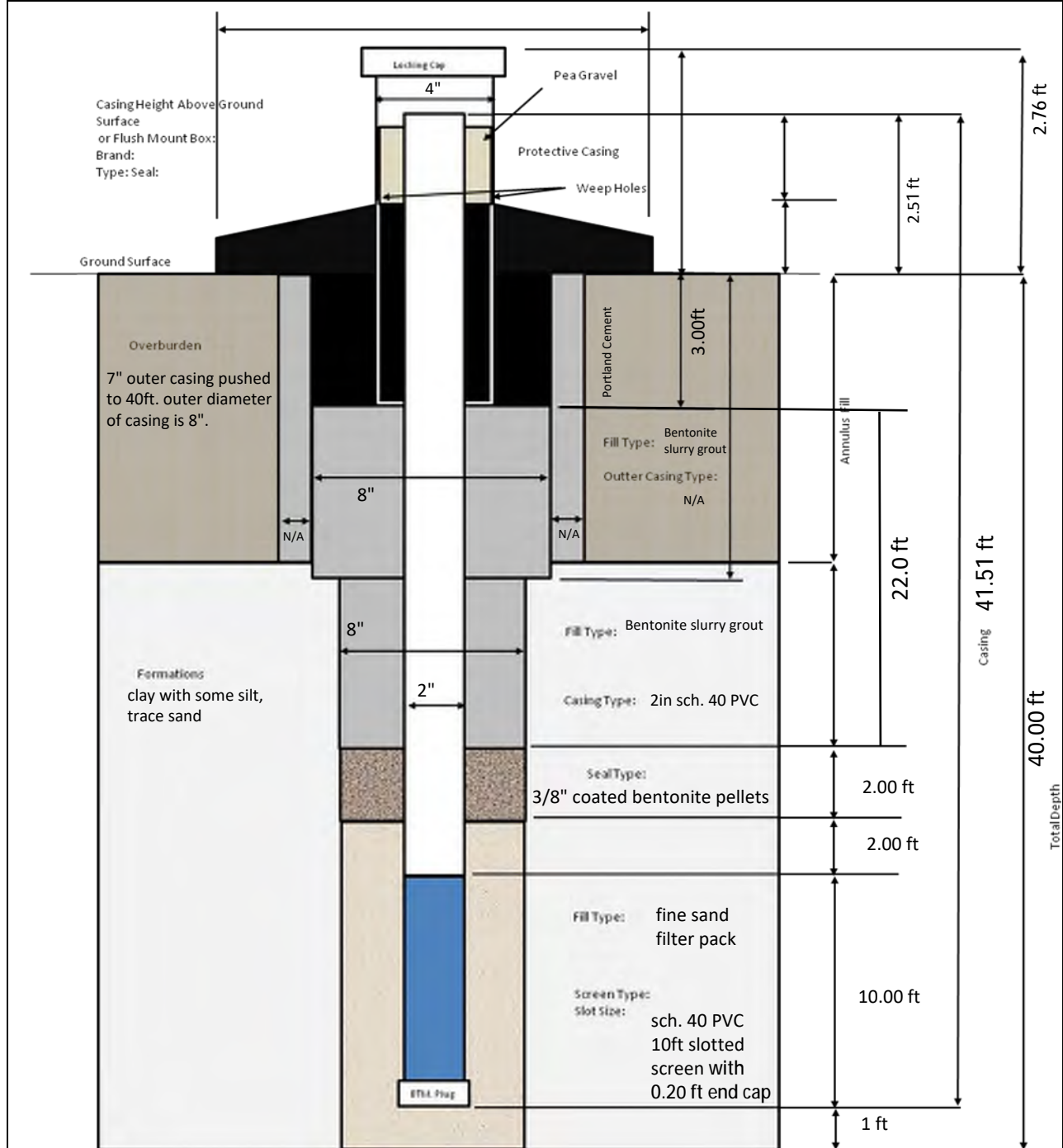
**APPENDIX G – MONITORING WELL CONSTRUCTION DIAGRAMS**



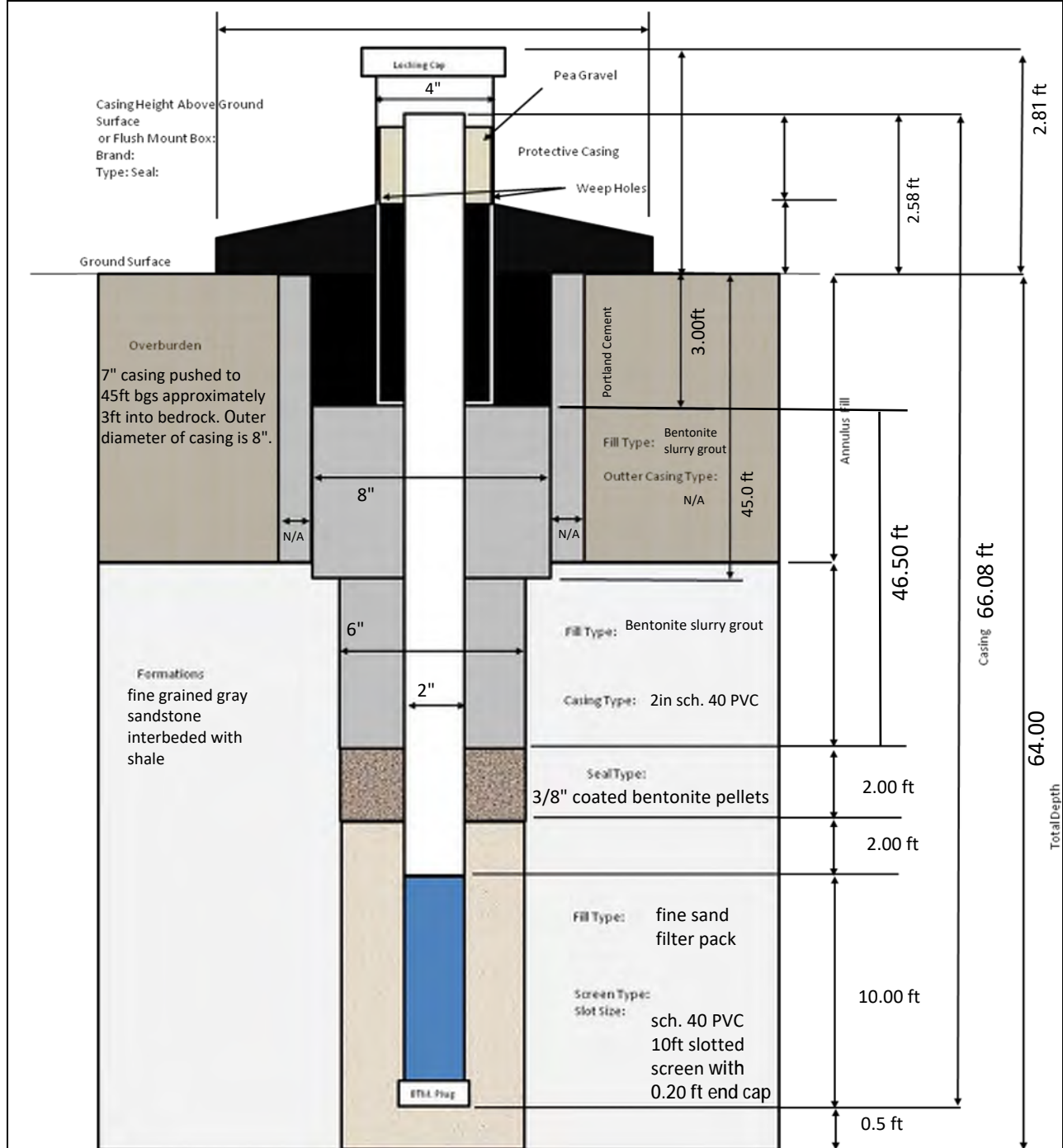
<b>Project #</b> 156465	<b>Date Installed</b> 4/26/23	<b>Well ID#</b> MW-105 8008-0529
<b>Client</b> Big Rivers Electric Corporation	<b>Location</b> BREC Green Station	<b>Installed By</b> Cascade Drilling LLC.
<b>Ground Elevation</b> 378.90 ft	<b>Top of Casing Elevation</b> 381.77 ft	<b>Bottom of Boring Elevation</b> 346.90 ft



<b>Project #</b> 156465	<b>Date Installed</b> 4/26/23	<b>Well ID#</b> MW-106S 8008-0527
<b>Client</b> Big Rivers Electric Corporation	<b>Location</b> BREC Green Station	<b>Installed By</b> Cascade Drilling LLC
<b>Ground Elevation</b> 384.75 ft	<b>Top of Casing Elevation</b> 387.26 ft	<b>Bottom of Boring Elevation</b> 344.75 ft



<b>Project #</b> 156465	<b>Date Installed</b> 4/28/23	<b>Well ID#</b> MW-106D 8008-0528
<b>Client</b> Big Rivers Electric Corporation	<b>Location</b> BREC Green Station	<b>Installed By</b> Cascade Drilling LLC
<b>Ground Elevation</b> 385.30 ft	<b>Top of Casing Elevation</b> 387.88 ft	<b>Bottom of Boring Elevation</b> 321.30 ft



**APPENDIX H – 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 362656 and was submitted on June 06, 2023 06:17 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

<b>Purpose of the application(*)</b> <p><b>Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (<a href="https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp">https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp</a>) If you still need one, contact <a href="mailto:DOWDrillersProgram@ky.gov">DOWDrillersProgram@ky.gov</a> (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.</b></p> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Install only</b> <span style="float: right;">▼</span> </div>		
<b>Kentucky Well ID (AKGWA) Number(*)</b> Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record. <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>8008-0529</b> </div>	<b>Owner Well ID#</b> <div style="border: 1px solid #ccc; height: 25px; width: 100%;"></div> <b>Reference Point</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <span style="float: right;">▼</span> </div>	<b>Well use(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Monitoring well - an</b> <span style="float: right;">▼</span> </div>
<b>Monitoring Well Info</b>		
<b>Wellhead</b>		
<b>Manhole cover and gasket ?(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No</b> <span style="float: right;">▼</span> </div>	<b>if so, diameter (in):(✓)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>diameter (in)</b> </div>	<b>Dedicated pump(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No pump</b> <span style="float: right;">▼</span> </div>
<b>Flush mount(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No</b> <span style="float: right;">▼</span> </div>	<b>Cap(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Lockable</b> <span style="float: right;">▼</span> </div>	
<b>Owner Name and Address Information</b>		

**Owner Name and Address Information**

"Enter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individual"

<b>Owner Business name(✓)</b> <input type="text" value="Big Rivers Electric Corp"/>	<b>Owner first name(✓)</b> <input type="text" value="Owner first nan"/>	<b>Owner middle initial</b> <input type="text" value="Middle i"/>	<b>Owner last name(✓)</b> <input type="text" value="Owner last nar"/>
<b>Owner address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Owner city(*)</b> <input type="text" value="Robards"/>	<b>Owner state(*)</b> <input type="text" value="Kentucky"/>	<b>Owner zipcode(*)</b> <input type="text" value="42452"/>
<b>Owner telephone:(*)</b> <input type="text" value="270-521-7927"/>			

**Site Name, Address and Agency Information**

Please check the checkbox if site address is same as the owner address

<b>Agency Interest (AI) Number:</b> <input type="text" value="AI #; leave blank if unl"/>	<b>Program type</b> <input type="text" value=""/>	<b>Permit or ID Number</b> <input type="text" value=""/>
<b>Site Name(*)</b> <input type="text" value="Big Rivers Electric Corp"/>	<b>Site telephone:</b> <input type="text" value="###-###-####"/>	
<b>Site Address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Site city(*)</b> <input type="text" value="Robards"/>	<b>Site state(*)</b> <input type="text" value="Kentucky"/>
<b>Site zipcode(*)</b> <input type="text" value="42452"/>		

**Supporting Documentation**

<b>Site Map/Sketch Map(✓)</b>	<input type="button" value="Upload file"/>
<b>Well location</b>	<input type="button" value="Upload file"/>
<b>Well Diagram (monitoring well)</b>	<input type="button" value="Upload file"/>
<b>Bacteria analysis (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Approved variance (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Drilling log (optional)</b>	<input type="button" value="Upload file"/>
<b>Other laboratory analysis report (optional)</b>	<input type="button" value="Upload file"/>
<b>Aquifer test results (optional)</b>	<input type="button" value="Upload file"/>
<b>Casing/Screen Supplemental Info (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Other documentation (optional)</b>	<input type="button" value="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:(✓) 
<b>Well Location</b>			
Well latitude(decimal degrees) (*) <u>Driller Viewer</u> ( <a href="http://watermaps.ky.gov/well">http://watermaps.ky.gov/well</a> ) 37.636833	Well longitude(decimal degrees) (*) -87.500928	Method(*) GPS	
USGS 7.5' quadrangle(*) ROBARDS	County(*) Webster	Physiographic region(*) W. Coal Field	
Surface elevation(ft)(*) 381.77	Surface elevation method(*) GPS	Well in flood zone?(*) No	
<b>Construction</b>			
Install start date(*) 4/26/2023		Install end date(*) 4/26/2023	
Drilling method(*) Sonic		Specify drilling method combinations(✓) Specify drilling method combinations	
Drilling method has no annular space(*) No	Multiple screens ?(*) No	Well development method(*) Pumping	Specify development method combinations(✓) Specify development
<b>Surface Completion :</b>			
Protective surface casing(*) Yes	Protective surface casing type(✓) Steel	Protective surface casing height above surface(in)(✓) 30	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 <input type="checkbox"/>		4	2		
36x36x6					
Outer casing(*) No <input type="checkbox"/>	Outer casing type(✓) <input type="checkbox"/>	Outer casing height above surface(in)(✓) <input type="text"/>	Outer casing 2 foot above flood level?(✓) <input type="checkbox"/>		
Inner casing(*) Yes <input type="checkbox"/>	Inner casing type(✓) PVC <input type="checkbox"/>	Inner casing height above surface(in)(✓) 30	Inner casing 2 foot above flood level?(✓) Yes <input type="checkbox"/>		
<b>Please report depths in feet below ground surface,</b>					
Total depth (ft bgs):(*) 32		Depth to bedrock (ft bgs):(✓) <input type="text"/>			
Static water level (ft bgs): <input type="text"/>		SWL method(✓) <input type="checkbox"/>			
<b>Casing/open borehole:</b>					
(*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields					
From Depth (ft) 0.	To Depth (ft) 20.8	Borehole diameter (in) 6.	Casing OD (in) 2.	Casing ID (in) 1.88	Casing Type PVC
<b>Screen:</b>					
From Depth (ft) 20.8	To Depth (ft) 30.8	Borehole diameter (in) 6.	Screen OD (in) 2.	Screen ID (in) 1.88	Screen Type PVC
Screen Slot Size (in) .01					
<b>Annulus fill and seal</b>					
Section	From Depth (ft)	To Depth (ft)	Material		
Grout	3.	17.	Bentonite		
Seal	17.	19.	Bentonite pellets		
Filterpack	19.	32.	Sand		
<b>Lithologic log</b>					
From Depth (ft)	To Depth (ft)	Description			



**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(\*)****6/6/2023****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](#)

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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

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(\*) indicates a required field; (✓) indicates a field may be required based on user input or is an optionally required field

<b>Purpose of the application(*)</b> <p><b>Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (<a href="https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp">https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp</a>) If you still need one, contact <a href="mailto:DOWDrillersProgram@ky.gov">DOWDrillersProgram@ky.gov</a> (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.</b></p> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Install only</b> <span style="float: right;">▼</span> </div>		
<b>Kentucky Well ID (AKGWA) Number(*)</b> <p>Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record.</p> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>8008-0527</b> </div>	<b>Owner Well ID#</b> <div style="border: 1px solid #ccc; height: 20px; width: 100%;"></div> <b>Reference Point</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <span style="float: right;">▼</span> </div>	<b>Well use(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Monitoring well - an</b> <span style="float: right;">▼</span> </div>
<b>Monitoring Well Info</b>		
<b>Wellhead</b>		
<b>Manhole cover and gasket ?(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No</b> <span style="float: right;">▼</span> </div>	<b>if so, diameter (in):(✓)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>diameter (in)</b> </div>	<b>Dedicated pump(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No pump</b> <span style="float: right;">▼</span> </div>
<b>Flush mount(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>No</b> <span style="float: right;">▼</span> </div>	<b>Cap(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 100%;"> <b>Lockable</b> <span style="float: right;">▼</span> </div>	
<b>Owner Name and Address Information</b>		

**OWNER NAME AND ADDRESS INFORMATION**

"Enter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individual"

<b>Owner Business name(✓)</b> <input type="text" value="Big Rivers Electric Corp"/>	<b>Owner first name(✓)</b> <input type="text" value="Owner first nan"/>	<b>Owner middle initial</b> <input type="text" value="Middle i"/>	<b>Owner last name(✓)</b> <input type="text" value="Owner last nar"/>
<b>Owner address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Owner city(*)</b> <input type="text" value="Robards"/>	<b>Owner state(*)</b> <input type="text" value="Kentucky"/>	<b>Owner zipcode(*)</b> <input type="text" value="42452"/>
<b>Owner telephone:(*)</b> <input type="text" value="270-521-7927"/>			

**Site Name, Address and Agency Information**

Please check the checkbox if site address is same as the owner address

<b>Agency Interest (AI) Number:</b> <input type="text" value="AI #; leave blank if unl"/>	<b>Program type</b> <input type="text" value=""/>	<b>Permit or ID Number</b> <input type="text" value=""/>
<b>Site Name(*)</b> <input type="text" value="Big Rivers Electric Corp."/>	<b>Site telephone:</b> <input type="text" value="###-###-####"/>	
<b>Site Address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Site city(*)</b> <input type="text" value="Robards"/>	<b>Site state(*)</b> <input type="text" value="Kentucky"/>
<b>Site zipcode(*)</b> <input type="text" value="42452"/>		

**Supporting Documentation**

<b>Site Map/Sketch Map(✓)</b>	<input type="button" value="Upload file"/>
<b>Well location</b>	<input type="button" value="Upload file"/>
<b>Well Diagram (monitoring well)</b>	<input type="button" value="Upload file"/>
<b>Bacteria analysis (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Approved variance (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Drilling log (optional)</b>	<input type="button" value="Upload file"/>
<b>Other laboratory analysis report (optional)</b>	<input type="button" value="Upload file"/>
<b>Aquifer test results (optional)</b>	<input type="button" value="Upload file"/>
<b>Casing/Screen Supplemental Info (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Other documentation (optional)</b>	<input type="button" value="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:(✓) 
<b>Well Location</b>			
Well latitude(decimal degrees) (*) <u>Driller Viewer</u> ( <a href="http://watermaps.ky.gov/well">http://watermaps.ky.gov/well</a> ) 37.636178	Well longitude(decimal degrees) (*) -87.500928	Method(*) GPS	
USGS 7.5' quadrangle(*) ROBARDS	County(*) Webster	Physiographic region(*) W. Coal Field	
Surface elevation(ft)(*) 387.26	Surface elevation method(*) GPS	Well in flood zone?(*) No	
<b>Construction</b>			
Install start date(*) 4/26/2023		Install end date(*) 4/27/2023	
Drilling method(*) Sonic		Specify drilling method combinations(✓) Specify drilling method combinations	
Drilling method has no annular space(*) No	Multiple screens ?(*) No	Well development method(*) Pumping	Specify development method combinations(✓) Specify development
<b>Surface Completion :</b>			
Protective surface casing(*) Yes	Protective surface casing type(✓) Steel	Protective surface casing height above surface(in)(✓) 30	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	



<input type="text" value="Yes"/>		<input type="text" value="3"/>	<input type="text" value="2"/>		
<input type="text" value="36x36x6"/>					
<b>Outer casing(*)</b> <input type="text" value="No"/>	<b>Outer casing type(✓)</b> <input type="text"/>	<b>Outer casing height above surface(in)(✓)</b> <input type="text"/>	<b>Outer casing 2 foot above flood level?(✓)</b> <input type="text"/>		
<b>Inner casing(*)</b> <input type="text" value="Yes"/>	<b>Inner casing type(✓)</b> <input type="text" value="PVC"/>	<b>Inner casing height above surface(in)(✓)</b> <input type="text" value="30"/>	<b>Inner casing 2 foot above flood level?(✓)</b> <input type="text" value="Yes"/>		
<b>Please report depths in feet below ground surface,</b>					
<b>Total depth (ft bgs):(*)</b> <input type="text" value="38.8"/>		<b>Depth to bedrock (ft bgs):(✓)</b> <input type="text"/>			
<b>Static water level (ft bgs):</b> <input type="text"/>		<b>SWL method(✓)</b> <input type="text"/>			
<b>Casing/open borehole:</b> (*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields					
<b>From Depth (ft)</b> <input type="text" value="0."/>	<b>To Depth (ft)</b> <input type="text" value="29.8"/>	<b>Borehole diameter (in)</b> <input type="text" value="6."/>	<b>Casing OD (in)</b> <input type="text" value="2."/>	<b>Casing ID (in)</b> <input type="text" value="1.88"/>	<b>Casing Type</b> <input type="text" value="PVC"/>
<b>Screen:</b>					
<b>From Depth (ft)</b> <input type="text"/>	<b>To Depth (ft)</b> <input type="text"/>	<b>Borehole diameter (in)</b> <input type="text"/>	<b>Screen OD (in)</b> <input type="text"/>	<b>Screen ID (in)</b> <input type="text"/>	<b>Screen Type</b> <input type="text"/>
<b>Screen Slot Size (in)</b> <input type="text" value="29.8"/>	<input type="text" value="38.8"/>	<input type="text" value="6."/>	<input type="text" value="2."/>	<input type="text" value="1.88"/>	<input type="text" value="PVC"/>
<input type="text" value=".01"/>					
<b>Annulus fill and seal</b>					
<b>Section</b> <input type="text" value="Grout"/>	<b>From Depth (ft)</b> <input type="text" value="3."/>	<b>To Depth (ft)</b> <input type="text" value="25."/>	<b>Material</b> <input type="text" value="Bentonite"/>		
<input type="text" value="Seal"/>	<input type="text" value="25."/>	<input type="text" value="27."/>	<input type="text" value="Bentonite pellets"/>		
<input type="text" value="Filterpack"/>	<input type="text" value="27."/>	<input type="text" value="40."/>	<input type="text" value="Sand"/>		
<b>Lithologic log</b>					
<b>From Depth (ft)</b> <input type="text"/>	<b>To Depth (ft)</b> <input type="text"/>	<b>Description</b> <input type="text"/>			

**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(\*)****6/6/2023****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](#)

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 362649 and was submitted on June 06, 2023 06:12 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

<b>Purpose of the application(*)</b> <p><b>Note: If you are reporting anything other than a new installation and have no AKGWA number, search for it here: (<a href="https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp">https://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp</a>) If you still need one, contact <a href="mailto:DOWDrillersProgram@ky.gov">DOWDrillersProgram@ky.gov</a> (mailto:DOWDrillersProgram@ky.gov?subject=Need%20AKGWA%20for%20eForm%20submittal) for an AKGWA number before proceeding.</b></p> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block;">Install only <span style="float: right;">▼</span></div>		
<b>Kentucky Well ID (AKGWA) Number(*)</b> Be sure to check the AKGWA Number against the Owner Well ID# before submitting this record. <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">8008-0528</div>	<b>Owner Well ID#</b> <div style="border: 1px solid #ccc; height: 25px; width: 95%; margin-bottom: 5px;"></div> <b>Reference Point</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 95%;">▼</div>	<b>Well use(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 95%;">Monitoring well - an <span style="float: right;">▼</span></div>
<b>Monitoring Well Info</b>		
<b>Wellhead</b>		
<b>Manhole cover and gasket ?(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">No <span style="float: right;">▼</span></div>	<b>if so, diameter (in):(✓)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">diameter (in)</div>	<b>Dedicated pump(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">No pump <span style="float: right;">▼</span></div>
<b>Flush mount(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">No <span style="float: right;">▼</span></div>	<b>Cap(*)</b> <div style="border: 1px solid #ccc; padding: 2px; display: inline-block; width: 90%;">Lockable <span style="float: right;">▼</span></div>	
<b>Owner Name and Address Information</b>		

**Owner Name and Address Information**

"Enter business name if owner is an organization. Enter first name/middle initial/last name if owner is an individual"

<b>Owner Business name(✓)</b> <input type="text" value="Big Rivers Electric Corp"/>	<b>Owner first name(✓)</b> <input type="text" value="Owner first nan"/>	<b>Owner middle initial</b> <input type="text" value="Middle i"/>	<b>Owner last name(✓)</b> <input type="text" value="Owner last nar"/>
<b>Owner address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Owner city(*)</b> <input type="text" value="Robards"/>	<b>Owner state(*)</b> <input type="text" value="Kentucky"/>	<b>Owner zipcode(*)</b> <input type="text" value="42452"/>
<b>Owner telephone:(*)</b> <input type="text" value="270-521-7927"/>			

**Site Name, Address and Agency Information**

Please check the checkbox if site address is same as the owner address

<b>Agency Interest (AI) Number:</b> <input type="text" value="AI #; leave blank if unl"/>	<b>Program type</b> <input type="text" value=""/>	<b>Permit or ID Number</b> <input type="text" value=""/>
<b>Site Name(*)</b> <input type="text" value="Big Rivers Electric Corp"/>	<b>Site telephone:</b> <input type="text" value="###-###-####"/>	
<b>Site Address(*)</b> <input type="text" value="9000 State Hwy 2096"/>	<b>Site city(*)</b> <input type="text" value="Robards"/>	<b>Site state(*)</b> <input type="text" value="Kentucky"/>
<b>Site zipcode(*)</b> <input type="text" value="42452"/>		

**Supporting Documentation**

<b>Site Map/Sketch Map(✓)</b>	<input type="button" value="Upload file"/>
<b>Well location</b>	<input type="button" value="Upload file"/>
<b>Well Diagram (monitoring well)</b>	<input type="button" value="Upload file"/>
<b>Bacteria analysis (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Approved variance (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Drilling log (optional)</b>	<input type="button" value="Upload file"/>
<b>Other laboratory analysis report (optional)</b>	<input type="button" value="Upload file"/>
<b>Aquifer test results (optional)</b>	<input type="button" value="Upload file"/>
<b>Casing/Screen Supplemental Info (if applicable)</b>	<input type="button" value="Upload file"/>
<b>Other documentation (optional)</b>	<input type="button" value="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:(✓) 
<b>Well Location</b>			
Well latitude(decimal degrees) (*) <u>Driller Viewer</u> ( <a href="http://watermaps.ky.gov/well">http://watermaps.ky.gov/well</a> ) 37.636194	Well longitude(decimal degrees) (*) -87.500947	Method(*) GPS	
USGS 7.5' quadrangle(*) ROBARDS	County(*) Webster	Physiographic region(*) W. Coal Field	
Surface elevation(ft)(*) 387.88	Surface elevation method(*) GPS	Well in flood zone?(*) No	
<b>Construction</b>			
Install start date(*) 4/28/2023		Install end date(*) 4/28/2023	
Drilling method(*) Sonic		Specify drilling method combinations(✓) Specify drilling method combinations	
Drilling method has no annular space(*) No	Multiple screens ?(*) No	Well development method(*) Pumping	Specify development method combinations(✓) Specify development
<b>Surface Completion :</b>			
Protective surface casing(*) Yes	Protective surface casing type(✓) Steel	Protective surface casing height above surface(in)(✓) 30	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	

<input type="text" value="Yes"/>		<input type="text" value="4"/>	<input type="text" value="2"/>		
<input type="text" value="36x36x6"/>					
<b>Outer casing(*)</b> <input type="text" value="No"/>	<b>Outer casing type(✓)</b> <input type="text"/>	<b>Outer casing height above surface(in)(✓)</b> <input type="text"/>	<b>Outer casing 2 foot above flood level?(✓)</b> <input type="text"/>		
<b>Inner casing(*)</b> <input type="text" value="Yes"/>	<b>Inner casing type(✓)</b> <input type="text" value="PVC"/>	<b>Inner casing height above surface(in)(✓)</b> <input type="text" value="30"/>	<b>Inner casing 2 foot above flood level?(✓)</b> <input type="text" value="Yes"/>		
<b>Please report depths in feet below ground surface,</b>					
<b>Total depth (ft bgs):(*)</b> <input type="text" value="64"/>		<b>Depth to bedrock (ft bgs):(✓)</b> <input type="text"/>			
<b>Static water level (ft bgs):</b> <input type="text"/>		<b>SWL method(✓)</b> <input type="text"/>			
<b>Casing/open borehole:</b> (*)Note: When entering a row of data, From Depth, To Depth, Borehole diameter and Casing Type are required fields					
<b>From Depth (ft)</b> <input type="text" value="0."/>	<b>To Depth (ft)</b> <input type="text" value="53.3"/>	<b>Borehole diameter (in)</b> <input type="text" value="6."/>	<b>Casing OD (in)</b> <input type="text" value="2."/>	<b>Casing ID (in)</b> <input type="text" value="1.88"/>	<b>Casing Type</b> <input type="text" value="PVC"/>
<b>Screen:</b>					
<b>From Depth (ft)</b> <input type="text"/>	<b>To Depth (ft)</b> <input type="text"/>	<b>Borehole diameter (in)</b> <input type="text"/>	<b>Screen OD (in)</b> <input type="text"/>	<b>Screen ID (in)</b> <input type="text"/>	<b>Screen Type</b> <input type="text"/>
<b>Screen Slot Size (in)</b> <input type="text" value="53.3"/>	<input type="text" value="63.3"/>	<input type="text" value="6."/>	<input type="text" value="2."/>	<input type="text" value="1.88"/>	<input type="text" value="PVC"/>
<input type="text" value=".01"/>					
<b>Annulus fill and seal</b>					
<b>Section</b> <input type="text" value="Grout"/>	<b>From Depth (ft)</b> <input type="text" value="3."/>	<b>To Depth (ft)</b> <input type="text" value="49.5"/>	<b>Material</b> <input type="text" value="Bentonite"/>		
<input type="text" value="Seal"/>	<input type="text" value="49.5"/>	<input type="text" value="51.5"/>	<input type="text" value="Bentonite pellets"/>		
<input type="text" value="Filterpack"/>	<input type="text" value="51.5"/>	<input type="text" value="64."/>	<input type="text" value="Sand"/>		
<b>Lithologic log</b>					
<b>From Depth (ft)</b> <input type="text"/>	<b>To Depth (ft)</b> <input type="text"/>	<b>Description</b> <input type="text"/>			

**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(\*)****6/6/2023****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](#)

**APPENDIX I - MONITORING WELL DEVELOPMENT FORMS**



**Well Development Summary**  
**Sebree Station - Green CCR Landfill**  
**Robards, KY**

Well Identification	Well Development (gallons and date)			Total Development (gallons and days)	3 Well Volumes (gallons)	3 Borehole Volumes (gallons)	Clear-Low Turbidity During Development?	3 Well Volumes Purged?	3 Borehole Volumes Purged?
<b>Newly Installed Characterization Wells</b>									
MW-105	5 4/27/2023	6.5 4/28/2023	8 4/29/2023	19.5 gallons 3 days	12.26	27.71	No Cloudy Light Brown - Developed Dry	Yes	No
MW-106S	22 4/28/2023	--	--	22 gallons 1 days	13.88	40.32	No Cloudy Brown - Developed Dry	Yes	No
MW-106D	38.75 4/29/2023	--	--	38.75 gallons 1 days	21.38	36.83	No Light Gray - Developed Dry	Yes	Yes

## WELL DEVELOPMENT RECORD

<b>Project Name:</b> Green LF MW Install		<b>Project Number:</b> 156465		<b>Well Number:</b> MW-105						
<b>Project Information</b>				<b>Elevation of Monitoring Well</b>						
Facility Name: BREC Green Station		Ground Surface Elevation (GS): 378.90								
Location: Green CCR Landfill; Robards, Kentucky		Top of Casing Elevation (TOC): 381.77								
<b>Well Information</b>				<b>Borehole Volume Calculation:</b>						
Date Well Installed: 04/26/23		Water Column = 25.05 feet		Filter Pack Porosity = 30%						
Total Depth of Well: 33.87 feet from TOC		1 Well Volume = 4.09 gallons		Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft						
Depth to Top of Screen: 23.67 feet from TOC		3 Well Volume = 12.26 gallons								
Length of Casing Screened: 10.00 feet		1 well volume (gallons) = initial height of water column (ft) x .16								
Borehole Diameter: 6.25 inches		Filter Pack Volume = 5.15 gallons								
Well Casing Diameter: 2.00 inches		Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume								
Type of Formation Screened: Clay w/ Silt		3 Borehole Volume = <b>27.71 gallons</b>								
		3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)								
<b>Development Method</b>										
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. Turbidity value of OOR = out of range of instrument.						
Airlift		Pump	X							
<b>Observations During Development</b>										
Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed		Temp. (°C)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
				Gallons	Total					
04/27/23	2:50:00 PM	8.82	33.76	0.25	0.25	17.8	8.40	1282	OOB	Brown, cloudy
04/27/23	3:10:00 PM	17.26	33.76	2.5	2.5	17.6	8.50	1231	OOB	Brown, cloudy
04/27/23	3:20:00 PM	31.34	33.76	5.0	5.0	17.3	8.10	1211	OOB	Brown, cloudy
04/27/23	3:22:00 PM	Dry			5					Developed Dry
04/28/23	7:40:00 AM	9.96	33.76	1.5	6.5	15.5	6.50	2520	OOB	Brown, cloudy
04/28/23	7:42:00 AM	12.61	33.76	3.0	8.0	15.3	6.50	2330	OOB	Brown, cloudy
04/28/23	7:45:00 AM	26.32	33.76	4.5	9.5	15.1	6.60	2240	OOB	Brown, cloudy
04/28/23	7:50:00 AM	31.45	33.76	6.0	11.0	15.2	6.50	2210	OOB	Brown, cloudy
04/28/23	7:53:00 AM	Dry		6.5	11.5					Developed Dry
04/29/23	7:42:00 AM	9.22	33.76	2.0	13.5	14.8	6.50	1850	OOB	Brown, cloudy
04/29/23	7:48:00 AM	22.32	33.76	4.0	15.5	14.5	6.50	1800	OOB	Brown, cloudy
04/29/23	7:53:00 AM	32.01	33.76	8.0	19.5	14.6	6.50	1650	OOB	light cloudy brown; Developed Dry

\*from TOC unless otherwise noted in Remarks

## WELL DEVELOPMENT RECORD

<b>Project Name:</b> Green LF MW Install		<b>Project Number:</b> 156465		<b>Well Number:</b> MW-106S						
<b>Project Information</b>				<b>Elevation of Monitoring Well</b>						
Facility Name: BREC Green Station		Ground Surface Elevation (GS):		384.75						
Location: Green CCR Landfill; Robards, Kentucky		Top of Casing Elevation (TOC):		387.26						
<b>Well Information</b>				<b>Borehole Volume Calculation:</b>						
Date Well Installed: 04/26/23		Water Column = 28.35 feet		Filter Pack Porosity = 30%						
Total Depth of Well: 41.51 feet from TOC		1 Well Volume = 4.63 gallons		Filter Pack = 12.00 ft      Saturated Filter Pack = 12.00 ft						
Depth to Top of Screen: 31.31 feet from TOC		3 Well Volume = 13.88 gallons		1 well volume (gallons) = initial height of water column (ft) x .16						
Length of Casing Screened: 10.00 feet		Filter Pack Volume= 8.81 gallons		Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume						
Borehole Diameter: 8.00 inches		3 Borehole Volume = 40.32 gallons		3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)						
Well Casing Diameter: 2.00 inches										
Type of Formation Screened: Clay w/ Silt										
<b>Development Method</b>										
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. Turbidity value of OOR = out of range of instrument.							
Airlift		Pump				X				
<b>Observations During Development</b>										
Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed		Temp. (°C)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
				Gallons	Total					
04/28/23	755	13.16	41.66	0.5	0.5	15.2	7.2	556	OOR	cloudy brown
04/28/23	815	19.26	41.66	2.0	2	15.1	7.2	501	OOR	cloudy brown
04/28/23	820	24.56	41.66	5.0	5	14.8	7.2	521	OOR	cloudy brown
04/28/23	825	29.34	41.66	6.0	6	14.3	6.9	743	OOR	cloudy brown
04/28/23	830	34.22	41.66	7.5	7.5	14.5	6.9	709	OOR	cloudy brown
04/28/23	835	39.26	41.66	10.0	10.0	15.6	6.9	740	OOR	light cloudy brown; Developed Dry
04/28/23	1132	18.21	41.66	1.0	11.0	18.4	7.0	712	OOR	cloudy brown
04/28/23	1137	24.73	41.66	2.0	13.0	17.2	6.9	760	OOR	cloudy brown
04/28/23	1143	31.76	41.66	2.0	15.0	16.5	6.8	800	OOR	cloudy brown
04/28/23	1145	39.45	41.66	2.0	17.0	16.2	6.8	812	OOR	cloudy brown; Developed Dry
04/28/23	1425	18.21	41.66	0.50	17.5	18.7	6.8	890	OOR	cloudy brown
04/28/23	1430	27.24	41.66	2.5	20.0	18.1	6.7	887	OOR	cloudy brown
04/28/23	1435	38.4	41.66	2.0	22.0	18.1	6.7	900	OOR	cloudy brown; Developed Dry

\*from TOC unless otherwise noted in Remarks

## WELL DEVELOPMENT RECORD

<b>Project Name:</b> Green LF MW Install		<b>Project Number:</b> 156465			<b>Well Number:</b> MW-106D					
<b>Project Information</b>				<b>Elevation of Monitoring Well</b>						
Facility Name: BREC Green Station				Ground Surface Elevation (GS): 385.300						
Location: Green CCR Landfill; Robards, Kentucky				Top of Casing Elevation (TOC): 387.880						
<b>Well Information</b>				<b>Borehole Volume Calculation:</b>						
Date Well Installed: 04/28/23				Water Column = 43.66 feet		Filter Pack Porosity = 30%				
Total Depth of Well: 66.08 feet from TOC				1 Well Volume = 7.13 gallons		Filter Pack = 12.00 ft Saturated Filter Pack = 12.00 ft				
Depth to Top of Screen: 55.88 feet from TOC				3 Well Volume = 21.38 gallons						
Length of Casing Screened: 10.00 feet				1 well volume (gallons) = initial height of water column (ft) x .16						
Borehole Diameter: 6.25 inches				Filter Pack Volume = 5.15 gallons						
Well Casing Diameter: 2.00 inches				Filter pack volume (gallons) = saturated borehole filter pack volume (assuming 30% porosity) - saturated well filter pack volume						
Type of Formation Screened: Sandstone w/ Shale Interbeds				3 Borehole Volume = <b>36.83 gallons</b>						
				3 Borehole Volumes (gallons) = 3 x (saturated well casing volume + saturated filter pack)						
<b>Development Method</b>										
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. Turbidity value of OOR = out of range of instrument.						
Airlift		Pump								
		X								
<b>Observations During Development</b>										
Date	Time	Depth to Water* (ft)	Total Depth* (ft)	Fluid Removed		Temp. (°C)	pH (units)	S.C. (µS/cm)	Turbidity	Fluid Appearance and Remarks (turbidity, color, odor, etc.)
				Gallons	Total					
04/29/23	730	22.42	66.35	0.50	0.50	14.9	7.9	424	OOB	grey, cloudy
04/29/23	735	62.13	66.35	4.00	4.00	14.6	7.4	518	OOB	grey, cloudy
04/29/23		Dry	66.35	0.5	4.5					Developed Dry
04/29/23	1037	31.62	66.35	0.25	4.75	16.3	7.9	287	OOB	grey, cloudy
04/29/23	1040	42.67	66.35	2.0	6.75	15.9	7.8	284	OOB	grey, cloudy
04/29/23	1047	51.82	66.35	4.0	10.75	15.2	7.5	289	OOB	grey, cloudy
04/29/23	1053	61.48	66.35	5.0	15.75	15.6	7.5	285	OOB	light grey, cloudy
04/29/23		Dry	66.35	5.5	21.25					Developed Dry
04/29/23	1535	29.20	66.35	0.50	21.8	20.60	7.8	312	OOB	grey, cloudy
04/29/23	1540	33.35	66.35	2.0	23.8	17.5	7.6	347	OOB	light grey, cloudy
04/29/23	1545	41.6	66.35	4.0	27.8	17.2	7.5	341	OOB	light grey, cloudy
04/29/23	1550	59.3	66.35	5.0	32.8	17.0	7.5	334	OOB	light grey, cloudy
04/29/23		Dry	66.35	6.0	38.8					Developed Dry
04/29/23										
04/29/23										
04/29/23										

\*from TOC unless otherwise noted in Remarks



**APPENDIX J – MONITORING WELL SURVEY REPORT**



## Big Rivers Electric Corporation Green Station Landfill

Monitoring Well Surveyed Locations  
Surveyed May 19, 2023

Client: Big Rivers Electric Corporation

**Field Surveyor:** Mitch Lander  
**Licensed Surveyor:** James D. Cansler, LPLS  
**Survey Method:** GPS (RTK)  
**Equipment:** Carlson BRX7  
**Control System:** BREC Green Station Landfill Control (Local)  
**Primary Reference Point:** PN 1

Associated Engineers, Inc. (AEI) has been retained by Big Rivers Electric Corporation for the purpose of surveying the location of ten (10) ground water monitoring wells at Big Rivers Electric Corporation's Green Station Landfill. 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 was provided to AEI by the client. Below is the tabulated location information for each well:

Well Number	MW-105	MW-2	MW-106D	MW-106S	MW-3A
Northing	479,265.66	479,137.94	479,033.25	479,027.34	477,478.53
Easting	1,493,006.72	1,492,992.66	1,492,996.71	1,492,997.32	1,493,022.67
Top of Casing Elev.	381.77	391.82	387.88	387.26	386.27
Top of Pad Elev.	378.96	389.51	385.27	384.86	380.55
Ground Elev.	378.90	389.41	385.30	384.75	380.47
Latitude	37°38'12.60"	37°38'11.33"	37°38'10.30"	37°38'10.24"	37°37'54.93"
Longitude	087°30'03.34"	087°30'03.48"	087°30'03.41"	087°30'03.40"	087°30'02.73"
HRMS*	0.067	0.038	0.042	0.075	0.052
VRMS**	0.103	0.081	0.081	0.176	0.125

Well Number	MW-104	MW-4	MW-6	MW-1	MW-5
Northing	476,983.54	476,125.40	476,447.24	479,651.92	476,085.26
Easting	1,492,953.97	1,492,902.40	1,491,223.27	1,490,854.99	1,492,394.76
Top of Casing Elev.	395.40	391.11	388.10	422.56	389.81
Top of Pad Elev.	392.60	388.64	386.24	420.48	387.45
Ground Elev.	392.44	388.62	385.55	420.11	387.28
Latitude	37°37'50.03"	37°37'41.53"	37°37'44.41"	37°38'16.02"	37°37'41.04"
Longitude	087°30'03.47"	087°30'03.91"	087°30'24.85"	087°30'30.17"	087°30'10.21"
HRMS*	0.024	0.030	0.025	0.027	0.049
VRMS**	0.066	0.065	0.041	0.039	0.074

\*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](mailto:jcansler@associatedengineers.com)

  
James D. Cansler, LPLS  
May 31, 2023





CREATE AMAZING.

Burns & McDonnell World Headquarters  
9400 Ward Parkway  
Kansas City, MO 64114  
O 816-333-9400  
F 816-333-3690  
[www.burnsmcd.com](http://www.burnsmcd.com)



**APPENDIX D - GREEN LANDFILL ANALYTICAL SUMMARY  
TABLES**

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY**  
MW-1

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE												6/4/2018	7/10/2018
			3/26/2016	5/23/2016	8/18/2016	10/26/2016	2/1/2017	5/2/2017	8/7/2017	9/5/2017	10/5/2017	6/4/2018	7/10/2018			
			Baseline Events										Assessment	Re-Sampling		
Boron	--	mg/L	1.67	1.49	2.25	1.70	1.71 J	1.68	1.85 B	1.79	1.92	NA	1.41			
Calcium	--	mg/L	29.1	31.8 B	33.0	30.9	20.8	28.1	27.1	29.9 B	26.4	NA	26.5			
Chloride	--	mg/L	9.03 JB	0.501 JB	6.60 B	6.02 B	5.56 B F1	5.30 B	5.12 B F1	5.71 B	4.07 F1 B	NA	6.34 B			
Fluoride	4.0	mg/L	ND J	ND JB	ND J	ND JB	ND J F1	ND JB	ND J F1	ND J	ND J F1	NA	ND J			
pH (Field Measurement)	--	s.u.	7.39	7.24	7.57	7.19	7.63	7.54	7.45	7.48	7.63	NA	7.08			
Sulfate	--	mg/L	25.2	22.8 JB	22.9	20.7 B	28.4	24.0 B	25.3 B	23.4	24.9 JB	NA	23.5			
Total Dissolved Solids	--	mg/L	598	588	585	585	605	630	614	627	636	NA	585			
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.006	mg/L	ND	ND J	ND B	ND	ND	ND JB	0.00297 B	ND JB		ND JB	ND J			
Arsenic	0.01	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J F1	ND JB		ND JB	ND J			
Barium	2.0	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J F1	ND J		ND JB	ND J			
Beryllium	0.004	mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND			
Cadmium	0.005	mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND			
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND J		ND JB	ND			
Cobalt	0.006	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND JB	ND J			
Fluoride	4.0	mg/L	ND J	ND J	ND J	ND JB	ND J F1	ND JB	ND J F1	ND J		ND J	ND J			
Lead	0.015	mg/L	ND J	ND J	ND J	ND	ND	ND	ND	ND J		ND	ND J			
Lithium	0.04	mg/L	0.0293 J	0.0317 J	0.0326 J	0.0286 J	0.0342 J	0.0396 J	0.0314 J	0.0315 J		0.0319 J	0.0298 J			
Mercury	0.002	mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND			
Molybdenum	0.1	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND		ND J	ND J			
Radium 226	5.0	pCi/L	1.05	1.02	0.676	1.02	0.694	0.666	0.491	0.601		1.92	0.882			
Radium 228																
Selenium	0.05	mg/L	ND	ND	ND	ND	ND	ND	ND J	ND		ND	ND			
Thallium	0.002	mg/L	ND	ND J	ND	ND J	ND	ND	ND J	ND		ND	ND			

B = Compound was found in the blank and sample.

D1 = Sample required dilution due to high concentration of target analyte

D2 = Sample required dilution due to matrix interference

F1 = MS and/or MSD Recovery is outside acceptance limits.

GWPS = Groundwater Protection Standard

H1 = Sample analysis performed pasts holding time

H3 = Sample received and analyzed past holding time

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.

mg/L = milligrams per liter

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

M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-1**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																							
			9/28/2018		4/22/2019		9/30/2019		4/6/2020		9/22/2020		4/22/2021		9/23/2021		4/20/2022		12/9/2022		6/22/2023		11/7/2023			
			Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment			
Boron	--	mg/L	1.94	B	1.73	B	1.68	D2,M4	1.69	D1,M3	1.66	D2,M4	1.45	D1,M4	1.68	D1,M1,M4	1.71	D1,M2	1.82	D2,M1	1.92	D1,M1,M2	1.65	D1		
Calcium	--	mg/L	28.5	B	32.1		29.1	D2	27.7	D1,M3	26.4	D2	31.6	D1,M1	26.4	D1,M1	31	D1,M2	31.2	D2,M2	28.6	D1,M1,M2	25.2	D1		
Chloride	--	mg/L	6.17	B	6.41	B,F1	7.5		6.5		6.6		6.4		6.2		13.9		5.7		5.7		5.7			
Fluoride	4.0	mg/L	ND	JB	0.521	J	0.6		0.5		0.6		0.5		0.6		0.5		0.6		0.5		0.6			
pH (Field Measurement)	--	s.u.	8.43		7.87		7.79	H3	7.22		6.88		6.90		7.28		6.67		7.62		8.51		7.94			
Sulfate	--	mg/L	22.5	B	35.1	B,F1	19		21		24		42	D	33	D	48		30		31		30			
Total Dissolved Solids	--	mg/L	616		568	B	444	H1	488		388		582		584		672		602		520		684			
<b>APPENDIX IV CONSTITUENTS</b>																										
Antimony	0.006	mg/L	NA		0.000254	JB	ND	M1 V1 U	<0.005		<0.005		<0.005	U	<0.005	M2, U	<0.005	U	<0.005	U	<0.005	U	<0.005	U		
Arsenic	0.01	mg/L	ND	JB	0.00167	JB	0.0005	V1 J	0.0019		<0.0010		0.0005	J	<0.0010	M1, M2, U	0.0004	J	0.0008	J	0.0005	J	0.0016			
Barium	2.0	mg/L	ND	J	0.0862	J	0.091	D2	0.087		0.077		0.081		0.078	M2	0.077		0.085		0.071		0.079			
Beryllium	0.004	mg/L	NA		0.000533	J	ND	D2 U	<0.0020		<0.0020		<0.0020	U	<0.0020	M2, U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		
Cadmium	0.005	mg/L	NA		0.000299	J	ND	VI U	<0.0010		<0.0010		0.0001	J	<0.0010	M2, U	<0.001	U	<0.001	U	<0.001	U	<0.001	U		
Chromium	0.1	mg/L	NA		0.00354	B	ND	U	0.0011	J	<0.0020		<0.0020	U	<0.0020	M2, U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		
Cobalt	0.006	mg/L	NA		0.000571	J	ND	U	<0.004		<0.004		<0.004	U	<0.004	M2, U	<0.004	U	<0.004	U	<0.004	U	<0.004	U		
Fluoride	4.0	mg/L	ND	JB	0.521	J	0.6		0.5		0.6		0.5		0.6		0.5		0.6		0.5		0.6			
Lead	0.015	mg/L	NA		0.000279	J	ND	V1 U	<0.002		<0.002		<0.002	U	<0.002	M2, U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		
Lithium	0.04	mg/L	0.0279	J	0.0295	J	ND	D2 M3 U	0.03		<0.20	M1	0.03		0.03	M1, M2	0.03		0.03		0.03		0.03			
Mercury	0.002	mg/L	ND		ND		ND	V1 U	<0.0005		<0.0005		<0.0005	U	<0.0005	M1, M2, U	0.0002	J	<0.0005	U	<0.0005	U	<0.0005	U		
Molybdenum	0.1	mg/L	NA		0.00105	J	ND	U	<0.01		<0.01		<0.01	U	<0.01	M1, M2, U	0.002	J	<0.01	U	<0.01	U	<0.01	U		
Radium 226	5.0	pCi/L	0.905		0.689		0.782		0.808		0.564		0.412		1.53		2.36	J	1.46	J	0.805	J	0.176	J		
Radium 228																									0.733	
Selenium	0.05	mg/L	NA		0.00105	J	ND	U	<0.003		<0.003		<0.003	U	<0.003	M2, U	<0.003	M1, U	<0.003	U	<0.003	U	<0.003	U		
Thallium	0.002	mg/L	NA		0.000498	J	0.0001	V1 J	0.0001	J	0.0001	J	<0.0020	U	<0.0020	M1, M2, U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		

B = Compound was found in the blank and sample.  
D1 = Sample required dilution due to high concentration of target analyte  
D2 = Sample required dilution due to matrix interference  
F1 = MS and/or MSD Recovery is outside acceptance limits.  
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M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable  
NA = Not Analyzed  
ND = Not Detected at or above Method Detection Limit  
pCi/L = picocuries per Liter  
s.u. = standard units  
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

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-2**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE											
			3/26/2016	5/23/2016	8/18/2016	11/14/2016	2/1/2017	5/2/2017	8/8/2017	9/7/2017	10/6/2017	6/5/2018	7/11/2018	
			Baseline Events										Assessment	Re-Sampling
Boron	--	mg/L	ND J	ND J	ND J	ND J	ND JB	ND J	0.113 JB	ND JB	ND J	NA	ND J	
Calcium	--	mg/L	119	116 B	140	140 B	126	152	154	121	150	NA	155	
Chloride	--	mg/L	126 B	125 B	129 B	133	142 B	129 B	145 B	136 B	129 B	NA	154 B	
Fluoride	4.0	mg/L	ND J	ND	ND J	ND JB F1	ND J	ND JB	ND JB	ND JB F1	ND J	NA	ND J	
pH (Field Measurement)	--	s.u.	6.81	6.59	6.7	6.78	7.12	7.04	6.77	6.69	6.86	6.64	6.40	
Sulfate	--	mg/L	80.0	84.5 J	85.5 J	90.1	89.8	83.2	92.0 JB	90.8	88.6 JB	NA	107	
Total Dissolved Solids	--	mg/L	764	780	830	880	862	918	913	818	970	NA	884	
<b>APPENDIX IV CONSTITUENTS</b>														
Antimony	0.006	mg/L	ND	ND J	ND JB	ND JB	ND	ND JB	ND B	ND JB	NA	ND JB	ND J	
Arsenic	0.01	mg/L	0.00703 J	0.00633	0.0110	0.0159	0.0462	0.00755	0.0381	0.00527	NA	0.0327 B	0.0119	
Barium	2.0	mg/L	ND J	ND J	0.280	0.319	0.347	0.332	0.308	ND J	NA	0.369	0.323	
Beryllium	0.004	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	
Cadmium	0.005	mg/L	ND J	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND JB	ND	
Cobalt	0.006	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	ND J	NA	ND JB	ND J	
Fluoride	4.0	mg/L	ND J	ND	ND J	ND JB F1	ND J	ND JB	ND JB	ND JB F1	NA	ND J	ND J	
Lead	0.015	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND J	
Lithium	0.04	mg/L	ND J	ND	ND	ND	ND J	ND J	ND JB	ND	NA	ND	ND	
Mercury	0.002	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	
Molybdenum	0.1	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	ND JB	NA	ND J	ND J	
Radium 226	5.0	pCi/L	0.533	ND	0.46	ND	0.856	0.73	0.968	0.537	NA	1.18	0.733	
Radium 228														
Selenium	0.05	mg/L	ND	ND	ND	ND JB	ND	ND	ND JB	ND	NA	ND	ND	
Thallium	0.002	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND	

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

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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

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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



**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-2**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																							
			9/28/2018		4/23/2019		10/1/2019		4/7/2020		9/22/2020		4/22/2021		9/23/2021		4/20/2022		12/10/2022		6/24/2023		11/7/2023			
			Assessment																							
Boron	--	mg/L	0.0630	JB	0.101	JB	ND	D2 U	<0.10		<0.10		<0.10	U	<0.10	U	<0.10	U	<1.0	D2, U	<0.10	U	<0.10	U		
Calcium	--	mg/L	165	B	156		166	D1	145	D1	157	D1	179	D1	193	D1	190	D1	216	D1	192	D1	179	D1		
Chloride	--	mg/L	159	B	144		108	D	120	D	231	D	264	D	301	D	159	D	233	D	218		185	D		
Fluoride	4.0	mg/L	ND	JB	0.193	J	0.3		0.2		0.3		0.2		0.3		0.2		0.2		0.2		0.3			
pH (Field Measurement)	--	s.u.	7.02		7.15		7.39	H3	6.92		6.22		6.69		6.27		6.37		6.92		7.54		7.23			
Sulfate	--	mg/L	108	B	105		79.0	D	85	D	117	D	199	D	205	D	128	D	150		156		159			
Total Dissolved Solids	--	mg/L	937		918	B	930	H1	806		914		1040		1070		1130		1230		1610		1060			
<b>APPENDIX IV CONSTITUENTS</b>																										
Antimony	0.006	mg/L	NA		0.0000670	JB	ND	V1 U	<0.005		<0.005		<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U		
Arsenic	0.01	mg/L	0.0211	B	0.00738	B	0.0129	D2	0.0033		0.0095		0.0259		0.025		0.0331	J	0.0501		0.0323		0.0283			
Barium	2.0	mg/L	0.367		0.362		0.380	D2	0.238		0.336		0.363		0.329		0.348	J	0.351		0.340		0.270			
Beryllium	0.004	mg/L	NA		0.000281	J	ND	D2 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U		
Cadmium	0.005	mg/L	NA		ND		ND	V1 U	<0.0010		<0.0010		<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U		
Chromium	0.1	mg/L	NA		0.00122	JB	ND	D2 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U		
Cobalt	0.006	mg/L	NA		0.00382	J	ND	D2 U	<0.004		<0.004		<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U		
Fluoride	4.0	mg/L	ND	JB	0.193	J	0.3		0.2		0.3		0.2		0.3		0.2		0.2		0.2		0.3			
Lead	0.015	mg/L	NA		ND		ND	V1 U	<0.002		<0.002		<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		
Lithium	0.04	mg/L	ND		ND		ND	D2 VI U	0.007	J	0.006	V1, J	0.006	J	0.006	J	0.006	J	0.006	J	0.006	J	0.005	J		
Mercury	0.002	mg/L	ND		ND		ND	V1 U	<0.0005		<0.0005		<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U		
Molybdenum	0.1	mg/L	NA		0.00210	J	0.003	J	0.002	J	0.002	J	0.003	J	0.002	J	0.003	J	0.003	J	0.003	J	0.005	J		
Radium 226	5.0	pCi/L	0.803		0.391		0.136		0.529		0.493		1.26		0.591		1.27	J	1.59	J	1.50	J	0.001	J		
Radium 228							0.834																			
Selenium	0.05	mg/L	NA		ND		ND	U	<0.003		<0.003		<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U		
Thallium	0.002	mg/L	NA		0.0000800	J	ND	V1 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U		

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V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-3A**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE												Assessment	Re-Sampling
			3/26/2016	5/23/2016	8/18/2016	11/14/2016	2/1/2017	5/2/2017	8/8/2017	9/6/2017	10/6/2017	6/5/2018	7/11/2018			
			Baseline Events													
Boron	--	mg/L	0.145	0.135 J	0.279 J	0.213 J	0.235 JB	0.232 J	0.304 JB	0.376 J	0.313	NA	0.177 J			
Calcium	--	mg/L	431	322 B	362	365 B	327	420	421	438 B	408	NA	469			
Chloride	--	mg/L	2630 HB	3070	2150 B	2150 B	2220 B	2120 B	1790 B	2270 B	1870 B	NA	2180 B			
Fluoride	4.0	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND	3.16	ND J	NA	ND J			
pH (Field Measurement)	--	s.u.	6.92	6.86	6.95	6.75	7.17	7.11	6.81	6.9	6.95	6.84	6.55			
Sulfate	--	mg/L	1330	1330	1190	1660	1080	1030 B	942	1130	1030 B	NA	1010			
Total Dissolved Solids	--	mg/L	4440	5010	4170	4450	4270	5170	5010	5020	5300	NA	4540			
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.006	mg/L	ND	ND J	ND JB	ND JB	ND	ND JB	ND JB	ND JB	NA	ND JB	ND			
Arsenic	0.01	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	NA	ND JB	ND J			
Barium	2.0	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND J	ND J			
Beryllium	0.004	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Cadmium	0.005	mg/L	ND J	ND J	ND	ND	ND J	ND J	ND	ND	NA	ND J	ND J			
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND J	NA	ND JB	ND			
Cobalt	0.006	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND JB	ND J			
Fluoride	4.0	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND	3.16	NA	ND J	ND J			
Lead	0.015	mg/L	ND J	ND	ND	ND	ND	ND	ND J	ND J	NA	ND	ND J			
Lithium	0.04	mg/L	0.669	0.516	0.648	0.677	0.689	0.746	0.767	0.762	NA	0.699	0.790			
Mercury	0.002	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Molybdenum	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Radium 226	5.0	pCi/L	1.38	0.386	0.472	1.15	1.15	0.923	1.53	1.03	NA	1.18	1.43			
Radium 228																
Selenium	0.05	mg/L	ND	ND	ND J	ND JB	ND	ND	ND	ND	NA	ND J	ND			
Thallium	0.002	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND J	NA	ND	ND			

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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.

F1 = MS and/or MSD Recovery is outside acceptance limits.

D1 = Sample required dilution due to high concentration of target analyte

D2 = Sample required dilution due to matrix interference

H1 = Sample analysis performed pasts holding time

H3 = Sample received and analyzed past holding time

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

M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. 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

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-3A**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																							
			9/28/2018		4/23/2019		10/1/2019		4/7/2020		9/22/2020		4/22/2021		9/23/2021		4/20/2022		12/10/2022		6/24/2023		11/8/2023			
			Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment		Assessment			
Boron	--	mg/L	0.257	JB	0.259	JB	ND	D2 U	0.26		0.28		0.25		0.37		0.28		<1.0	D2, U	0.30		0.31			
Calcium	--	mg/L	447	B	411		490	D1	425	D1	423	D1	438	D1	483	D1	428	D1	553	D1	531	D1	475	D1		
Chloride	--	mg/L	2040	B	1850		4570	D	3220	D	1200	D	3460	D	1780	D	1820	D	2530	D	1820	D	1190	D,J		
Fluoride	4.0	mg/L	ND	JB	0.387	J	0.4		0.5		0.4		0.4		<0.20	U	0.4		0.4		0.5		0.4			
pH (Field Measurement)	--	s.u.	7.98		7.23		7.33	H3	6.86		6.61		7.26		6.77		6.68		6.99		7.82		7.37			
Sulfate	--	mg/L	1130	B	1080		1680	D	1840	D	1830	D	2110	D	2380	D	752	D	1720	D	1140	D,M2	2530	D,J		
Total Dissolved Solids	--	mg/L	4940		4250	B	6900	H1	5860		5680		5940		6490		5220		5350		5090		3630	J		
<b>APPENDIX IV CONSTITUENTS</b>																										
Antimony	0.006	mg/L	NA		0.000102	JB	ND	V1 U	<0.005		<0.005		<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U
Arsenic	0.01	mg/L	ND	JB	0.000575	JB	ND	D2 U	<0.0010		<0.0010		<0.0010	U	<0.0010	U	<0.001	U	<0.001	U	<0.001	U	<0.001	U	<0.001	U
Barium	2.0	mg/L	ND	J	0.0474	J	0.051	D2 U	0.042		0.043		0.042		0.045		0.038		0.04		0.035		0.038		0.038	
Beryllium	0.004	mg/L	NA		0.000199	J	ND	D2 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U
Cadmium	0.005	mg/L	NA		0.000164	J	ND	V1 U	0.0001	J	<0.0010		0.0002	J	<0.0010	U	0.0001	J	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U
Chromium	0.1	mg/L	NA		0.00168	JB	ND	D2 U	<0.0020		0.0006	J	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U
Cobalt	0.006	mg/L	NA		0.000243	J	0.008		<0.004		0.004		<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U
Fluoride	4.0	mg/L	ND	JB	0.387	J	0.4		0.5		0.4		0.4		<0.20	U	0.4		0.4		0.5		0.4		0.4	
Lead	0.015	mg/L	NA		0.000137	J	ND	V1 U	<0.002		<0.002		<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U
Lithium	0.04	mg/L	0.766		0.678		0.79	D1	0.68		0.80	D2	0.75		0.76		0.65		0.61		0.64		0.71		0.71	
Mercury	0.002	mg/L	ND		ND		ND	V1 U	<0.0005		<0.0005		<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U
Molybdenum	0.1	mg/L	NA		ND		ND	D2 U	<0.01		<0.01		<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Radium 226	5.0	pCi/L	1.21		0.641		0.139		1.06		1.51		1.25		1.46		1.46	J	2.3	J	1.43	J	2.45	J		
0.734																										
Selenium	0.05	mg/L	NA		0.00103	J	ND	D2 U	<0.003		<0.003		<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U
Thallium	0.002	mg/L	NA		0.000860	J	ND	V1 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-4**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE													
			3/29/2016	5/23/2016	8/18/2016	10/26/2016	2/1/2017	5/2/2017	8/8/2017	9/7/2017	10/6/2017	6/5/2018	7/11/2018			
			Baseline Events											Assessment	Re-Sampling	
Boron	--	mg/L	0.602	0.498 J	1.58	1.7	1.54 B	2.09	2.51 B	2.87 B	1.36	NA	0.751 J			
Calcium	--	mg/L	660	386 B	464	558	591	774	743	739	828	NA	822			
Chloride	--	mg/L	1450 B	939 B	952 B	1000 B	1420 B	1320 B	1360 B	1880 B	1730 B	NA	1430 B			
Fluoride	4.0	mg/L	ND J	ND	ND J	ND JB	ND J	1.06 B	ND	ND JB	ND J	NA	ND J			
pH (Field Measurement)	--	s.u.	6.36	6.83	7.08	6.61	7.28	7.1	6.84	6.64	6.93	6.86	6.58			
Sulfate	--	mg/L	1830	1640	1420	1420 B	1620	1430 B	1600 B	2020	1590 B	NA	1460			
Total Dissolved Solids	--	mg/L	3700	4250	3440	3250	4420	4550	4890	4700 H	6220	NA	4880			
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.006	mg/L	ND	ND J	ND JB	ND	ND	ND JB	ND JB	ND JB	NA	ND JB	ND			
Arsenic	0.01	mg/L	ND	ND J	ND J	ND	ND J	ND J	ND J	ND JB	NA	ND JB	ND J			
Barium	2.0	mg/L	ND J	ND J	ND J	ND JB	ND J	ND J	ND J	ND JB	NA	ND J	ND J			
Beryllium	0.004	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Cadmium	0.005	mg/L	ND J	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND JB	ND			
Cobalt	0.006	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND JB	ND J			
Fluoride	4.0	mg/L	ND	ND	ND J	ND JB	ND J	ND B	ND	ND JB	NA	ND J	ND J			
Lead	0.015	mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND J			
Lithium	0.04	mg/L	1.39	0.838	1.13	1.25	1.35	1.59	1.77	1.66	NA	1.81	1.91			
Mercury	0.002	mg/L	0.00027	0.000224	ND J	0.000248	0.000302	0.000717	0.000825	0.000485	NA	0.000824	0.000832			
Molybdenum	0.1	mg/L	ND J	ND J	ND	ND	ND J	ND	ND	ND	NA	ND	ND			
Radium 226	5.0	pCi/L	1.26	0.592	ND	0.536	1.22	1.43	1.94	1.19	NA	1.62	2.00			
Radium 228																
Selenium	0.05	mg/L	ND J	ND J	ND J	ND	ND J	ND	ND	ND J	NA	ND J	ND			
Thallium	0.002	mg/L	ND	ND	ND	ND J	ND	ND	ND	ND	NA	ND	ND			

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-4**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																							
			9/28/2018		4/22/2019		10/1/2019		4/7/2020		9/22/2020		4/22/2021		9/23/2021		4/20/2022		12/10/2022		6/24/2023		11/7/2023			
			Assessment																							
Boron	--	mg/L	1.33	B	1.25	B	1.75	D2	0.83		1.70	D2	1.38	D1	1.43	D1	0.87		1.26	D2	1.20	D1	0.31			
Calcium	--	mg/L	722	B	730		690	D1	464	D1	823	D1	764	D1	841	D1	534	D1	871	D1	725	D1	702	D1		
Chloride	--	mg/L	1310	B	1510		1910	D	1560	D	2030	D	2470	D	1910	D	704	D	2270	D	1130	D	1090	D		
Fluoride	4.0	mg/L	ND	JB	0.102	J	0.2		0.2		0.2		0.2		<0.20	U	0.2		0.2		0.2		0.2			
pH (Field Measurement)	--	s.u.	8.06		7.26		7.36	H3	6.70		6.64		7.12		6.52		6.68		7.05		7.69		7.16			
Sulfate	--	mg/L	1400	B	1440		2490	D	4000	D	2080	D	2330	D	1780	D	1230	D	2500	D	1650	D	1890			
Total Dissolved Solids	--	mg/L	5170		4840	B	4820	H1	5120		4470		5040		5610		5740		3850		4660	J	4080			
<b>APPENDIX IV CONSTITUENTS</b>																										
Antimony	0.006	mg/L	NA		0.000360	JB	ND	V1 U	<0.005		<0.005		<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U		
Arsenic	0.01	mg/L	ND	JB	0.000445	JB	ND	D2 U	<0.0010		<0.0010		<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U		
Barium	2.0	mg/L	ND	J	0.0308	JB	0.029	D2 J	0.022		0.031		0.029		0.030		0.022		0.025		0.023		0.02			
Beryllium	0.004	mg/L	NA		ND		ND	D2 U	<0.0020		<0.0040	D2	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U		
Cadmium	0.005	mg/L	NA		ND		ND	V1 U	<0.0010		<0.0010		<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U		
Chromium	0.1	mg/L	NA		0.00110	JB	ND	D2 U	0.0008	J	<0.0020		<0.0020	U	<0.0020	U	0.0008	J	0.0006	J	0.0018	J	0.0008	J		
Cobalt	0.006	mg/L	NA		0.000415	J	ND	U	<0.004		<0.004		<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U		
Fluoride	4.0	mg/L	ND	JB	0.102	J	0.2		0.2		0.2		0.2		<0.20	U	0.2		0.2		0.2		0.2			
Lead	0.015	mg/L	NA		ND		ND	V1 U	<0.002		<0.002		<0.0020	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U		
Lithium	0.04	mg/L	1.81		1.73		ND	D2 V1 U	0.82		1.73	D2	1.44		1.44	D2	0.79		1.1	D1	1.20	D1	0.99	D1		
Mercury	0.002	mg/L	0.000680		0.000825		0.0004	V1 J	0.0003	J	0.0003	J	0.0004	J	0.0002	J	0.0002	J	0.0007		0.0004	J	0.0004	J		
Molybdenum	0.1	mg/L	NA		ND		ND	D2 U	0.002	J	<0.01		<0.01	U	<0.01	U	0.002	J	<0.01	U	<0.01	U	<0.01	U		
Radium 226	5.0	pCi/L	1.51		1.66		0.451		1.26		0.877		0.982		0.551		2.55	J	1.6	J	2.09	J	1.32	J		
Radium 228							0.804																			
Selenium	0.05	mg/L	NA		0.00211	J	ND	U	0.023		<0.003		0.003		<0.003	U	0.028		0.002	J	0.003		0.001	J		
Thallium	0.002	mg/L	NA		0.000410	J	ND	V1 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U		

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-5**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE												Assessment	Re-Sampling
			3/29/2016	5/23/2016	8/18/2016	10/26/2016	2/1/2017	5/2/2017	8/7/2017	9/7/2017	10/6/2017	6/5/2018	7/11/2018			
			Baseline Events													
Boron	--	mg/L	0.217	0.0896 J	0.216 J	0.214 J	0.222 JB	0.241 J	0.257 JB	0.276 B	0.262	NA	0.207 J			
Calcium	--	mg/L	452	189 B	374	399	335	464	423	407 B	383	NA	469			
Chloride	--	mg/L	1630 B	521	688 B	755 B	734 B	722 B	945 B	779 B	608 B	NA	941 B			
Fluoride	4.0	mg/L	ND J	ND	ND J	ND	ND J	ND JB	ND	3.69	ND J	NA	ND J			
pH (Field Measurement)	--	s.u.	6.76	6.74	6.99	6.61	7.14	7.44	6.87	7.13	7.06	6.88	6.40			
Sulfate	--	mg/L	1760 HB	876	1780	1740 B	1880	1760 B	2060 B	1920	1600 B	NA	1800			
Total Dissolved Solids	--	mg/L	4210	1660	3470	3610	3680	4250	4130	4120	4390	NA	4100			
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.006	mg/L	ND	ND J	ND JB	ND	ND	ND JB	ND JB	ND JB	NA	ND JB	ND			
Arsenic	0.01	mg/L	ND	ND J	ND JB	ND J	ND J	ND J	ND J	ND JB	NA	ND JB	ND J			
Barium	2.0	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND J	ND J			
Beryllium	0.004	mg/L	ND	ND	ND J	ND	ND	ND	ND	ND	NA	ND	ND			
Cadmium	0.005	mg/L	ND J	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND J	ND J	ND	ND J	NA	0.00363 B	ND			
Cobalt	0.006	mg/L	ND	ND J	ND J	ND J	ND	ND J	ND	ND J	NA	ND JB	ND J			
Fluoride	4.0	mg/L	ND J	ND	ND J	ND	ND J	ND	ND	3.69	NA	ND J	ND J			
Lead	0.015	mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND	NA	ND J	ND J			
Lithium	0.04	mg/L	0.521	0.136	0.305	0.325	0.368	0.415	0.405	0.353	NA	0.459	0.481			
Mercury	0.002	mg/L	ND	ND	ND	ND	ND	ND	0.00351	ND	NA	ND	ND			
Molybdenum	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Radium 226	5.0	pCi/L	1.16	0.736	0.959	0.957	0.765	0.888	1.54	0.773	NA	0.862	1.42			
Radium 228																
Selenium	0.05	mg/L	ND	ND	ND	ND	ND J	ND J	ND	ND	NA	ND J	ND			
Thallium	0.002	mg/L	ND	ND	ND J	ND J	ND	ND J	ND	ND J	NA	ND J	ND			

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-5**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE											
			9/28/2018	4/22/2019	9/30/2019	4/7/2020	9/22/2020	4/22/2021	9/23/2021	4/20/2022	12/9/2022	6/24/2023	11/7/2023	
			Assessment											
Boron	--	mg/L	0.263 JB	0.271 JB	ND D2 U	0.25	0.24	0.24	0.24	0.23	0.26	<1.0 D2, V1, U	0.24	0.21
Calcium	--	mg/L	441 B	446	476 D1	464 D1	495 D1	498 D1	453 D1	500 D1	561 D1	485 D1	439 D1	
Chloride	--	mg/L	1140 B	931	1500 D	1860 D	1800 D	2080 D	2250 D	850 D	1930 D	1020 D	992 D	
Fluoride	4.0	mg/L	ND JB	0.128 J	0.2	0.2	0.2	0.2	<0.2 U	<0.2 U	0.2	0.3	0.2	
pH (Field Measurement)	--	s.u.	7.99	7.15	7.41 H3	6.77	6.52	6.92	6.67	6.59	6.94	7.71	7.25	
Sulfate	--	mg/L	1890 B	1800	2990 D	3720 D	973 D	3440 D	1000 D	877 D	3080 D	1900 D	2390 D	
Total Dissolved Solids	--	mg/L	4540	4360 B	5320 H1	4960	5170	5000	5630	4900	4630 H2,J-	4220 H2,J	4650	
<b>APPENDIX IV CONSTITUENTS</b>														
Antimony	0.006	mg/L	NA	0.0000700 JB	ND V1 U	<0.005	<0.005	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	
Arsenic	0.01	mg/L	ND JB	0.000424 JB	ND D2 U	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.001 U	<0.0010 U	<0.0010 U	<0.0010 U	
Barium	2.0	mg/L	ND J	0.0167 J	0.016 D2 J	0.014	0.014	0.014	0.013	0.013	0.012	0.012	0.011	
Beryllium	0.004	mg/L	NA	ND	ND D2 U	<0.0020	<0.0040 D2	<0.0020 U	<0.0020 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	
Cadmium	0.005	mg/L	NA	ND	ND V1 U	<0.0010	<0.0010	0.0006 J	<0.0010 U	<0.001 U	<0.001 U	<0.001 U	<0.001 U	
Chromium	0.1	mg/L	NA	0.00159 JB	0.0033	<0.0020	0.0008 J	<0.0020 U	<0.0020 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	
Cobalt	0.006	mg/L	NA	0.000288 J	ND U	<0.004	<0.004	<0.004 U	<0.004 U	<0.004 U	<0.004 U	<0.004 U	<0.004 U	
Fluoride	4.0	mg/L	ND JB	0.128 J	0.2	0.2	0.2	0.2	<0.2 U	<0.2 U	0.2	0.3	0.2	
Lead	0.015	mg/L	NA	0.0000860 J	ND V1 U	<0.002	<0.002	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	<0.002 U	
Lithium	0.04	mg/L	0.425	0.434	0.40 D1	0.38	0.42 D2	0.39	0.35	0.39	0.33	0.33	0.36	
Mercury	0.002	mg/L	ND	ND	ND V1 U	<0.0005	<0.0005	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	<0.0005 U	0.0002 J	
Molybdenum	0.1	mg/L	NA	ND	ND D2 U	<0.01	<0.01	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	<0.01 U	
Radium 226	5.0	pCi/L	1.37	0.945	0.368	1.48	1.68	1.24	1.02	2.67 J	1.37 J	1.69 J	1.12 J	
Radium 228					0.730									
Selenium	0.05	mg/L	NA	0.000624 J	ND U	<0.003	<0.003	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	<0.003 U	
Thallium	0.002	mg/L	NA	0.0000890 J	ND V1 U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.002 U	<0.002 U	0.0001 J	<0.002 U	

GWPS = Groundwater Protection Standard

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NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

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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- = Qualifid as estimated biased low during data review.

B = Compound was found in the blank and sample.

F1 = MS and/or MSD Recovery is outside acceptance limits.

D1 = Sample required dilution due to high concentration of target analyte

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H1 = Sample analysis performed pasts holding time

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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

M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. 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

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY**  
MW-6

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE												6/4/2018	7/10/2018
			3/29/2016	5/23/2016	8/18/2016	10/26/2016	2/1/2017	5/2/2017	8/7/2017	9/5/2017	10/5/2017	Assessment		Re-Sampling		
			Baseline Events													
Boron	--	mg/L	0.156	0.137 J	0.193 J	0.168 J	0.173 B	0.179 J	0.167 JB	0.199 J	0.178	NA	0.155 J			
Calcium	--	mg/L	467	374 B	373	400	320	415	365	382 B	376	NA	386			
Chloride	--	mg/L	167 B	149 B	136 JB	150 B	125 B	129 B	128 B	123 B	138 B	NA	147 B			
Fluoride	4.0	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND	ND J	ND J	NA	ND J			
pH (Field Measurement)	--	s.u.	6.66	6.65	6.96	6.6	6.92	6.97	6.76	6.95	6.86	NA	6.50			
Sulfate	--	mg/L	2250 HB	3340	2550	2610 B	2700	2600 B	2820 B	2490	2700 B	NA	2120			
Total Dissolved Solids	--	mg/L	4060	4280	4350	4470	4720	4700	4830	4890	4910	NA	4500			
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.006	mg/L	ND	ND J	ND JB	ND	ND	ND JB	ND JB	ND JB	NA	ND JB	ND			
Arsenic	0.01	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	NA	ND JB	ND J			
Barium	2.0	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND J	ND J			
Beryllium	0.004	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Cadmium	0.005	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Chromium	0.1	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND J	NA	ND JB	ND			
Cobalt	0.006	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND JB	ND J			
Fluoride	4.0	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND	ND J	NA	ND J	ND J			
Lead	0.015	mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND J			
Lithium	0.04	mg/L	0.0475 J	0.0527	0.0555	0.0524	0.0607	0.0724	0.0589	0.0554	NA	0.0650	0.0592			
Mercury	0.002	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND			
Molybdenum	0.1	mg/L	ND J	ND J	ND J	ND B	ND J	ND J	ND J	ND J	NA	ND J	ND J			
Radium 226	5.0	pCi/L	0.741	0.386	ND	0.751	ND	ND	0.462	ND	NA	0.392	0.532			
Radium 228																
Selenium	0.05	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND J	ND			
Thallium	0.002	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND			

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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



**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-6**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																					
			9/28/2018		4/22/2019		9/30/2019		4/6/2020		9/22/2020		4/22/2021		9/23/2021		4/20/2022		12/9/2022		6/24/2023		11/8/2023	
			Assessment																					
Boron	--	mg/L	0.196	JB	0.194	JB	ND	D2 U	0.19		0.19		0.18		0.18		0.2		<1.0	D2, V1, U	0.19		0.15	M2
Calcium	--	mg/L	356	B	421		431	D1	458	D1	417	D1	376	D1	417	D1	451	D1	474	D1	408	D1	375	D1, M3
Chloride	--	mg/L	142	B	142		230	D	181	D	286	D	276	D	130	D, M2	148	D	204	D	144	D	192	D, M3
Fluoride	4.0	mg/L	ND	JB	0.409	J	0.5		0.4		0.5		0.4		<0.20	M2, U	0.3		0.5		0.5		0.5	J-
pH (Field Measurement)	--	s.u.	7.94		6.86		7.15	H3	6.36		6.32		6.72		6.87		6.75		6.88		7.64		7.42	
Sulfate	--	mg/L	2420		2200		3830	D	4650	D	2380	D, H2	3460	D	1620	D, M2	1570	D	3030	D, J	2360	D	8480	D, M3
Total Dissolved Solids	--	mg/L	4820		4780	B	4830	H1	4610		4740		5050		5080		4860		4560	H2, J-	4760	H2,J	4030	
<b>APPENDIX IV CONSTITUENTS</b>																								
Antimony	0.006	mg/L	NA		0.0000920	JB	ND	V1 U	<0.005		<0.005		<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U
Arsenic	0.01	mg/L	ND	JB	0.000722	JB	ND	V1 U	<0.0010		<0.0010		<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U
Barium	2.0	mg/L	ND	J	0.0128	J	0.010	D2 J	0.011		0.011		0.014		0.009		0.011		0.01		0.011		0.009	
Beryllium	0.004	mg/L	NA		ND		ND	D2 U	<0.0020		<0.0020	V1	<0.0020	U	<0.0020	U	<0.0020	V1, U	<0.0020	U	<0.0020	U	<0.0020	U
Cadmium	0.005	mg/L	NA		ND		ND	V1 U	0.0001	J	<0.0010		<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U	<0.0010	U
Chromium	0.1	mg/L	NA		0.00196	JB	ND	U	<0.0020		0.0006	J	0.0006	J	0.0006	J	<0.0020	U	<0.0020	U	0.0008	J	<0.0020	U
Cobalt	0.006	mg/L	NA		0.000276	J	ND	U	<0.004		<0.004		<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U	<0.004	U
Fluoride	4.0	mg/L	ND	JB	0.409	J	0.5		0.4		0.5		0.4		<0.20	M2, U	0.3		0.5		0.5		0.5	J-
Lead	0.015	mg/L	NA		ND		ND	V1 U	<0.002		<0.002		<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.0005	U
Lithium	0.04	mg/L	0.0558		0.0633		0.05	D2 V1 J	0.05		0.05	D2, J	0.05		0.04		0.05		0.04		0.04		0.04	
Mercury	0.002	mg/L	ND		ND		ND	V1 U	<0.0005		<0.0005		<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U
Molybdenum	0.1	mg/L	NA		0.000972	J	ND	D2 U	<0.01		<0.01		<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U	0.002	J
Radium 226	5.0	pCi/L	ND	U	0.450		0.548		0.744		0.380		0.674		0.109		0.404	J	1.29	J	1.40	J	0.220	J
Radium 228							0.698																	
Selenium	0.05	mg/L	NA		0.00110	J	ND	U	<0.003		<0.003		<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U
Thallium	0.002	mg/L	NA		0.0000610	J	ND	V1 U	<0.0020		<0.0020		<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U

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U = Target analyte was analyzed for, but was below detection limit  
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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY**  
**MW-104**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE																					
			3/29/2019		4/10/2019		10/25/2019		4/17/2020		10/1/2020		5/26/2021		9/23/2021		4/22/2022		12/10/2022		6/24/2023		11/7/2023	
Characterization																								
Boron	--	mg/L	0.1880	JB	0.2710	JB	ND	D2, U	0.21		0.23	D2	0.26	M4	0.25		0.25		0.26	D1	0.26		0.24	
Calcium	--	mg/L	465	B	502		505	D1	527	D1	491	D1	459	D1,M1,M2	466	D1	486	D	536	D1	477	D1	496	D1
Chloride	--	mg/L	1430		1430	B	1610	D	2630	D	2220	D	1650	D	1430	M2	3080	D	3450	D, M2	3000	D	2490	D, M3
Fluoride	4.0	mg/L	ND		0.3230	JB	0.4		0.3		0.3		0.4		0.4	M2, Y2	0.4		0.4	M2,J	<0.2	U	0.3	J-
pH (Field Measurement)	--	s.u.	6.88		6.99		6.86		6.58		6.91		7.55		6.22		5.98		6.91		7.77		7.33	
Sulfate	--	mg/L	2870		2880	B	2440	D	4710	D	2730	D	1970	D	1900	D, M1	1100	D	4480	D, M2	4010		4190	D, M3
Total Dissolved Solids	--	mg/L	6990		6690		7330		6320		6270		7330		7230		6500		5810		7990		5770	
APPENDIX IV CONSTITUENTS																								
Antimony	0.006	mg/L	0.0001	JB	0.0001	JB	ND	U	<0.005		<0.005		<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U	<0.005	U
Arsenic	0.01	mg/L	0.0022	J	0.0021	J	0.0039		0.0013		0.0013		0.0008	J	0.0010		0.0015		0.001		0.0011		0.0010	
Barium	2.0	mg/L	0.0243	J	0.0216	JB	0.030		0.018		0.018		0.016		0.017		0.017		0.016		0.016		0.016	
Beryllium	0.004	mg/L	ND		ND		ND	U	<0.0020		<0.0020	D2	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U
Cadmium	0.005	mg/L	ND		ND		0.0004	J	<0.0010		<0.0010		0.0001	J	0.0006	J	0.0004	J	0.0015		0.0003	J	0.0004	J
Chromium	0.1	mg/L	0.0047	B	0.0036		0.0066		0.0020		0.0013	J	0.0012	J	<0.0020	U	0.001	J	0.0007	J	<0.0020	U	0.0006	J
Cobalt	0.006	mg/L	0.0059	B	0.0052		0.011		0.005		0.005		<0.004	U	<0.004	U	0.005		0.004		0.004		0.004	
Fluoride	4.0	mg/L	ND		0.3230	JB	0.4		0.3		0.3		0.4		0.4	M2, Y2	0.4		0.4	M2,J	<0.2	U	0.3	J-
Lead	0.015	mg/L	0.0011	J	0.0002	J	0.003		<0.002		<0.002		<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U	<0.002	U
Lithium	0.04	mg/L	0.0281	J	0.0286	J	0.02		0.02		0.02	D2	0.02	M1	0.03		0.03		0.03		0.04		0.05	
Mercury	0.002	mg/L	ND		ND	^	ND	U	<0.0005		<0.0005		<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U	<0.0005	U
Molybdenum	0.1	mg/L	0.0015	J	0.0010	J	0.005	J	0.003	J	<0.01	D2	0.002	J	<0.01	U	<0.01	U	<0.01	U	<0.01	U	<0.01	U
Radium 226	5.0	pCi/L	0.7760		0.3190	U	0.126		0.655		0.422		0.385		1.36		0.71	J	1.29		0.797	J	0.710	J
Radium 228							1.52																	
Selenium	0.05	mg/L	ND		ND		ND	U	<0.003		<0.003	D2	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U	<0.003	U
Thallium	0.002	mg/L	ND		ND		ND	U	<0.0020		<0.0020		0.0001	J	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U	<0.0020	U

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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

**GREEN LANDFILL - CCR ANALYTICAL SUMMARY**  
**MW-105**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE															
			6/24/2023	4/10/2019														
<b>Characterization</b>																		
Boron	--	mg/L	NA	NA														
Calcium	--	mg/L	NA	NA														
Chloride	--	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
pH (Field Measurement)	--	s.u.	6.56	6.22														
Sulfate	--	mg/L	NA	NA														
Total Dissolved Solids	--	mg/L	NA	NA														
<b>APPENDIX IV CONSTITUENTS</b>																		
Antimony	0.006	mg/L	NA	NA														
Arsenic	0.01	mg/L	0.0153	0.0103														
Barium	2.0	mg/L	NA	NA														
Beryllium	0.004	mg/L	NA	NA														
Cadmium	0.005	mg/L	NA	NA														
Chromium	0.1	mg/L	NA	NA														
Cobalt	0.006	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
Lead	0.015	mg/L	NA	NA														
Lithium	0.04	mg/L	NA	NA														
Mercury	0.002	mg/L	NA	NA														
Molybdenum	0.1	mg/L	NA	NA														
Radium 226	5.0	pCi/L	NA	NA														
Radium 228																		
Selenium	0.05	mg/L	NA	NA														
Thallium	0.002	mg/L	NA	NA														

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**GREEN LANDFILL - CCR ANALYTICAL SUMMARY**  
**MW-106S**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE															
			6/24/2023	4/10/2019														
			Characterization															
Boron	--	mg/L	NA	NA														
Calcium	--	mg/L	NA	NA														
Chloride	--	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
pH (Field Measurement)	--	s.u.	6.77	6.69														
Sulfate	--	mg/L	NA	NA														
Total Dissolved Solids	--	mg/L	NA	NA														
<b>APPENDIX IV CONSTITUENTS</b>																		
Antimony	0.006	mg/L	NA	NA														
Arsenic	0.01	mg/L	0.0607	0.0832														
Barium	2.0	mg/L	NA	NA														
Beryllium	0.004	mg/L	NA	NA														
Cadmium	0.005	mg/L	NA	NA														
Chromium	0.1	mg/L	NA	NA														
Cobalt	0.006	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
Lead	0.015	mg/L	NA	NA														
Lithium	0.04	mg/L	NA	NA														
Mercury	0.002	mg/L	NA	NA														
Molybdenum	0.1	mg/L	NA	NA														
Radium 226	5.0	pCi/L	NA	NA														
Radium 228																		
Selenium	0.05	mg/L	NA	NA														
Thallium	0.002	mg/L	NA	NA														

GWPS = Groundwater Protection Standard  
 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.  
 mg/L = milligrams per liter  
 NA = Not Analyzed  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picocuries per Liter  
 s.u. = standard units  
 U = Target analyte was analyzed for, but was below detection limit



**GREEN LANDFILL - CCR ANALYTICAL SUMMARY  
MW-106D**

APPENDIX III CONSTITUENTS	2023 GWPS	Units	DATE															
			6/24/2023	4/10/2019														
			Characterization															
Boron	--	mg/L	NA	NA														
Calcium	--	mg/L	NA	NA														
Chloride	--	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
pH (Field Measurement)	--	s.u.	7.26	7.07														
Sulfate	--	mg/L	NA	NA														
Total Dissolved Solids	--	mg/L	NA	NA														
<b>APPENDIX IV CONSTITUENTS</b>																		
Antimony	0.006	mg/L	NA	NA														
Arsenic	0.01	mg/L	< 0.10 U	0.0012														
Barium	2.0	mg/L	NA	NA														
Beryllium	0.004	mg/L	NA	NA														
Cadmium	0.005	mg/L	NA	NA														
Chromium	0.1	mg/L	NA	NA														
Cobalt	0.006	mg/L	NA	NA														
Fluoride	4.0	mg/L	NA	NA														
Lead	0.015	mg/L	NA	NA														
Lithium	0.04	mg/L	NA	NA														
Mercury	0.002	mg/L	NA	NA														
Molybdenum	0.1	mg/L	NA	NA														
Radium 226	5.0	pCi/L	NA	NA														
Radium 228																		
Selenium	0.05	mg/L	NA	NA														
Thallium	0.002	mg/L	NA	NA														

GWPS = Groundwater Protection Standard  
 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.  
 mg/L = milligrams per liter  
 NA = Not Analyzed  
 ND = Not Detected at or above Method Detection Limit  
 pCi/L = picocuries per Liter  
 s.u. = standard units  
 U = Target analyte was analyzed for, but was below detection limit

## MW-2 Arsenic Characterization Study - Groundwater Laboratory Results

BREC Sebree Green CCR Landfill

Robards, KY

		2023 GWPS	Sample Location: Depth: Date: Lab ID:	MW-105 20.8' - 30.8' 6/24/2023 50348165003	MW-106S 28.8' - 38.8' 6/24/2023 50348165005	MW-106D 53.3' - 63.3' 6/24/2023 50348165007	DUP 53.3' - 63.3' 6/24/2023 50348165009	MW-2 37.8'-47.8' 6/24/2023 50348165003
				Characterization Well				Compliance Well
Analytical Method	Analyte		Unit			Field Duplicate Pair		
<b>Laboratory Groundwater Results</b>								
EPA 6010	Arsenic (total)	0.01	mg/L	0.0153	0.0607	<0.01 U	<0.01 U	0.0323
EPA 6020	Arsenic (dissolved; 0.45 µm)	0.01	mg/L	0.0140	0.0556	0.0011	0.0012	0.0065
EPA 6020	Arsenic (dissolved; 0.20 µm)	0.01	mg/L	0.0138	0.0592	0.0011	0.0013	0.0058
IC-ICP-CR-MS	Arsenic (III)	0.01	mg/L	0.00730	0.0601	0.00103 J	0.00104 J	0.00516
IC-ICP-CR-MS	Arsenic (V)	0.01	mg/L	0.00695	0.0125	<0.0005 U	<0.0005 U	0.00116
EPA 6010	Iron (total)	NA	mg/L	38.2	9.18	0.444	0.446	2.580
SM 3500-Fe	Ferric Iron (dissolved)	NA	mg/L	34.9	na	<0.20 U	<0.20 U	1.2
<b>Field Water Quality Parameters</b>								
Field	pH	NA	s.u.	6.56	6.77	7.26	7.26	6.33
Field	Specific Conductivity	NA	mS/cm	2.33	1.49	0.615	0.615	1.91
Field	ORP	NA	mV	-109.0	-101.0	-106.0	-106.0	-94.0
Field	DO	NA	mg/L	0.0	0.0	0.0	0.0	0.0
Field	Ferrous Iron	NA	mg/L	3.27	ORR	0.44	0.41	1.33
Field	Turbidity	NA	NTU	58.4	3.90	16.70	16.70	18.9
Field	Temperature	NA	°C	19.45	16.00	19.04	19.04	16.34

**Notes:**

Orange Shading - groundwater concentration exceeds the GWPS.

µm - micrometers

°C = degree Celsius

As = arsenic

DO = dissolved oxygen

EPA = Environmental Protection Agency

IC-ICP-CR-MS = Ion Chromatography-Inductively Coupled Plasma Mass Spectrometry

J = Estimated result (by the laboratory or during the data evaluation)

mg/L = milligram per liter

mS/cm = millisiemens per centimeter

mV = millivolts

NA = not applicable

na = not available

NTU = Nephelometric turbidity units

ORP = oxidation reduction potential

ORR = over range of instrument detection/sensitivity

s.u. = standard unit

U = Target analyte was analyzed for, but was below detection limit

**MW-2 Arsenic Characterization Study - Soil Laboratory Results**  
 BREC Sebree Green CCR Landfill  
 Robards, KY

			2023 GWPS	Sample Location: Depth: Date:	MW-105 15'-17' 4/25/2023	MW-105 23'-25' 4/25/2023	MW-105 28'-30' 4/25/2023	MW-105 31'-32' 4/25/2023	MW-106S 22'-24' 4/26/2023	DUP-1 22'-24' 4/26/2023	MW-106S 37'-39' 4/26/2023	MW-106D 51'-53' 4/27/2023	MW-106D 58'-60' 4/27/2023
Characterization Well													
Analytical Method	Analyte		Unit	Field Duplicate Pair									
<b>Soil Results</b>													
EPA 6020	Arsenic		mg/kg	6.3	6.2	3.0	26.2	2.4	3.6	3.6	6.6	1.5	
EPA 6010	Iron		mg/kg	20,500	23,600	24,700	56,400	17,800	25,000	45,900	21,600		
Laboratory	Moisture		%	19.5	22.0	17.6	10.7	19.6	20.2	17.0	4.8		
<b>Synthetic Precipitation Leaching Procedure (SPLP)</b>													
EPA 6010	Arsenic		0.01 mg/L	<0.010 U	0.056	0.012	0.024	0.046	0.058	0.036	<0.010 U	<0.010 U	
EPA 6010	Iron		mg/L	3.6	141	35.8	39.7	152	189	74.2	<0.10 U	6.3	
<b>Field X-Ray Fluorescence (XRF) Soil Results (7/20/2023)</b>													
Field	Arsenic		mg/kg	ND 8 +/- 3	ND 10 +/- 3	ND ND	8 +/- 2 ND	ND ND	ND 8 +/- 2	ND ND	13 +/- 4 14 +/- 4	ND ND	
Field	Iron		mg/kg	19,970 +/- 254 22,378 +/- 275	22,203 +/- 253 24,146 +/- 266	14,539 +/- 215 15,114 +/- 225	17,988 +/- 215 21,622 +/- 266	14,255 +/- 172 21,832 +/- 263	18,084 +/- 207 17,767 +/- 211	22,965 +/- 257 18,390 +/- 276	43,079 +/- 651 53,023 +/- 714	17,974 +/- 304 24,624 +/- 304	
<b>X-Ray Diffraction (XRD) Laboratory Soil Results</b>													
Laboratory	Quartz	SiO2	%	43.0	45.0	47.0	19.0	50.0	--	60.0	19.0	42.0	
Laboratory	Plagioclase Feldspar	(Na,Ca)AlSi3O8	%	8	6	11	11	6	--	14	10	20	
Laboratory	K-Feldspar	KAlSi3O8	%	4	4	4	5	4	--	4	3	7	
Laboratory	Calcite	CaCO3	%	2	0	0	0	0	--	0	0	1	
Laboratory	Halite	NaCl	%	0	0	0	0	0	--	0	5	2	
Laboratory	Dolomite	(Ca,Mg)(CO3)2	%	4	0	2	0	0	--	0	0	0	
Laboratory	Siderite	FeCO3	%	1	0	0	1	0	--	0	3	2	
Laboratory	Goethite	alpha-FeOOH	%	0	0	0	9	0	--	0	0	0	
Laboratory	Kaolinite	Al2Si2O5(OH)4	%	3	2	2	19	3	--	5	13	13	
Laboratory	Chlorite	(Mg,Al)6(Si,Al)4O10(OH)8	%	1	1	1	1	1	--	2	12	2	
Laboratory	Illite / Mica	KAl2(Si3AlO10)(OH)2	%	27	17	24	21	10	--	13	30	9	
Laboratory	Mixed-Layered Illite/Smectite	K0.5Al2(Si,Al)4O10(OH)2 2H2O	%	8	25	10	15	26	--	3	5	3	
	Total		%	100	100	100	100	100	--	100	100	100	
	% Illite in ML I/S		%	75	70	70	80	50	--	75	85	70	
Soil	Description	CLAY, w/ silt, some very fine Sand Clay, some silt, trace very fine Sand Clay, some silt, trace very fine Sand Weathered Sandstone (very fine-fine grain), some iron staining. Clay, trace silt, iron oxide staining. Clay, trace-some silt; trace fine sand. Grades to graveling bottom Shale Sandstone, fine-grain, micaceous, organic streaks											
	Color	Dark Yellowish Brown (10YR 3/4) Very Dark Grey (2.5Y 3/1) Grayish Brown (10YR 5/2) Light Tan Brown (10YR 5/3) Dark Grey (10YR 4/1) Dark Grey Grey											
	Location	Sample Above MW Screen Sample Within MW Screen Sample Within MW Screen Sample Below MW Screen Sample Above MW Screen Sample Within MW Screen Sample Above MW Screen Sample Within MW Screen											

**Notes:**  
 Field XRF results include two field analysis results using a portable XRF instrument. Each field test represents an average of three XRF readings  
 Orange highlight - SPLP concentration exceeds the GWPS  
 EPA = Environmental Protection Agency  
 GWPS - Groundwater Protection Standard  
 % - percent  
 mg/kg - milligrams per kilogram  
 mg/L - milligrams per liter  
 MW - Monitoring Well  
 ND - not detected  
 U = Target analyte was analyzed for, but was below detection limit

**APPENDIX E - GREEN SURFACE IMPOUNDMENT  
ANALYTICAL SUMMARY TABLES**

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**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-11**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE											
			4/1/2016	6/2/2016	8/16/2016	10/25/2016	1/26/2017	5/1/2017	8/11/2017	9/20/2017	10/9/2017	5/7/2018		
			Baseline Events									Detection Events		
Boron	0.9744	mg/L	0.818 JB	0.645 J	0.736 JB^	0.736 J	0.920 JB	0.754 JB	0.695 JB	0.802 J	0.769 J	0.879		
Calcium	415	mg/L	371	378 B	243	291	276	326 B	321	299	315 B	317		
Chloride	3,967	mg/L	1070 B	1740 B	1880 B	2000 B	1880 B	1910 B	2360 B	1520 B	1940 B	1860 B		
Fluoride	0.891	mg/L	ND J	ND J	ND JB^	ND	ND JB	ND JB	ND	ND JB	ND J F1	ND J		
pH (Field Measurement)	6.367 - 7.552	s.u.	7.23	7.24	7.29	7.22	7.20	7.04	6.89	6.88	6.86	7.18		
Sulfate	2,023	mg/L	1170	1400	1150	1150 B	1060	1010 B	1410	797 J	1050 B	1020 B		
Total Dissolved Solids	5,418	mg/L	3920 H	4610	4840	4490	4930	4830	5100	4880	5080	5070		
<b>APPENDIX IV CONSTITUENTS</b>														
Antimony	--	mg/L	ND	ND JB	ND JB	ND	ND JB	ND JB	ND JB	ND JB	NA	NA		
Arsenic	--	mg/L	ND J	ND	ND	ND J	ND J	ND JB	ND J	ND JB	NA	NA		
Barium	--	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	NA		
Beryllium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Cadmium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Chromium	--	mg/L	ND	ND J	ND	ND	ND	ND	ND	ND J	NA	NA		
Cobalt	--	mg/L	0.00494 J	0.00267 J	0.00277 J	0.00138 J	0.00131 J	0.00129 J	0.000654 J	0.000619 J	NA	NA		
Fluoride	--	mg/L	ND J	ND J	ND J	ND	ND J	ND J	ND	ND JB	NA	NA		
Lead	--	mg/L	ND	ND JB	ND	ND	ND	ND	ND J	ND	NA	NA		
Lithium	--	mg/L	0.0365 J	0.0685	0.0651	0.0544	0.0591	0.0545	0.0615	0.0596	NA	NA		
Mercury	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Molybdenum	--	mg/L	0.0163	ND J	ND J	ND J	ND J	ND J	ND J	ND	NA	NA		
Radium 226	--	pCi/L	1.35	0.975	1.61	1.86	1.66	2.18	2.69	2.08	NA	NA		
Radium 228														
Selenium	--	mg/L	ND	ND J	ND J	ND	ND J	ND JB	ND	ND J	NA	NA		
Thallium	--	mg/L	ND J	ND	ND	ND	ND	ND J	ND J	ND	NA	NA		

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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.

H = Sample was prepped or analyzed beyond the specified holding time

^ = ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,DLCK or MRL standard; Instrument related QC is outside acceptance limits

F1 = MS and/or MSD Recovery is outside acceptance limits

D1 = Sample required dilution due to high concentration of target analysis

D2 = Sample required dilution due to matrix interference

D = Results reported from dilution

M1 = Matrix spike recovery was high; the method control sample recovery was accept

M2 = Matrix spike recovery was low; the method control sample recovery was accept

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.

M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

U = Target analyte was analyzed for, but was below detection limit

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-11**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE													
			9/27/2018	4/29/2019	10/3/2019	4/8/2020	9/25/2020	4/23/2021	9/24/2021	4/21/2022	10/1/2022					
			Detection Events													
Boron	0.9744	mg/L	0.671 B	0.717	ND	D2, M2, M4, U	0.78 M2, M4	<1.00 D2, M2	0.78 M4	<1.0 D2, U	0.84 M1	0.71 M2				
Calcium	415	mg/L	312	345	318	D1, M1	316 D1, M2	335 D2, M3	343 D1, M2	347 D1, M1, M2	315 D1, M3	339 D1, M3				
Chloride	3,967	mg/L	2000 B	1900	3900	D	2270 D	2620 D	3190 D	2040 D	2900 D	2900 D				
Fluoride	0.891	mg/L	ND J	0.227 J	0.2		0.2	0.2	0.2	0.2	0.2	0.2				
pH (Field Measurement)	6.367 - 7.552	s.u.	6.70	7.11	6.86		6.78	6.98	7.11	6.57	6.85	7.13				
Sulfate	2,023	mg/L	1080 B	949 B	971		1210 D	1280 D	1600 D	1980 D	1710 D	1450 D				
Total Dissolved Solids	5,418	mg/L	5020	4890 B	682		4650	4510	5130	5030	4760	4850				
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Arsenic	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Barium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Beryllium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Cadmium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Chromium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Cobalt	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Fluoride	--	mg/L	NA	0.227 J	0.2		0.2	0.2	0.2	0.2	0.2	0.2				
Lead	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Lithium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Mercury	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Molybdenum	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Radium 226	--	pCi/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Radium 228																
Selenium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				
Thallium	--	mg/L	NA	NA	NA		NA	NA	NA	NA	NA	NA				

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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.

H = Sample was prepped or analyzed beyond the specified holding time

^ = ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,DLCK or MRL standard; Instrument related QC is outside acceptance limits

F1 = MS and/or MSD Recovery is outside acceptance limits

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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.

M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

U = Target analyte was analyzed for, but was below detection limit

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-12**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE											
			4/1/2016	6/2/2016	8/16/2016	10/25/2016	1/27/2017	5/1/2017	8/11/2017	9/20/2017	10/9/2017	4/29/2018	5/7/2018	
			Baseline Events						Detection Events					
Boron	0.9744	mg/L	0.174 JB	0.186 J	0.280 JB	0.286 J	0.335 JB	0.306 JB	0.296 JB	0.334 J	0.274 J	0.717	0.352	
Calcium	415	mg/L	68.6	95.1 B	81.0	99.4	87.7	90.9 B	88.5	94.5	92 B	345	93.5	
Chloride	3,967	mg/L	29.0 B	32.4 B	26.9 B	26.2 B	24.6 JB	21.7 B	21.0 JB	19.8 B	17.4 B	1900	15.4	
Fluoride	0.891	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND J	ND JB	ND J	0.227 J	ND J	
pH (Field Measurement)	6.367 - 7.552	s.u.	7.85	7.4	7.52	7.33	7.65	5.02	6.56	7.07	7.07	7.11	7.34	
Sulfate	2,023	mg/L	168	146	95.7	64.0 B	54	41.3 B	33.8 J	25.3 J	19.7 B	949 B	13.5 B	
Total Dissolved Solids	5,418	mg/L	472	745	726	677	679	676	674	758	641	4890 B	649	
<b>APPENDIX IV CONSTITUENTS</b>														
Antimony	--	mg/L	0.00204	ND JB	ND JB	ND	ND JB	ND JB	ND JB	ND JB	NA		NA	
Arsenic	--	mg/L	0.00596	0.00566	ND J	ND J	ND J	ND JB	ND J	ND JB	NA		NA	
Barium	--	mg/L	ND J	ND J	ND J	ND J	ND J	ND JB	ND J	ND J	NA		NA	
Beryllium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA		NA	
Cadmium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA		NA	
Chromium	--	mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND J	NA		NA	
Cobalt	--	mg/L	ND	ND J	ND J	ND J	ND J	ND JB	ND J	ND J	NA		NA	
Fluoride	--	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND J	ND JB	NA	0.227 J	NA	
Lead	--	mg/L	ND J	ND JB	ND	ND	ND	ND	ND J	ND J	NA		NA	
Lithium	--	mg/L	0.0100 J	0.0194 J	0.0173 J	0.0208 J	0.0215 J	0.0169 JB	0.0244 J	0.0229 J	NA		NA	
Mercury	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA		NA	
Molybdenum	--	mg/L	0.0769	0.0234	0.0141	0.0123	0.0100	ND JB	ND J	ND J	NA		NA	
Radium 226	--	pCi/L	0.842	ND	ND	0.954	0.361	0.556	0.566	ND	NA		NA	
Radium 228														
Selenium	--	mg/L	ND J	ND	ND	ND	ND	ND JB	ND	ND	NA		NA	
Thallium	--	mg/L	ND	ND	ND	ND	ND	ND JB	ND	ND	NA		NA	

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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

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D1 = Sample required dilution due to high concentration of target analysis

D2 = Sample required dilution due to matrix interference

D = Results reported from dilution

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

M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY**  
MW-12

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE									
			9/27/2018	4/29/2019	10/4/2019	4/8/2020	9/25/2020	4/23/2021	9/24/2021	4/21/2022	10/1/2022	
			Detection Events									
Boron	0.9744	mg/L	0.335 B	0.290	ND D2, U	0.31	<1.00 D2	0.31	<1.0 D2, U	0.31	0.27	
Calcium	415	mg/L	96.4	93.1	92.0 D2	98.3 D2	89.6 D2	91.5 D1	91.8 D2	93.6 D1	87.2 D1	
Chloride	3,967	mg/L	15.5 B	15.1	14.0	13.9	13.5	14.7	16.2	11.1	15.7	
Fluoride	0.891	mg/L	ND J	0.428 J	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
pH (Field Measurement)	6.367 - 7.552	s.u.	6.84	7.36	7.07	6.90	6.83	7.33	6.52	6.77	7.30	
Sulfate	2,023	mg/L	14.3	11.9 B	11	9	8	14	31 D	4 J	41	
Total Dissolved Solids	5,418	mg/L	595	618 B	546	532	658	576	622	582 J+	684	
<b>APPENDIX IV CONSTITUENTS</b>												
Antimony	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Arsenic	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Barium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Beryllium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Cadmium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Chromium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Cobalt	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Fluoride	--	mg/L	NA	0.428 J	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Lead	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Lithium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Mercury	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Molybdenum	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Radium 226	--	pCi/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Radium 228												
Selenium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Thallium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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 high bias during data review.

B = Compound was found in the blank and sample

U = Target analyte was analyzed for, but was below detection limit

D1 = Sample required dilution due to high concentration of target analysis

D2 = Sample required dilution due to matrix interference

D = Results reported from dilution

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



**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-13**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE																			
			4/1/2016		6/2/2016		8/16/2016		10/25/2016		1/27/2017		5/1/2017		8/11/2017		9/20/2017		10/9/2017		4/29/2018	
			Baseline Events																Detection Events			
Boron	0.9744	mg/L	ND	B	ND	J	ND	JB	ND	J	ND	JB	ND	JB	ND	JB	ND	J	ND	J	0.717	
Calcium	415	mg/L	93.0		95.1	B	85.1		94.5		82.8		90.2	B	92.3		94.3		92.2	B	345	
Chloride	3,967	mg/L	20.5	B	25.2	B	22.3	B	24.8	B	22.2	JB	21.4	B	21.6	JB	21.3	JB	19.9	B	1900	
Fluoride	0.891	mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J	ND	JB	ND	J	0.227	J
pH (Field Measurement)	6.367 - 7.552	s.u.	6.78		6.9		6.97		6.86		7.22		8.25		6.48		6.64		6.62		7.11	
Sulfate	2,023	mg/L	118		118		106		104	B	96.2		98.1	J	96.6		88.0		96.4	B	949	B
Total Dissolved Solids	5,418	mg/L	699		721		684		704		678		714		702		727		695		4890	B
<b>APPENDIX IV CONSTITUENTS</b>																						
Antimony	--	mg/L	ND		ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB	ND	JB	NA			
Arsenic	--	mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	NA			
Barium	--	mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	NA			
Beryllium	--	mg/L	ND		ND		ND		ND		ND		ND		ND		ND		NA			
Cadmium	--	mg/L	ND		ND		ND		ND		ND		ND		ND		ND		NA			
Chromium	--	mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J	NA			
Cobalt	--	mg/L	0.00378	J	0.00221	J	0.0018	J	0.00149	J	0.000720	J	0.00115	J	0.0009	J	0.000981	J	NA			
Fluoride	--	mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J	ND	JB	NA		0.227	J
Lead	--	mg/L	ND	J	ND	JB	ND		ND		ND		ND		ND		ND		NA			
Lithium	--	mg/L	0.00929	J	0.0104	J	0.0123	J	0.0104	J	0.0113	J	ND		0.0111	J	ND		NA			
Mercury	--	mg/L	ND		ND		ND		ND		ND		ND		ND		ND		NA			
Molybdenum	--	mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	NA			
Radium 226	--	pCi/L	ND		ND		ND		ND		ND		0.164	0.47	0.749		NA					
Radium 228																						
Selenium	--	mg/L	ND		ND		ND	J	ND		ND		ND		ND		ND		NA			
Thallium	--	mg/L	ND		ND		ND		ND		ND		ND		ND		ND		NA			

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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.

U = Target analyte was analyzed for, but was below detection limit

D1 = Sample required dilution due to high concentration of target analysis

D2 = Sample required dilution due to matrix interference

D = Results reported from dilution

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

M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-13**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE													
			5/7/2018	9/27/2018	4/29/2019	10/4/2019	4/8/2020	9/25/2020	4/23/2021	9/24/2021	4/21/2022	10/1/2022				
			Detection Events													
Boron	0.9744	mg/L	ND J	0.0565 JB	0.0392 J	ND D2, U	<0.10	<1.00 D2	<0.10 U	<1.0 D2, U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	<0.10 U	
Calcium	415	mg/L	94.3	95.6	95.1	87.4 D2	86.6 D2	84.9 D2	90.1 D1	87.9 D2	91.4 D1	94.9 D1				
Chloride	3,967	mg/L	21.0	26.6 B	24.4	24.6	22.8	33.3 D	26.4 D	32.3 D	25.3	23.2				
Fluoride	0.891	mg/L	ND J	ND J	0.271 J	0.2	0.3	0.4 D	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
pH (Field Measurement)	6.367 - 7.552	s.u.	7.03	6.54	6.94	6.75	6.53	6.80	6.77	6.51	6.61	6.88				
Sulfate	2,023	mg/L	87.6 B	109 B	98.6 B	41	117 D	87 D	82 D	121 D	93	87				
Total Dissolved Solids	5,418	mg/L	673	697	711 B	586	608	552	706	754	676 J+	840				
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Arsenic	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Barium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Beryllium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Cadmium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Chromium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Cobalt	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Fluoride	--	mg/L	NA	NA	0.271 J	0.2	0.3	0.4 D	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Lead	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Lithium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Mercury	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Molybdenum	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Radium 226	--	pCi/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Radium 228																
Selenium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Thallium	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	

GWPS = Groundwater Protection Standard  
mg/L = milligrams per liter  
NA = Not Analyzed  
ND = Not Detected at or above Method Detection Limit  
pCi/L = picocuries per Liter  
s.u. = standard units  
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 high bias during review.  
B = Compound was found in the blank and sample.  
U = Target analyte was analyzed for, but was below detection limit  
D1 = Sample required dilution due to high concentration of target analysis  
D2 = Sample required dilution due to matrix interference  
D = Results reported from dilution  
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  
M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-14**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE											
			4/1/2016	6/2/2016	8/16/2016	10/25/2016	1/27/2017	5/1/2017	8/11/2017	9/20/2017	10/9/2017	5/7/2018		
			Baseline Events									Detection Events		
Boron	0.9744	mg/L	0.196 JB	0.186 J	0.234 JB	0.209 J	0.250 JB	0.234 JB	0.277 JB	0.273 J	0.241 J	0.254		
Calcium	415	mg/L	194	194 B	171	193	183	193 B	193	187	194 B	189		
Chloride	3,967	mg/L	161 B	184 B	185 B	193 B	191 B	185 B	212 B	230 B	199 B	198 B		
Fluoride	0.891	mg/L	ND J	ND J	ND J	ND JB	ND J	ND JB	ND JB	ND JB	ND J	ND		
pH (Field Measurement)	6.367 - 7.552	s.u.	6.63	6.35	7.43	7.34	7.78	5.23	7.33	7.13	7.32	7.26		
Sulfate	2,023	mg/L	188	219	216	215 B	221	197 B	179	198 J	185	222 B		
Total Dissolved Solids	5,418	mg/L	1080	1130	1140	1130	1150	1170	1150	1240	1170	1180		
<b>APPENDIX IV CONSTITUENTS</b>														
Antimony	--	mg/L	ND	ND JB	ND JB	ND	ND JB	ND JB	ND JB	ND JB	NA	NA		
Arsenic	--	mg/L	ND J	ND J	ND J	ND J	ND J	ND JB	ND J	ND JB	NA	NA		
Barium	--	mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	NA		
Beryllium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Cadmium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Chromium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND J	NA	NA		
Cobalt	--	mg/L	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	NA		
Fluoride	--	mg/L	ND J	ND J	ND J	ND JB	ND	ND JB	ND J	ND JB	NA	NA		
Lead	--	mg/L	ND	ND JB	ND	ND	ND	ND	ND	ND J	NA	NA		
Lithium	--	mg/L	0.0400 J	0.0488 J	0.0477 J	0.0456 J	0.0486 J	0.0437 J	0.0494 J	0.0496 J	NA	NA		
Mercury	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Molybdenum	--	mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND	NA	NA		
Radium 226	--	pCi/L	1.54	1.42	1.86	1.55	1.31	2.17	2.85	1.8	NA	NA		
Radium 228														
Selenium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		
Thallium	--	mg/L	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA		

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

NA = Not Analyzed

ND = Not Detected at or above Method Detection Limit

pCi/L = picocuries per Liter

s.u. = standard units

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.

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D1 = Sample required dilution due to high concentration of target analysis

D2 = Sample required dilution due to matrix interference

D = Results reported from dilution

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

M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.

**GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
MW-14**

APPENDIX III CONSTITUENTS	2023 Calculated Background	Units	DATE																
			9/27/2018	4/28/2019	4/29/2019	10/3/2019	4/8/2020	9/25/2020	4/23/2021	9/24/2021	4/21/2022	10/1/2022	Detection Events						
Boron	0.9744	mg/L	0.232 B	0.717	0.206	ND	D2, U	0.20		<1.00	D2	0.17		<1.0	D2, U	0.16		0.14	
Calcium	415	mg/L	200	345	206	194	D1	195	D1	194	D2	199	D1	212	D1	181	D,D1	200	D1
Chloride	3,967	mg/L	189 B	1900	165	262	D	121	D	131	D	117	D	186	D	159	D	137	D
Fluoride	0.891	mg/L	ND	J	0.227	J	0.342	J	0.3	0.3	0.3	0.2		0.3		0.3		0.3	
pH (Field Measurement)	6.367 - 7.552	s.u.	6.57	7.11	7.05	6.77		6.57		6.75		6.88		6.52		6.52		6.99	
Sulfate	2,023	mg/L	231 B	949 B	222 B	871	D	183	D	221	D	180	D	324	D	286	D	178	
Total Dissolved Solids	5,418	mg/L	1100	4890 B	1180 B	1120	H2	1030		946		1040		1050		1230		1060	
<b>APPENDIX IV CONSTITUENTS</b>																			
Antimony	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Arsenic	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Barium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Beryllium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Cadmium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Chromium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Cobalt	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Fluoride	--	mg/L	NA	0.227 J	0.342 J	0.3		0.3		0.3		0.2		0.3		0.3		0.3	
Lead	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Lithium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Mercury	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Molybdenum	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Radium 226	--	pCi/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Radium 228			NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Selenium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	
Thallium	--	mg/L	NA	NA	NA	NA		NA		NA		NA		NA		NA		NA	

GWPS = Groundwater Protection Standard

mg/L = milligrams per liter

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M4 = The analysis of the spiked sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable.



**APPENDIX F - GREEN LANDFILL LABORATORY  
ANALYTICAL REPORTS**

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## Certificate of Analysis 3061146

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 10/12/2023 15:18

Project Name: Green Landfill Semiannual Groundwater	Workorder: 3061146
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Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 06/26/2023 12:20.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3061146-01	MW1/	Groundwater	06/22/2023 10:00	06/26/2023 12:20	Greg Dick
3061146-02	MW2/	Groundwater	06/24/2023 07:50	06/26/2023 12:20	Greg Dick
3061146-03	MW3A/	Groundwater	06/23/2023 10:10	06/26/2023 12:20	Greg Dick
3061146-04	MW4/	Groundwater	06/22/2023 16:30	06/26/2023 12:20	Greg Dick
3061146-05	MW5/	Groundwater	06/22/2023 12:40	06/26/2023 12:20	Greg Dick
3061146-06	MW6/	Groundwater	06/22/2023 10:40	06/26/2023 12:20	Greg Dick
3061146-07	DUPLICATE/	Groundwater	06/23/2023 10:40	06/26/2023 12:20	Greg Dick
3061146-08	FIELD BLANK/	Water	06/24/2023 13:00	06/26/2023 12:20	Greg Dick

LabNumber	Measurement	Value
3061146-01	Field Conductance	980
	Field pH	7.15
	Field Temp (C)	15.50
3061146-02	Field Conductance	1910
	Field pH	6.33
	Field Temp (C)	16.34
3061146-03	Field Conductance	7400
	Field pH	6.94
	Field Temp (C)	15.27
3061146-04	Field Conductance	6040
	Field pH	6.52
	Field Temp (C)	16.19
3061146-05	Field Conductance	5690
	Field pH	6.47
	Field Temp (C)	15.33
3061146-06	Field Conductance	4920
	Field pH	6.60
	Field Temp (C)	16.57
3061146-07	Field Conductance	7400
	Field pH	6.94
	Field Temp (C)	15.27

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 8/1/2023@1630. Additional QC Data has been added to report.



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-01**  
 Description: **MW1**

Sample Collection Date Time: 06/22/2023 10:00  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Arsenic</b>	<b>0.0005</b>	J	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Barium</b>	<b>0.071</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Boron</b>	<b>1.92</b>	D1, M1, M2	mg/L	1.00	1.00	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:32	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Calcium</b>	<b>28.6</b>	D1, M1, M2	mg/L	4.00	1.30	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:32	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:29	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB
<b>Sodium</b>	<b>199</b>	D1, M3	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:35	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:08	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	u	mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>998</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>8.51</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/27/2023 15:36	06/28/2023 09:37	JEP
<b>Total Dissolved Solids</b>	<b>520</b>		mg/L	100	100	2540 C-2015	06/28/2023 13:05	06/28/2023 13:05	HAG
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 21:32	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.208</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>0.597</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>0.805</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>0.805</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>5.7</b>		mg/L	0.5	0.4	SW846 9056	07/03/2023 14:43	07/03/2023 14:43	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 13:30	07/05/2023 13:30	CSC
<b>Sulfate</b>	<b>31</b>		mg/L	1	0.5	SW846 9056	07/03/2023 14:43	07/03/2023 14:43	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-02**  
 Description: **MW2**

Sample Collection Date Time: 06/24/2023 07:50  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Arsenic</b>	<b>0.0323</b>		mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Barium</b>	<b>0.340</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:38	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Calcium</b>	<b>192</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:44	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Iron</b>	<b>22.8</b>	D1	mg/L	1.00	0.500	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:41	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB
<b>Sodium</b>	<b>58.4</b>	D1	mg/L	2.60	1.00	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:41	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:10	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>12</b>	J	mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>1890</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.54</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>1610</b>		mg/L	250	250	2540 C-2015	06/28/2023 13:05	06/28/2023 13:05	HAG
<b>Total Organic Carbon</b>	<b>1.4</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 21:54	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.546</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>0.950</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>1.50</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.50</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>218</b>	D	mg/L	2.5	1.8	SW846 9056	07/03/2023 15:38	07/03/2023 15:38	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 13:57	07/05/2023 13:57	CSC



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Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>156</b>		mg/L	1	0.5	SW846 9056	07/03/2023 15:10	07/03/2023 15:10	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-03**  
 Description: **MW3A**

Sample Collection Date Time: 06/23/2023 10:10  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:12	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
<b>Barium</b>	<b>0.035</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
<b>Boron</b>	<b>0.30</b>		mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:47	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
<b>Calcium</b>	<b>531</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:54	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:47	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
<b>Lithium</b>	<b>0.64</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB
<b>Sodium</b>	<b>354</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 17:54	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:12	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>113</b>		mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>8260</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.82</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>5090</b>		mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>0.6</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 22:15	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.379</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.05</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>1.43</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.43</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1820</b>	D	mg/L	10.0	7.2	SW846 9056	07/03/2023 13:16	07/03/2023 13:16	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 14:25	07/05/2023 14:25	CSC



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Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>1140</b>	D, M2	mg/L	20	10	SW846 9056	07/03/2023 13:16	07/03/2023 13:16	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-04**  
 Description: **MW4**

Sample Collection Date Time: 06/22/2023 16:30  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:15	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Barium</b>	<b>0.023</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Boron</b>	<b>1.20</b>	D1	mg/L	1.00	1.00	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:10	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Calcium</b>	<b>725</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:13	MRWD
<b>Chromium</b>	<b>0.0018</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:06	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Lithium</b>	<b>1.20</b>	D1	mg/L	0.20	0.05	SW846-6020 A	06/27/2023 10:46	06/30/2023 14:48	AKB
<b>Mercury</b>	<b>0.0004</b>	J	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Selenium</b>	<b>0.003</b>		mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB
<b>Sodium</b>	<b>291</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:13	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:15	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>45</b>		mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>6620</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.69</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>4660</b>	H2	mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 22:36	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.161</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.93</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>2.09</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>2.09</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1130</b>	D	mg/L	5.0	3.6	SW846 9056	07/03/2023 14:11	07/03/2023 14:11	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 14:52	07/05/2023 14:52	CSC





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Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>1650</b>	D	mg/L	10	5	SW846 9056	07/03/2023 14:11	07/03/2023 14:11	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-05**  
 Description: **MW5**

Sample Collection Date Time: 06/22/2023 12:40  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:28	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
<b>Barium</b>	<b>0.012</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
<b>Boron</b>	<b>0.24</b>		mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:16	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
<b>Calcium</b>	<b>485</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:22	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:16	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
<b>Lithium</b>	<b>0.33</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB
<b>Sodium</b>	<b>200</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:22	MRWD
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:28	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>44</b>		mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>5340</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.71</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>4220</b>	H2	mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>	M7	mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 22:58	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>-0.261</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.69</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>1.69</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.69</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1020</b>	D	mg/L	5.0	3.6	SW846 9056	07/03/2023 15:05	07/03/2023 15:05	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 15:19	07/05/2023 15:19	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>1900</b>	D	mg/L	10	5	SW846 9056	07/03/2023 15:05	07/03/2023 15:05	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-06**  
 Description: **MW6**

Sample Collection Date Time: 06/22/2023 10:40  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:31	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Barium</b>	<b>0.011</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Boron</b>	<b>0.19</b>		mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:25	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Calcium</b>	<b>408</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:32	MRWD
<b>Chromium</b>	<b>0.0008</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:25	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB
<b>Sodium</b>	<b>443</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:32	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:31	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	u	mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>4450</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.64</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>4760</b>	H2	mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>2.2</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 23:19	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.047</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.35</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>1.40</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.40</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>144</b>	D	mg/L	5.0	3.6	SW846 9056	07/03/2023 16:00	07/03/2023 16:00	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 15:47	07/05/2023 15:47	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>2360</b>	D	mg/L	10	5	SW846 9056	07/03/2023 16:00	07/03/2023 16:00	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-07**  
 Description: **DUPLICATE**

Sample Collection Date Time: 06/23/2023 10:40  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:33	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
<b>Barium</b>	<b>0.038</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
<b>Boron</b>	<b>0.32</b>		mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:44	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
<b>Calcium</b>	<b>515</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:51	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:44	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
<b>Lithium</b>	<b>0.58</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB
<b>Sodium</b>	<b>334</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:51	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:33	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>78</b>		mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>8340</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>7.87</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>4860</b>		mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/28/2023 23:41	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.278</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.37</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>1.65</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>1.65</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>4460</b>	D	mg/L	50.0	36.0	SW846 9056	07/06/2023 18:04	07/06/2023 18:04	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 17:09	07/05/2023 17:09	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>1180</b>	D	mg/L	10	5	SW846 9056	07/03/2023 16:55	07/03/2023 16:55	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061146-08**  
 Description: **FIELD BLANK**

Sample Collection Date Time: 06/24/2023 13:00  
 Sample Received Date Time: 06/26/2023 12:20

**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	06/27/2023 10:46	06/29/2023 18:35	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Barium	ND	u	mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:54	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:54	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
<b>Copper</b>	<b>0.010</b>		mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:54	MRWD
<b>Lead</b>	<b>0.0009</b>	J	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB
Sodium	ND	u	mg/L	0.26	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 18:54	MRWD
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:35	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	u	mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>Specific Conductance (Lab)</b>	<b>97</b>		umhos/cm	1	1	2510 B-2011	06/26/2023 16:01	06/28/2023 16:55	JEP
<b>pH (Lab)</b>	<b>5.85</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
Total Dissolved Solids	ND	u	mg/L	50	50	2540 C-2015	06/28/2023 13:05	06/28/2023 13:05	HAG
<b>Total Organic Carbon</b>	<b>0.6</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/29/2023 00:02	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.118</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>3.48</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>3.60</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>3.60</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	u	mg/L	0.5	0.4	SW846 9056	07/03/2023 16:05	07/03/2023 16:05	CSC
Fluoride	ND	M1, U	mg/L	0.2	0.2	SW846 9056	07/05/2023 18:04	07/05/2023 18:04	CSC



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Sulfate	ND	u	mg/L	1	0.5	SW846 9056	07/03/2023 16:05	07/03/2023 16:05	CSC

**Notes for work order 3061146**

- 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.
- H2 Initial analysis within holding time. Reanalysis was past holding time.
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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.
- M7 Matrix spike recovery was low.
- 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/Acronyms**

- 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



**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
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**Batch BCF2432 - EPA 200.2**

**Blank (BCF2432-BLK1)**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 17:10

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (BCF2432-BLK2)**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:03

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
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**LCS (BCF2432-BS1)**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 17:13

Boron	0.12	0.10	mg/L	0.125		97.4	85-115			
Calcium	6.09	0.40	mg/L	6.25		97.4	85-115			
Iron	6.15	0.100	mg/L	6.25		98.4	85-115			
Sodium	5.68	0.26	mg/L	6.25		90.8	85-115			

**LCS (BCF2432-BS2)**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:06

Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		103	85-115			
Antimony	0.065	0.005	mg/L	0.0625		104	85-115			
Arsenic	0.0604	0.0010	mg/L	0.0625		96.7	85-115			
Barium	0.062	0.004	mg/L	0.0625		98.6	85-115			
Beryllium	0.0599	0.0020	mg/L	0.0625		95.8	85-115			
Cadmium	0.0597	0.0010	mg/L	0.0625		95.5	85-115			
Chromium	0.0616	0.0020	mg/L	0.0625		98.6	85-115			
Cobalt	0.061	0.004	mg/L	0.0625		98.2	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.8	85-115			
Lead	0.062	0.002	mg/L	0.0625		99.8	85-115			
Lithium	0.06	0.02	mg/L	0.0625		94.9	85-115			
Selenium	0.058	0.003	mg/L	0.0625		92.2	85-115			
Thallium	0.0619	0.0020	mg/L	0.0625		99.0	85-115			





**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
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**Batch BCF2432 - EPA 200.2**

**Matrix Spike (BCF2432-MS1) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:22

Boron	1.84	1.00	mg/L	0.125	1.92	NR	80-120			D2, M2
Calcium	34.2	4.00	mg/L	6.25	28.6	89.4	80-120			D2
Iron	6.35	1.00	mg/L	6.25	ND	102	80-120			D2
Sodium	190	2.60	mg/L	6.25	199	NR	80-120			D2, M3

**Matrix Spike (BCF2432-MS2) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:40

Mercury	0.0024	0.0005	mg/L	0.00250	ND	94.3	80-120			
Antimony	0.065	0.005	mg/L	0.0625	ND	105	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Arsenic	0.0632	0.0010	mg/L	0.0625	0.0005	100	80-120			
Barium	0.137	0.004	mg/L	0.0625	0.071	105	80-120			
Beryllium	0.0607	0.0020	mg/L	0.0625	ND	97.1	80-120			
Cadmium	0.0601	0.0010	mg/L	0.0625	ND	96.2	80-120			
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120			
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.6	80-120			
Copper	0.060	0.003	mg/L	0.0625	ND	96.7	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.0	80-120			
Lithium	0.08	0.02	mg/L	0.0625	0.03	91.7	80-120			
Selenium	0.058	0.003	mg/L	0.0625	ND	92.7	80-120			
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.1	80-120			

**Matrix Spike Dup (BCF2432-MSD1) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:25

Boron	1.91	1.00	mg/L	0.125	1.92	NR	80-120	3.55	20	D2, M2
Calcium	33.4	4.00	mg/L	6.25	28.6	76.3	80-120	2.42	20	D2, M2
Iron	6.09	1.00	mg/L	6.25	ND	97.4	80-120	4.28	20	D2
Sodium	187	2.60	mg/L	6.25	199	NR	80-120	1.94	20	D2, M3

**Matrix Spike Dup (BCF2432-MSD2) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:42

Antimony	0.062	0.005	mg/L	0.0625	ND	99.3	80-120	5.36	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	80-120	4.48	20	
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.7	80-120	1.71	20	
Arsenic	0.0606	0.0010	mg/L	0.0625	0.0005	96.1	80-120	4.23	20	
Barium	0.133	0.004	mg/L	0.0625	0.071	99.5	80-120	2.77	20	
Beryllium	0.0554	0.0020	mg/L	0.0625	ND	88.6	80-120	9.18	20	
Cadmium	0.0569	0.0010	mg/L	0.0625	ND	91.0	80-120	5.50	20	
Chromium	0.0593	0.0020	mg/L	0.0625	ND	95.0	80-120	4.50	20	
Cobalt	0.058	0.004	mg/L	0.0625	ND	93.0	80-120	4.80	20	
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120	5.05	20	
Lead	0.057	0.002	mg/L	0.0625	ND	91.1	80-120	5.22	20	
Lithium	0.08	0.02	mg/L	0.0625	0.03	84.8	80-120	5.26	20	
Selenium	0.056	0.003	mg/L	0.0625	ND	89.6	80-120	3.44	20	
Thallium	0.0564	0.0020	mg/L	0.0625	ND	90.3	80-120	6.25	20	



**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
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**Batch BCF2432 - EPA 200.2**

**Post Spike (BCF2432-PS1) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:29

Boron	2.08	1.00	mg/L	0.125	1.92	131	75-125			D2, M1
Calcium	37.2	4.00	mg/L	6.25	28.6	137	75-125			D2, M1
Iron	6.80	1.00	mg/L	6.25	ND	109	75-125			D2
Sodium	208	2.60	mg/L	6.25	199	137	75-125			D2, M3

**Post Spike (BCF2432-PS2) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:45

Mercury	0.0025	0.0005	mg/L	0.00250	ND	98.4	75-125			
Antimony	0.064	0.005	mg/L	0.0625	ND	102	75-125			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	75-125			
Arsenic	0.0620	0.0010	mg/L	0.0625	0.0005	98.4	75-125			
Barium	0.135	0.004	mg/L	0.0625	0.071	102	75-125			
Beryllium	0.0572	0.0020	mg/L	0.0625	ND	91.6	75-125			
Cadmium	0.0593	0.0010	mg/L	0.0625	ND	94.9	75-125			
Chromium	0.0605	0.0020	mg/L	0.0625	ND	96.8	75-125			
Cobalt	0.059	0.004	mg/L	0.0625	ND	95.0	75-125			
Copper	0.059	0.003	mg/L	0.0625	ND	94.0	75-125			
Lead	0.058	0.002	mg/L	0.0625	ND	92.1	75-115			
Lithium	0.08	0.02	mg/L	0.0625	0.03	85.7	75-125			
Selenium	0.057	0.003	mg/L	0.0625	ND	91.3	75-125			
Thallium	0.0573	0.0020	mg/L	0.0625	ND	91.6	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCF2393 - Default Prep Micro

LCS (BCF2393-BS1)

Prepared: 6/26/2023 15:57, Analyzed: 6/27/2023 16:23

pH (Lab)	5.07		Std. Units	5.00		101	98.8-101.2			
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Duplicate (BCF2393-DUP1) Source: 3061147-01

Prepared: 6/26/2023 15:57, Analyzed: 6/27/2023 16:23

pH (Lab)	7.78	0.10	Std. Units		7.77			0.129	10	H3
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Batch BCF2395 - Default Prep Micro

Blank (BCF2395-BLK1)

Prepared: 6/26/2023 16:01, Analyzed: 6/28/2023 16:55

Specific Conductance (Lab)	ND		1 umhos/cm							U
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LCS (BCF2395-BS1)

Prepared: 6/26/2023 16:01, Analyzed: 6/28/2023 16:55

Specific Conductance (Lab)	1400		umhos/cm	1410		99.5	80-120			
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Duplicate (BCF2395-DUP1) Source: 3064032-01

Prepared: 6/26/2023 16:01, Analyzed: 6/28/2023 16:55

Specific Conductance (Lab)	1200		1 umhos/cm		1200			0.167	0.938	
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Batch BCF2466 - Default Prep Wet Chem

Blank (BCF2466-BLK1)

Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10

Chemical Oxygen Demand	ND		13 mg/L							U
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LCS (BCF2466-BS1)

Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10

Chemical Oxygen Demand	124	13	mg/L	125		99.2	90-110			
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Duplicate (BCF2466-DUP1) Source: 3061146-06

Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10

Chemical Oxygen Demand	ND	13	mg/L		ND				25	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
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Batch BCF2466 - Default Prep Wet Chem

Matrix Spike (BCF2466-MS1) Source: 3061146-06

Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10

Chemical Oxygen Demand	251	13	mg/L	250	ND	100	90-110			
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Matrix Spike Dup (BCF2466-MSD1) Source: 3061146-06

Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10

Chemical Oxygen Demand	252	13	mg/L	250	ND	101	90-110	0.398	10	
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Batch BCF2502 - Default Prep Micro

LCS (BCF2502-BS1)

Prepared: 6/27/2023 15:36, Analyzed: 6/28/2023 9:37

pH (Lab)	5.04		Std. Units	5.00		101	98.8-101.2			
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Duplicate (BCF2502-DUP1) Source: 3064063-03

Prepared: 6/27/2023 15:36, Analyzed: 6/28/2023 9:37

pH (Lab)	6.78	0.10	Std. Units		6.77			0.148	10	H3
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Batch BCF2535 - Default Prep Wet Chem

Blank (BCF2535-BLK1)

Prepared: 6/28/2023 9:14, Analyzed: 6/28/2023 20:28

Total Organic Carbon	ND	0.5	mg/L							U
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LCS (BCF2535-BS1)

Prepared: 6/28/2023 9:14, Analyzed: 6/28/2023 20:49

Total Organic Carbon	4.8	0.5	mg/L	5.00		96.2	80-120			
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Duplicate (BCF2535-DUP1) Source: 3061146-05

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 16:31

Total Organic Carbon	0.7	0.5	mg/L		0.7			4.03	25	
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Duplicate (BCF2535-DUP2) Source: 3063918-02

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 20:57

Total Organic Carbon	1.4	0.5	mg/L		1.6			11.3	25	
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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
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Batch BCF2535 - Default Prep Wet Chem

Matrix Spike (BCF2535-MS1) Source: 3061146-05

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 16:53

Total Organic Carbon	2.5	0.5	mg/L	2.50	0.7	72.8	80-120			M7
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Matrix Spike (BCF2535-MS2) Source: 3063918-02

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 21:19

Total Organic Carbon	6.0	0.5	mg/L	5.00	1.6	87.9	80-120			
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Batch BCF2540 - Default Prep Wet Chem

Blank (BCF2540-BLK1)

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCF2540-BS1)

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	1500	25	mg/L	1500		99.9	80-120			
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Duplicate (BCF2540-DUP1) Source: 3061146-01

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	508	100	mg/L		520			2.33	10	
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Duplicate (BCF2540-DUP2) Source: 3064088-01

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	304	50	mg/L		298			1.99	10	
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Batch BCF2838 - Default Prep Wet Chem

Blank (BCF2838-BLK1)

Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCF2838-BS1)

Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45

Total Dissolved Solids	1490	25	mg/L	1500		99.4	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
<b>Batch BCF2838 - Default Prep Wet Chem</b>										
<b>Duplicate (BCF2838-DUP1)</b>		<b>Source: 3032610-01</b>								
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1040	100	mg/L		1070			3.03	10	
<b>Duplicate (BCF2838-DUP2)</b>		<b>Source: 3063392-01</b>								
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	7800	100	mg/L		7780			0.205	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0014 - Default Prep IC**

**Blank (BCG0014-BLK1)**

Prepared: 7/3/2023 12:06, Analyzed: 7/3/2023 12:06

Fluoride	ND	0.2	mg/L							U
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**Blank (BCG0014-BLK2)**

Prepared: 7/3/2023 12:06, Analyzed: 7/3/2023 12:06

Fluoride	ND	0.2	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1	mg/L							U

**LCS (BCG0014-BS1)**

Prepared: 7/3/2023 11:39, Analyzed: 7/3/2023 11:39

Fluoride	4.7		mg/L	5.00		93.7	90-110			
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**LCS (BCG0014-BS2)**

Prepared: 7/3/2023 11:39, Analyzed: 7/3/2023 11:39

Fluoride	4.7		mg/L	5.00		93.7	90-110			
Chloride	12.1		mg/L	12.5		96.8	90-110			
Sulfate	24		mg/L	25.0		96.7	90-110			

**Matrix Spike (BCG0014-MS1)**

Source: 3061146-03

Prepared: 7/3/2023 18:17, Analyzed: 7/3/2023 18:17

Chloride	0.0		mg/L	12.5	1640	NR	75-125			M1, U
Fluoride	5.4		mg/L	5.00	0.4	99.6	75-125			
Sulfate	917		mg/L	25.0	1030	NR	75-125			M2

**Matrix Spike Dup (BCG0014-MSD1)**

Source: 3061146-03

Prepared: 7/3/2023 18:45, Analyzed: 7/3/2023 18:45

Fluoride	5.2		mg/L	5.00	0.4	94.9	75-125	4.42	15	
Chloride	0.0		mg/L	12.5	1640	NR	75-125		15	M1, U
Sulfate	965		mg/L	25.0	1030	NR	75-125	5.05	15	M2

**Batch BCG0086 - Default Prep IC**

**Blank (BCG0086-BLK1)**

Prepared: 7/3/2023 12:06, Analyzed: 7/3/2023 12:06

Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0086 - Default Prep IC**

**LCS (BCG0086-BS1)**

Prepared: 7/3/2023 11:38, Analyzed: 7/3/2023 11:38

Chloride	12.0		mg/L	12.5		96.3	90-110			
Fluoride	5.0		mg/L	5.00		101	90-110			
Sulfate	24		mg/L	25.0		95.3	90-110			

**Matrix Spike (BCG0086-MS1) Source: 3061146-08**

Prepared: 7/3/2023 22:28, Analyzed: 7/3/2023 22:28

Fluoride	5.8		mg/L	5.00	0.0	115	75-125			
Chloride	13.3		mg/L	12.5	0.06	106	75-125			
Sulfate	27		mg/L	25.0	0.2	107	75-125			

**Matrix Spike Dup (BCG0086-MSD1) Source: 3061146-08**

Prepared: 7/3/2023 22:56, Analyzed: 7/3/2023 22:56

Fluoride	6.5		mg/L	5.00	0.0	129	75-125	11.4	15	M1
Chloride	15.1		mg/L	12.5	0.06	120	75-125	12.6	15	
Sulfate	31		mg/L	25.0	0.2	122	75-125	13.4	15	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2510 B-2011 in Water</b>	
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 FL Drinking Water Mdv (E871159)
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>5310 C-2014 in Water</b>	
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 MS Drinking Water MADV
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)



**Sample Acceptance Checklist for Work Order 3061146**

Shipped By: Client

Temperature: 5.70° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-03 C	<u>06/23/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 D	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 E	<u>06/23/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 F	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 G	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW3A	g / c	Radium Total (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 H	<u>06/23/23</u>	<u>1010</u>	AG 250mL pH<2 w/H2SO4	1	MW3A	g / c	TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							

Preservation Check Performed by: KED

Field data collected by: Greg Dick Greg Dick Date (mm/dd/yy) 06/23/23 Time (24 hr) 1010  
pH 6.94 Cond (umho) 7400 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Greg Dick Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220



# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

**\*required information\***

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146	(mm/dd/yy):	Time (24 hr):					
3061146-04 A	<u>06/22/23</u>	<u>1630</u>	Plastic 500mL pH<2 w/HNO3	1	MW4	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-04 B	<u>06/22/23</u>	<u>1630</u>	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056 COD TOC
3061146-04 C	<u>06/22/23</u>	<u>1630</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-04 D	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-04 E	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: KED

Field data collected by: Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1630  
pH 6.52 Cond (umho) 6040 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.19 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)

Greg Dick

KED

06/26/23

1220

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Shy Qiao  
\*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 N/A End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3061146 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-04 F	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-04 G	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW4	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-04 H	<u>06/22/23</u>	<u>1630</u>	AG 250mL pH<2 w/H2SO4	1	MW4	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-05 A	<u>06/22/23</u>	<u>1240</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-05 B	<u>06/22/23</u>	<u>1240</u>	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: KED

Field data collected by: Greg Dick Shy Qiao Date (mm/dd/yy) 06/22/23 Time (24 hr) 1240 <sup>"MW-5"</sup>

pH 6.47 Cond (umho) 5690 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.33 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Shy Qiao</u>	Received by: (Signature) <u>KED</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1221</u>
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# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): My O'Neil \*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 # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-05 C	<u>06/22/23</u>	<u>1240</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 D	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 E	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 F	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 G	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 H	<u>06/22/23</u>	<u>1240</u>	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							

Preservation Check Performed by: KCD

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Tot Cl (mg/L) _____	Free Cl (mg/L) _____	DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>My O'Neil</u>	Received by: (Signature) <u>KCD</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1221</u>
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# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146 Sample ID#	(mm/dd/yy):	Time (24 hr):					
3061146-06 A	<u>06/22/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 B	<u>06/22/23</u>	<u>1145</u>	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-06 C	<u>06/22/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 D	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 E	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							

Preservation Check Performed by: KCD

Field data collected by: Greg Dick Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1145

pH 6.60 Cond (umho) 4920 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.57 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)

Greg Dick

KCD

06/26/23

1221

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

Greg Dick  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Greg Dick*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time N/A End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-06 F	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-06 G	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW6	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-06 H	<u>06/22/23</u>	<u>1145</u>	AG 250mL pH<2 w/H2SO4	1	MW6	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-07 A	<u>06/23/23</u>	<u>1040</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-07 B	<u>06/23/23</u>	<u>1040</u>	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: *KED*

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_  
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)

*Greg Dick*

*KED*

06/26/23

1222



# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146 Sample ID#							
3061146-07 C	<u>06/23/23</u>	<u>1040</u>	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061146-07 D	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061146-07 E	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061146-07 F	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061146-07 G	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061146-07 H	<u>06/23/23</u>	<u>1040</u>	AG 250mL pH<2 w/H2SO4	1	DUPLICATE	g / c	TOC
			Preservation Check: pH:	<input checked="" type="checkbox"/>			

Preservation Check Performed by: ICED

Field data collected by: Greg Dick Date (mm/dd/yy) 06/23/23 Time (24 hr) 1040  
pH: 6.94 Cond (umho) 7400 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1222

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): [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 N/A End Time          Temp (oC)         

Effluent: Start Date          Start time          End Date          End Time          Temp (oC)         

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-08 A	<u>06/24/23</u>	<u>1300</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 B	<u>06/24/23</u>	<u>1300</u>	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-08 C	<u>06/24/23</u>	<u>1300</u>	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 D	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 E	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: ICED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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)

[Signature]

[Signature]

06/26/23

1222

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: \_\_\_\_\_

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-08 F	<u>06/24/23</u> <u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
		Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 G	<u>06/24/23</u> <u>1300</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
		Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 H	<u>06/24/23</u> <u>1300</u>	AG 250mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	TOC
		Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: KGD

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>KGD</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1222</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): [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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-01 A	<u>06/22/23</u>	<u>1000</u>	Plastic 500mL pH<2 w/HNO3	1	MW1	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B

Preservation Check: pH:

3061146-01 B 06/22/23 5000

Plastic 1L 1

MW1 g / c

pH (Lab) Conductivity (Lab) TDS  
Sulfate 9056 Chloride 9056 Fluoride  
9056

3061146-01 C 06/22/23 1000

Plastic 500mL pH<2  
w/H2SO4 1

MW1 g / c

COD TOC

Preservation Check: pH:

3061146-01 D 06/22/23 1000

Plastic 1L pH<2 w/HNO3 1  
Rad 226 (Sub)

MW1 g / c

Radium 226 (sub)

**Thermometer Serial Number**

181390287

181460057

Temp 57°C

Preservation Check Performed by: KCD

Field data collected by: [Signature] Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1000

pH 7.15 Cond (umho) 980 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.50 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)

[Signature]

Received by: (Signature)

[Signature]

Date (mm/dd/yy)

06/26/23

Time (24 hr)

1220

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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**

\*required information\*

Workorder # 3061146 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-01 E	06/22/23	1000	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-01 F	06/22/23	1000	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-01 G	06/22/23	1000	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW1	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-01 H	06/22/23	1000	AG 250mL pH<2 w/H2SO4	1	MW1	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: KED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220



# Chain of Custody

**Scheduled for: 06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State:  KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature):  [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  A/P  End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-02 A	<u> 06/24/23 </u>	<u> 0750 </u>	Plastic 500mL pH<2 w/HNO3	1	MW2	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-02 B	<u> 06/24/23 </u>	<u> 0750 </u>	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-02 C	<u> 06/24/23 </u>	<u> 0750 </u>	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-02 D	<u> 06/24/23 </u>	<u> 0750 </u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW2	g / c	Radium 226 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-02 E	<u> 06/24/23 </u>	<u> 0750 </u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							

Preservation Check Performed by:  ICED

Field data collected by:  [Signature] Greg Dick  Date (mm/dd/yy)  06/24/23  Time (24 hr)  0750   
pH  6.33  Cond (umho)  1910  Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC)  16.34  or (oF)  61.4  Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)  [Signature]  Received by: (Signature)  [Signature]  Date (mm/dd/yy)  06/26/23  Time (24 hr)  1220

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): *My Dick*  
\*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**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-02 F	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-02 G	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW2	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-02 H	<u>06/24/23</u>	<u>0750</u>	AG 250mL pH<2 w/H2SO4	1	MW2	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-03 A	<u>06/23/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/HNO3	1	MW3A	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-03 B	<u>06/23/23</u>	<u>1010</u>	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: *KED*

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) *My Dick* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220

# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Greg Dick*  
(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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-03 C	<u>06/23/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-03 D	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-03 E	<u>06/23/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-03 F	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-03 G	<u>06/23/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW3A	g / c	Radium Total (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3061146-03 H	<u>06/23/23</u>	<u>1010</u>	AG 250mL pH<2 w/H2SO4	1	MW3A	g / c	TOC
Preservation Check: pH : <input checked="" type="checkbox"/>							

Preservation Check Performed by: KED

Field data collected by: Greg Dick *Greg Dick* Date (mm/dd/yy) 06/23/23 Time (24 hr) 1010  
pH 6.94 Cond (umho) 7400 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Greg Dick* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220

# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
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PO Box 24  
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**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-04 A	<u>06/22/23</u>	<u>1630</u>	Plastic 500mL pH<2 w/HNO3	1	MW4	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3061146-04 B	<u>06/22/23</u>	<u>1630</u>	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-04 C	<u>06/22/23</u>	<u>1630</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	COD TOC
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3061146-04 D	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3061146-04 E	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				

Preservation Check Performed by: KGD

Field data collected by: Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1630

pH 6.52 Cond (umho) 6040 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.19 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>KGD</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1220</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Shy Orie

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 N/A End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-04 F	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-04 G	<u>06/22/23</u>	<u>1630</u>	Plastic 1L pH<2 w/HNO3 (Sub).	1	MW4	g / c	Radium Total (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-04 H	<u>06/22/23</u>	<u>1630</u>	AG 250mL pH<2 w/H2SO4	1	MW4	g / c	TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 A	<u>06/22/23</u>	<u>1240</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-05 B	<u>06/22/23</u>	<u>1240</u>	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: KED

Field data collected by: Greg Dick Shy Orie Date (mm/dd/yy) 06/22/23 <sup>MW=5</sup> Time (24 hr) 1240  
pH 6.77 Cond (umho) 5690 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.33 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Shy Orie Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1221



# Chain of Custody

Scheduled for: **06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): My Quis \*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 # 3061146 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-05 C	<u>06/22/23</u>	<u>1240</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-05 D	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-05 E	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-05 F	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-05 G	<u>06/22/23</u>	<u>1240</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-05 H	<u>06/22/23</u>	<u>1240</u>	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: KGD

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>My Quis</u>	Received by: (Signature) <u>KGD</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1221</u>
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# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-06 A	<u>06/22/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 B	<u>06/22/23</u>	<u>1145</u>	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-06 C	<u>06/22/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 D	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-06 E	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							

Preservation Check Performed by: KED

Field data collected by: Greg Dick Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1145

pH 6.60 Cond (umho) 492.0 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.57 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1221

# Chain of Custody

Scheduled for: **06/05/2023**



**Client: Big Rivers Electric Corporation**  
**Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State:   KY  

PO#:             
Quote#           

Please Print Legibly

Collected by (Signature):           Jhy Dick            
\*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	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
3061146	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
3061146-06 F	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-06 G	<u>06/22/23</u>	<u>1145</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW6	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-06 H	<u>06/22/23</u>	<u>1145</u>	AG 250mL pH<2 w/H2SO4	1	MW6	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-07 A	<u>06/23/23</u>	<u>1040</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-07 B	<u>06/23/23</u>	<u>1040</u>	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by:           KED          

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>          Jhy Dick          </u>	Received by: (Signature) <u>          KED          </u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1222</u>
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# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [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 N/A Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3061146 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-07 C	<u>06/23/23</u>	<u>1040</u>	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-07 D	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-07 E	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-07 F	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-07 G	<u>06/23/23</u>	<u>1040</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH :	<input checked="" type="checkbox"/>			
3061146-07 H	<u>06/23/23</u>	<u>1040</u>	AG 250mL pH<2 w/H2SO4	1	DUPLICATE	g / c	TOC
			Preservation Check: pH :	<input checked="" type="checkbox"/>			

Preservation Check Performed by: ICGD

Field data collected by: Greg Dick [Signature] Date (mm/dd/yy) 06/23/23 Time (24 hr) 1040

pH: 6.94 Cond (umho) 7400 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1222

# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
3061146	(mm/dd/yy):	Time (24 hr):					
3061146-08 A	<u>06/24/23</u>	<u>1300</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 B	<u>06/24/23</u>	<u>1300</u>	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-08 C	<u>06/24/23</u>	<u>1300</u>	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 D	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 E	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: ICED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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)

[Signature]

[Signature]

06/26/23

1222



# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: \_\_\_\_\_

Greg Dick  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-08 F	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 G	<u>06/24/23</u>	<u>1300</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061146-08 H	<u>06/24/23</u>	<u>1300</u>	AG 250mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: ICG D

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>ICG D</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1222</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): [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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-01 A	<u>06/22/23</u>	<u>1000</u>	Plastic 500mL pH<2 w/HNO3	1	MW1	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B

Preservation Check: pH:

3061146-01 B	<u>06/22/23</u>	<u>1000</u>	Plastic 1L	1	MW1	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056 COD TOC
3061146-01 C	<u>06/22/23</u>	<u>1000</u>	Plastic 500mL pH<2 w/H2SO4	1	MW1	g / c	

Preservation Check: pH:

3061146-01 D	<u>06/22/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW1	g / c	Radium 226 (sub)
--------------	-----------------	-------------	---	---	-----	-------	------------------

Preservation Check: pH:

**Thermometer Serial Number**  
181390287  
181460057  
Temp 57°C

Preservation Check Performed by: ICED

Field data collected by: [Signature] Greg Dick Date (mm/dd/yy) 06/22/23 Time (24 hr) 1000

pH 7.15 Cond (umho) 980 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.50 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-01 E	<u>06/22/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3061146-01 F	<u>06/22/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3061146-01 G	<u>06/22/23</u>	<u>1000</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW1	g / c	Radium Total (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3061146-01 H	<u>06/22/23</u>	<u>1000</u>	AG 250mL pH<2 w/H2SO4	1	MW1	g / c	TOC
				Preservation Check: pH: <input checked="" type="checkbox"/>			

Preservation Check Performed by: KED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) <u>Greg Dick</u>	Received by: (Signature) <u>KED</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1220</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature] *\*required information\**

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date 6/24/23 End Time 11:15 Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

*\*required information\**

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-02 A	<u>06/24/23</u>	<u>0750</u>	Plastic 500mL pH<2 w/HNO3	1	MW2	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-02 B	<u>06/24/23</u>	<u>0750</u>	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3061146-02 C	<u>06/24/23</u>	<u>0750</u>	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-02 D	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW2	g / c	Radium 226 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-02 E	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							

Preservation Check Performed by: ICED

Field data collected by: [Signature] Greg Dick Date (mm/dd/yy) 06/24/23 Time (24 hr) 0750

pH 6.33 Cond (umho) 1910 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.34 or (oF) 61.4 Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1220

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-5736  
PWS ID#:  
State:   KY  

PO#:       -        
Quote#       -      

Please Print Legibly

Collected by (Signature):   *Greg Dick*    
\*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   N/A   End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061146-02 F	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-02 G	<u>06/24/23</u>	<u>0750</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW2	g / c	Radium Total (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-02 H	<u>06/24/23</u>	<u>0750</u>	AG 250mL pH<2 w/H2SO4	1	MW2	g / c	TOC
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 A	<u>06/23/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/HNO3	1	MW3A	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
Preservation Check: pH: <input checked="" type="checkbox"/>							
3061146-03 B	<u>06/23/23</u>	<u>1010</u>	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by:   KED  

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Tot Cl (mg/L) _____	Free Cl (mg/L) _____	DO (mg/L) _____
	Turb. (NTU) _____	

Relinquished by: (Signature) <u>  <i>Greg Dick</i>  </u>	Received by: (Signature) <u>  <i>KED</i>  </u>	Date (mm/dd/yy) <u>  06/26/23  </u>	Time (24 hr) <u>  1220  </u>
_____	_____	_____	_____
_____	_____	_____	_____





October 11, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3061146-Revised Report  
Pace Project No.: 30600923

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on June 30, 2023. 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

(Greensburg, PA) - Revision 1 - This report replaces the August 1, 2023 report. This project was revised on October 11, 2023 to include QC sheets.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

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### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

---

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3061146-Revised Report  
Pace Project No.: 30600923

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30600923001	3061146-01	Water	06/22/23 10:00	06/30/23 09:30
30600923002	3061146-02	Water	06/24/23 07:50	06/30/23 09:30
30600923003	3061146-03	Water	06/23/23 10:10	06/30/23 09:30
30600923004	3061146-04	Water	06/22/23 16:30	06/30/23 09:30
30600923005	3061146-05	Water	06/22/23 12:40	06/30/23 09:30
30600923006	3061146-06	Water	06/22/23 10:40	06/30/23 09:30
30600923007	3061146-07	Water	06/23/23 10:40	06/30/23 09:30
30600923008	3061146-08	Water	06/24/23 13:00	06/30/23 09:30
30600923009	3061146-08 (MS)	Water	06/24/23 13:00	06/30/23 09:30
30600923010	3061146-08 (MSD)	Water	06/24/23 13:00	06/30/23 09:30

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30600923001	3061146-01	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923002	3061146-02	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923003	3061146-03	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923004	3061146-04	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923005	3061146-05	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923006	3061146-06	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923007	3061146-07	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923008	3061146-08	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30600923009	3061146-08 (MS)	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
30600923010	3061146-08 (MSD)	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-01</b> <b>Lab ID: 30600923001</b> Collected: 06/22/23 10:00      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.208 ± 0.409 (0.726)</b> C:NA T:79%	pCi/L	07/31/23 11:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.597 ± 0.412 (0.796)</b> C:84% T:79%	pCi/L	07/13/23 15:33	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.805 ± 0.821 (1.52)</b>	pCi/L	08/01/23 12:22	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-02</b> <b>Lab ID: 30600923002</b> Collected: 06/24/23 07:50      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.546 ± 0.432 (0.630)</b> C:NA T:78%	pCi/L	07/31/23 11:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.950 ± 0.462 (0.802)</b> C:86% T:78%	pCi/L	07/13/23 15:33	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.50 ± 0.894 (1.43)</b>	pCi/L	08/01/23 12:22	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-03</b> <b>Lab ID: 30600923003</b> Collected: 06/23/23 10:10      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.379 ± 0.362 (0.552)</b> C:NA T:83%	pCi/L	07/31/23 11:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.05 ± 0.461 (0.766)</b> C:85% T:83%	pCi/L	07/13/23 15:33	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.43 ± 0.823 (1.32)</b>	pCi/L	08/01/23 12:22	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-04</b> <b>Lab ID: 30600923004</b> Collected: 06/22/23 16:30      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.161 ± 0.315 (0.566)</b> C:NA T:82%	pCi/L	07/31/23 11:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.93 ± 0.630 (0.863)</b> C:78% T:82%	pCi/L	07/13/23 15:33	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.09 ± 0.945 (1.43)</b>	pCi/L	08/01/23 12:22	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-05</b> <b>Lab ID: 30600923005</b> Collected: 06/22/23 12:40      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.261 ± 0.271 (0.689)</b> C:NA T:82%	pCi/L	07/31/23 12:15	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.69 ± 0.560 (0.773)</b> C:86% T:82%	pCi/L	07/13/23 15:33	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.69 ± 0.831 (1.46)</b>	pCi/L	08/01/23 12:22	7440-14-4	

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: 3061146-06</b> <b>Lab ID: 30600923006</b> Collected: 06/22/23 10:40      Received: 06/30/23 09:30      Matrix: Water PWS:      Site ID:      Sample Type:						
Comments: • Sample collection time on sample containers is 1145						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0473 ± 0.359 (0.710)</b> C:NA T:74%	pCi/L	07/31/23 12:15	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.35 ± 0.517 (0.778)</b> C:85% T:74%	pCi/L	07/13/23 15:34	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.40 ± 0.876 (1.49)</b>	pCi/L	08/01/23 12:22	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

**Sample: 3061146-07** Lab ID: **30600923007** Collected: 06/23/23 10:40 Received: 06/30/23 09:30 Matrix: Water  
 PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.278 ± 0.408 (0.696)</b> C:NA T:87%	pCi/L	07/31/23 12:15	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.37 ± 0.518 (0.802)</b> C:83% T:87%	pCi/L	07/13/23 15:34	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.65 ± 0.926 (1.50)</b>	pCi/L	08/01/23 12:22	7440-14-4	

**Sample: 3061146-08** Lab ID: **30600923008** Collected: 06/24/23 13:00 Received: 06/30/23 09:30 Matrix: Water  
 PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.118 ± 0.538 (1.09)</b> C:NA T:92%	pCi/L	07/31/23 12:15	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>3.48 ± 1.44 (2.28)</b> C:84% T:83%	pCi/L	07/13/23 15:34	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>3.60 ± 1.98 (3.37)</b>	pCi/L	08/01/23 12:22	7440-14-4	

**Sample: 3061146-08 (MS)** Lab ID: **30600923009** Collected: 06/24/23 13:00 Received: 06/30/23 09:30 Matrix: Water  
 PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>84.20 %REC ± NA (NA)</b> C:NA T:NA	pCi/L	07/31/23 13:30	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>77.17 %REC ± NA (NA)</b> C:NA T:NA	pCi/L	07/13/23 15:34	15262-20-1	

**Sample: 3061146-08 (MSD)** Lab ID: **30600923010** Collected: 06/24/23 13:00 Received: 06/30/23 09:30 Matrix: Water  
 PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>61.73 %REC 30.80RPD ±</b> NA (NA) C:NA T:NA	pCi/L	07/31/23 12:15	13982-63-3	1c

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

<b>Sample: 3061146-08 (MSD)</b>		<b>Lab ID: 30600923010</b>	Collected: 06/24/23 13:00	Received: 06/30/23 09:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg							
Radium-228	EPA 904.0	<b>85.21 %REC</b>	<b>9.91RPD ± NA</b>	pCi/L	07/13/23 15:35	15262-20-1	
		<b>(NA)</b>	<b>C:NA T:NA</b>				

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

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QC Batch:	599323	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 30600923001, 30600923002, 30600923003, 30600923004, 30600923005, 30600923006, 30600923007, 30600923008, 30600923009, 30600923010

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METHOD BLANK: 2912766 Matrix: Water

Associated Lab Samples: 30600923001, 30600923002, 30600923003, 30600923004, 30600923005, 30600923006, 30600923007, 30600923008, 30600923009, 30600923010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.145 ± 0.175 (0.267) C:NA T:96%	pCi/L	07/31/23 11:59	

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: 3061146-Revised Report  
 Pace Project No.: 30600923

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QC Batch:	599328	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 30600923001, 30600923002, 30600923003, 30600923004, 30600923005, 30600923006, 30600923007, 30600923008, 30600923009, 30600923010

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METHOD BLANK: 2912783 Matrix: Water

Associated Lab Samples: 30600923001, 30600923002, 30600923003, 30600923004, 30600923005, 30600923006, 30600923007, 30600923008, 30600923009, 30600923010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.282 ± 0.287 (0.594) C:89% T:96%	pCi/L	07/13/23 15:28	

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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## QUALIFIERS

Project: 3061146-Revised Report  
Pace Project No.: 30600923

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### 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.

### ANALYTE QUALIFIERS

1c MSD recovery is low and outside of default acceptance criteria for MS recovery. Results reported based on acceptable RPD for the RQS set.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 3061146-Revised Report  
 Pace Project No.: 30600923

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30600923001	3061146-01	EPA 903.1	599323		
30600923002	3061146-02	EPA 903.1	599323		
30600923003	3061146-03	EPA 903.1	599323		
30600923004	3061146-04	EPA 903.1	599323		
30600923005	3061146-05	EPA 903.1	599323		
30600923006	3061146-06	EPA 903.1	599323		
30600923007	3061146-07	EPA 903.1	599323		
30600923008	3061146-08	EPA 903.1	599323		
30600923009	3061146-08 (MS)	EPA 903.1	599323		
30600923010	3061146-08 (MSD)	EPA 903.1	599323		
30600923001	3061146-01	EPA 904.0	599328		
30600923002	3061146-02	EPA 904.0	599328		
30600923003	3061146-03	EPA 904.0	599328		
30600923004	3061146-04	EPA 904.0	599328		
30600923005	3061146-05	EPA 904.0	599328		
30600923006	3061146-06	EPA 904.0	599328		
30600923007	3061146-07	EPA 904.0	599328		
30600923008	3061146-08	EPA 904.0	599328		
30600923009	3061146-08 (MS)	EPA 904.0	599328		
30600923010	3061146-08 (MSD)	EPA 904.0	599328		
30600923001	3061146-01	Total Radium Calculation	605501		
30600923002	3061146-02	Total Radium Calculation	605501		
30600923003	3061146-03	Total Radium Calculation	605501		
30600923004	3061146-04	Total Radium Calculation	605501		
30600923005	3061146-05	Total Radium Calculation	605501		
30600923006	3061146-06	Total Radium Calculation	605501		
30600923007	3061146-07	Total Radium Calculation	605501		
30600923008	3061146-08	Total Radium Calculation	605501		

**REPORT OF LABORATORY ANALYSIS**

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Chain of Custody



Workorder: 3061146

Workorder Name: Green Landfill Semiannual

Owner Received Date: 6/26/2023

Results Requested By: Standard

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			Radium 226	Radium 228	Radium Total	LAB USE ONLY
1												
2	3061146-01		06/22/23 10:00	IR44-McCoy	Water			X	X	X		001
3	3061146-02		06/24/23 07:50	IR44-McCoy	Water			X	X	X		002
4	3061146-03		06/23/23 10:10	IR44-McCoy	Water			X	X	X		003
5	3061146-04		06/22/23 16:30	IR44-McCoy	Water			X	X	X		004
6	3061146-05		06/22/23 12:40	IR44-McCoy	Water			X	X	X		005
7	3061146-06		06/22/23 10:40	IR44-McCoy	Water			X	X	X		006
8	3061146-07		06/23/23 10:40	IR44-McCoy	Water			X	X	X		007
9	3061146-08		06/24/23 13:00	IR44-McCoy	Water			X	X	X		008
10												

*Kayla Zachary* 6/30/23 9:30

Transfers Released By	Date/Time	Received By	Date/Time	Comments
Kayla Zachary	6/29/2023			

Cooler Temperature on Receipt 2.9 °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.

Friday, June 17, 2016 11:01:34 AM  
 Page 67 of 73

WO#: 30600923

30600923



DC#\_Title: ENV-FRM-GBUR-0088 v04\_Sample Condition Upon Receipt-  
Pittsburgh

WO#: 30600923

Effective Date: 02/03/2023

PM: SMB

Due Date: 07/24/23

Client Name: Pace - KY

CLIENT: PACE\_44\_MVKY

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking Number: 1Z067457014054 0323

Examined By	<u>PS</u>
Labeled By	<u>PS</u>
Temped By	<u>PS 6/30/23</u>

Custody Seal on Cooler/Box Present:  Yes  No    Seals Intact:  Yes  No

Thermometer Used: 16    Type of Ice: Wet Blue None

Cooler Temperature: Observed Temp 2.9 °C    Correction Factor: 0 °C    Final Temp: 2.9 °C

Temp should be above freezing to 6°C

Comments:

pH paper Lot# 10D3121    D.P.D. Residual Chlorine Lot #           

	Yes	No	NA	
Chain of Custody Present	/			1.
Chain of Custody Filled Out: -Were client corrections present on COC	/			2.
Chain of Custody Relinquished	/			3.
Sampler Name & Signature on COC:		/		4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>		/		5.
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 samples field filtered:			/	13.
Organic Samples checked for dechlorination			/	14.
Filtered volume received for dissolved tests:			/	15.
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	/			16.
All containers meet method preservation requirements:	/			Initial when completed <u>PS</u> Date/Time of Preservation
8260C/D: Headspace in VOA Vials (> 6mm)			/	17.
624.1: Headspace in VOA Vials (0mm)			/	18.
Trip Blank Present:			/	Trip blank custody seal present? YES or NO
Rad Samples Screened <0.5 mrem/hr.	/			Initial when completed <u>PS</u> Date: <u>6/30/23</u> Survey Meter SN: <u>1563</u>

sample cob time on bottles = 11:45 (all 3)

pH = 7

Comments:

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky  
3061146

WO#: 30600923

PM: SMB Due Date: 07/24/23  
CLIENT: PACE\_44\_MVKY

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
<b>Sample ID: 3061146-01</b>	<b>Water</b>	<b>Sampled:06/22/2023 10:00</b>	<b>Specific Method</b>
Radium 228 (sub)	12/19/2023 10:00	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/19/2023 10:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/19/2023 10:00	EPA 903.1	
<b>Sample ID: 3061146-02</b>	<b>Water</b>	<b>Sampled:06/24/2023 07:50</b>	<b>Specific Method</b>
Radium 226 (sub)	12/21/2023 07:50	EPA 903.1	
Radium 228 (sub)	12/21/2023 07:50	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/21/2023 07:50	EPA 904.0 Radium Sum C	
<b>Sample ID: 3061146-03</b>	<b>Water</b>	<b>Sampled:06/23/2023 10:10</b>	<b>Specific Method</b>
Radium 226 (sub)	12/20/2023 10:10	EPA 903.1	
Radium 228 (sub)	12/20/2023 10:10	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/20/2023 10:10	EPA 904.0 Radium Sum C	
<b>Sample ID: 3061146-04</b>	<b>Water</b>	<b>Sampled:06/22/2023 16:30</b>	<b>Specific Method</b>
Radium Total (sub)	12/19/2023 16:30	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/19/2023 16:30	EPA 903.1	
Radium 228 (sub)	12/19/2023 16:30	EPA 904.0 Radium Sum C	
<b>Sample ID: 3061146-05</b>	<b>Water</b>	<b>Sampled:06/22/2023 12:40</b>	<b>Specific Method</b>
Radium 228 (sub)	12/19/2023 12:40	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/19/2023 12:40	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/19/2023 12:40	EPA 903.1	

Released By	Date	Received By	Date
Released By	Date	Received By	Date



**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3061146**

Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 3061146-06</b>	<b>Water</b>	<b>Sampled:06/22/2023 10:40</b>	<b>Specific Method</b>
Radium 226 (sub)	12/19/2023 10:40	EPA 903.1	
Radium 228 (sub)	12/19/2023 10:40	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/19/2023 10:40	EPA 904.0 Radium Sum C	
<b>Sample ID: 3061146-07</b>	<b>Water</b>	<b>Sampled:06/23/2023 10:40</b>	<b>Specific Method</b>
Radium 226 (sub)	12/20/2023 10:40	EPA 903.1	
Radium 228 (sub)	12/20/2023 10:40	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/20/2023 10:40	EPA 904.0 Radium Sum C	
<b>Sample ID: 3061146-08</b>	<b>Water</b>	<b>Sampled:06/24/2023 13:00</b>	<b>Specific Method</b>
Radium Total (sub)	12/21/2023 13:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/21/2023 13:00	EPA 903.1	
Radium 228 (sub)	12/21/2023 13:00	EPA 904.0 Radium Sum C	

**WO# : 30600923**

PM: SMB      Due Date: 07/24/23  
 CLIENT: PACE\_44\_MVKY

Released By	Date	Received By	Date
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Released By	Date	Received By	Date
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Client Profile Number 11851

Site 3061146 Page 1 of 1

Sample Line Item	Amber Glass					Plastic					Vials					Other											
	AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WGFU	WGKU	ZPLC	GCUB	GJN	12GN	GN	BG1U	
001																											
002																											
003																											
004																											
005																											
006																											
007																											
008																											

Container Codes

Glass	
GJN	1 Gallon Jug with HNO3
AG5U	100mL amber glass unpreserved
AG5T	100mL amber glass Na Thiosulfate
GJN	1 Gallon Jug
AG1S	1L amber glass H2SO4
AG1H	1L amber glass HCl
AG1T	1L amber glass NA Thiosulfate
BP1U	1L clear glass unpreserved
BP3S	250mL amber glass H2SO4
BP3U	250mL amber glass un

NO#: 30600923

PM: SMB Due Date: 07/24/23  
 CLIENT: PACE\_44\_MVKY

Qualtrax ID: 55678

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 Volatile Solid
I	Wipe/Swab
ZPLC	Sploc Bag

WT	Water
SL	Solid
CL	Non-Aq Liquid
WP	Wipe

# Quality Control Sample Performance Assessment

**Analyst Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-226  
Analyst: MAR1  
Date: 7/6/2023  
Batch ID: 74125  
Matrix: DW



Method Blank Assessment	
MB Sample ID	2912766
MB Concentration:	0.145
MB Counting Uncertainty:	0.174
MB MDC:	0.267
MB Numerical Performance Indicator:	1.63
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

	LCS/IV or N?		N
	LCS/IV	N	
Count Date:	7/31/2023	LCS/IV	74125
Spike I.D.:	21-031		
Spike Concentration (pCi/mL):	39.871		
Volume Used (mL):	0.10		
Aliquot Volume (L, g, F):	0.802		
Target Conc. (pCi/L, g, F):	4.975		
Uncertainty (Calculated):	0.234		
Result (pCi/L, g, F):	5.435		
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.026		
Numerical Performance Indicator:	0.86		
Status vs Numerical Indicator:	109.26%		
Percent Recovery:	N/A		
Status vs Recovery:	Pass		
Upper % Recovery Limits:	133%		
Lower % Recovery Limits:	73%		

Duplicate Sample Assessment	
Sample I.D.:	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.:	
Sample Result (pCi/L, g, F):	
Sample Duplicate Result (pCi/L, g, F):	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	
Are sample and/or duplicate results below RL?	See Below ##
Duplicate Numerical Performance Indicator:	
Duplicate RPD:	
Duplicate Status vs Numerical Indicator:	
Duplicate Status vs RPD:	
% RPD Limit:	

## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

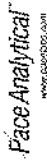
Comments:

*MSD low nanated - results reported based on acceptable*  
*Just 1/27*  
*RPD for RAS set*

Sample Matrix Spike Control Assessment		MS/MSD 1	MS/MSD 2
Sample Collection Date:	Sample I.D.:	6/24/2023	
Spike Volume Used in MSD (mL):	Sample MS I.D.:	30600923008	
MS Aliquot (L, g, F):	Sample MSD I.D.:	30600923008	
MSD Aliquot (L, g, F):	Spike I.D.:	21-031	
MS Target Conc. (pCi/L, g, F):	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	39.873	
MS Numerical Performance Indicator:	Spike Volume Used in MSD (mL):	0.20	
MSD Numerical Performance Indicator:	MS Aliquot (L, g, F):	0.253	
MS Percent Recovery:	MS Target Conc. (pCi/L, g, F):	31.565	
MS Status vs Numerical Indicator:	MSD Aliquot (L, g, F):	0.252	
MS Status vs Recovery:	MS Target Conc. (pCi/L, g, F):	31.699	
MS/MSD Upper % Recovery Limits:	MS Spike Uncertainty (calculated):	1.484	
MS/MSD Lower % Recovery Limits:	MSD Spike Uncertainty (calculated):	1.490	
	Sample Result:	0.118	
	Sample Matrix Spike Result:	0.517	
	Sample Matrix Spike Counting Uncertainty (pCi/L, g, F):	26.696	
	Sample Matrix Spike Duplicate Result:	3.472	
	Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):	19.685	
	MS Numerical Performance Indicator:	2.916	
	MSD Numerical Performance Indicator:	-7.172	
	MS Percent Recovery:	84.20%	
	MSD Percent Recovery:	81.73%	
	MS Status vs Numerical Indicator:	N/A	
	MS Status vs Recovery:	N/A	
	MS/MSD Upper % Recovery Limits:	Pass	
	MS/MSD Lower % Recovery Limits:	MSD Low	
		136%	
		71%	

Matrix Spiker/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	Sample I.D.:
Sample MS I.D.:	Sample MS I.D.:
Sample Matrix Spike Result:	Sample Matrix Spike Result:
Sample Matrix Spike Duplicate Result:	Sample Matrix Spike Duplicate Result:
Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):
Duplicate Numerical Performance Indicator:	Duplicate Numerical Performance Indicator:
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:	(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs Numerical Indicator:
MS/MSD Duplicate Status vs RPD:	MS/MSD Duplicate Status vs RPD:
% RPD Limit:	% RPD Limit:

# Quality Control Sample Performance Assessment



*Analyst Must Manually Enter All Fields Highlighted in Yellow.*

Test: Ra-228  
Analyst: JJS1  
Date: 7/10/2023  
Worklist: 74126  
Matrix: WT

MB Sample ID	2912763
MB concentration:	0.282
M/B 2 Sigma CSU:	0.287
MB MDC:	0.584
MB Numerical Performance Indicator:	1.92
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment		LCSD (Y or N)?	N
Count Date:	7/13/2023	LCSD74126	LCSD74126
Decay Corrected Spike Concentration (pCi/mL):	31.943		
Volume Used (mL):	0.10		
Aliquot Volume (L, g, F):	0.802		
Target Conc. (pCi/L, g, F):	3.985		
Uncertainty (Calculated):	0.195		
Result (pCi/L, g, F):	4.859		
LCSD/LCSD 2 Sigma CSU (pCi/L, g, F):	1.080		
Numerical Performance Indicator:	1.56		
Percent Recovery:	121.91%		
Status vs Numerical Indicator:	N/A		
Status vs Recovery:	Pass		
Upper % Recovery Limits:	135%		
Lower % Recovery Limits:	60%		

Duplicate Sample Assessment		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:		
Duplicate Sample I.D.:		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?		
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MIDC.

Comments:

*[Handwritten signature]*

*(7/17/23)*

Sample Matrix Spike Control Assessment		MS/MSD 1	MS/MSD 2
Sample Collection Date:		8/24/2023	
Sample I.D.:		30600923008	
Sample MS I.D.:		30600923009	
Sample MSD I.D.:		30600923010	
Spike I.D.:		22-040	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		32.145	
Spike Volume Used in MS (mL):		6.20	
Spike Volume Used in MSD (mL):		0.20	
MS Aliquot (L, g, F):		0.253	
MS Target Conc. (pCi/L, g, F):		25.448	
MSD Aliquot (L, g, F):		0.252	
MSD Target Conc. (pCi/L, g, F):		25.656	
MS Spike Uncertainty (calculated):		1.247	
MSD Spike Uncertainty (calculated):		1.252	
Sample Result 2 Sigma CSU (pCi/L, g, F):		3.477	
Sample Matrix Spike Result:		1.440	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		23.114	
Sample Matrix Spike Duplicate Result:		4.781	
MS Numerical Performance Indicator:		25.253	
MSD Numerical Performance Indicator:		5.146	
MS Percent Recovery:		-1.350	
MSD Percent Recovery:		77.17%	
MS Status vs Numerical Indicator:		86.21%	
MSD Status vs Numerical Indicator:		Warning	
MS Status vs Recovery:		Pass	
MSD Status vs Recovery:		Pass	
MS/MSD Upper % Recovery Limits:		135%	
MS/MSD Lower % Recovery Limits:		60%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	30600923008
Sample MS I.D.:	30600923009
Sample MSD I.D.:	30600923010
Sample Matrix Spike Result:	23.114
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	4.781
Sample Matrix Spike Duplicate Result:	25.253
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	5.146
Duplicate Numerical Performance Indicator:	-0.597
Percent Recoveries (MS/MSD Duplicate RPD):	9.91%
MS/MSD Duplicate Status vs Numerical Indicator:	Pass
MS/MSD Duplicate Status vs RPD:	Pass
% RPD Limit:	36%



## Certificate of Analysis 3061147

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 10/12/2023 15:33

Project Name: Green Landfill Semiannual Well MW104

Workorder: 3061147

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 06/23/2023 12:18.

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.*





### SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3061147-01	MW-104/	Groundwater	06/23/2023 08:50	06/23/2023 12:18	Greg Dick
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
3061147-01	Field Conductance				8390
	Field pH				6.54
	Field Temp (C)				16.34

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 8/1/2023@1634. Additional QC Data has been added to report.



**ANALYTICAL RESULTS**

Lab Sample ID: **3061147-01**  
 Description: **MW-104**

Sample Collection Date Time: 06/23/2023 08:50  
 Sample Received Date Time: 06/23/2023 12:18

**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	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Arsenic</b>	<b>0.0011</b>		mg/L	0.0010	0.0004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Boron</b>	<b>0.26</b>		mg/L	0.10	0.10	SW846 6010 B	06/27/2023 10:46	06/27/2023 19:03	MRWD
<b>Cadmium</b>	<b>0.0003</b>	J	mg/L	0.0010	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Calcium</b>	<b>477</b>	D1	mg/L	40.0	13.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 19:10	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Cobalt</b>	<b>0.004</b>		mg/L	0.004	0.004	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Iron</b>	<b>0.380</b>		mg/L	0.100	0.050	SW846 6010 B	06/27/2023 10:46	06/27/2023 19:03	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB
<b>Sodium</b>	<b>754</b>	D1	mg/L	26.0	10.0	SW846 6010 B	06/27/2023 10:46	06/27/2023 19:10	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	06/27/2023 10:46	06/29/2023 18:38	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>67</b>		mg/L	13	8	HACH 8000	06/28/2023 17:10	06/28/2023 17:10	DJK
<b>pH (Lab)</b>	<b>7.77</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	06/26/2023 15:57	06/27/2023 16:23	AED
<b>Total Dissolved Solids</b>	<b>7990</b>		mg/L	25	25	2540 C-2015	06/30/2023 16:45	07/03/2023 16:45	HAG
<b>Total Organic Carbon</b>	<b>0.9</b>		mg/L	0.5	0.4	5310 C-2014	06/28/2023 09:14	06/29/2023 00:24	DJK

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.264</b>	_Sub	pCi/L			EPA 903.1	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>0.533</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>Radium</b>	<b>0.797</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW
<b>See Attached Subcontract Report</b>	<b>0.797</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	08/01/2023 16:15	08/01/2023 16:16	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>3000</b>	D	mg/L	25.0	18.0	SW846 9056	07/02/2023 21:06	07/02/2023 21:06	CSC
Fluoride	ND	u	mg/L	0.2	0.2	SW846 9056	07/02/2023 20:39	07/02/2023 20:39	CSC
<b>Sulfate</b>	<b>4010</b>	D	mg/L	50	25	SW846 9056	07/02/2023 21:06	07/02/2023 21:06	CSC



**Notes for work order 3061147**

- 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.
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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.
- M7 Matrix spike recovery was low.
- 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/Acronyms**

- 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



**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
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**Batch BCF2432 - EPA 200.2**

**Blank (BCF2432-BLK1)**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 17:10

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	ND	0.100	mg/L							U
Sodium	ND	0.26	mg/L							U

**Blank (BCF2432-BLK2)**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:03

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
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**LCS (BCF2432-BS1)**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 17:13

Boron	0.12	0.10	mg/L	0.125		97.4	85-115			
Calcium	6.09	0.40	mg/L	6.25		97.4	85-115			
Iron	6.15	0.100	mg/L	6.25		98.4	85-115			
Sodium	5.68	0.26	mg/L	6.25		90.8	85-115			

**LCS (BCF2432-BS2)**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:06

Mercury	0.0026	0.0005	mg/L	0.00250		103	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		104	85-115			
Antimony	0.065	0.005	mg/L	0.0625		104	85-115			
Arsenic	0.0604	0.0010	mg/L	0.0625		96.7	85-115			
Barium	0.062	0.004	mg/L	0.0625		98.6	85-115			
Beryllium	0.0599	0.0020	mg/L	0.0625		95.8	85-115			
Cadmium	0.0597	0.0010	mg/L	0.0625		95.5	85-115			
Chromium	0.0616	0.0020	mg/L	0.0625		98.6	85-115			
Cobalt	0.061	0.004	mg/L	0.0625		98.2	85-115			
Copper	0.062	0.003	mg/L	0.0625		98.8	85-115			
Lead	0.062	0.002	mg/L	0.0625		99.8	85-115			
Lithium	0.06	0.02	mg/L	0.0625		94.9	85-115			
Selenium	0.058	0.003	mg/L	0.0625		92.2	85-115			
Thallium	0.0619	0.0020	mg/L	0.0625		99.0	85-115			



**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
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**Batch BCF2432 - EPA 200.2**

**Matrix Spike (BCF2432-MS1) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:22

Boron	1.84	1.00	mg/L	0.125	1.92	NR	80-120			D2, M2
Calcium	34.2	4.00	mg/L	6.25	28.6	89.4	80-120			D2
Iron	6.35	1.00	mg/L	6.25	ND	102	80-120			D2
Sodium	190	2.60	mg/L	6.25	199	NR	80-120			D2, M3

**Matrix Spike (BCF2432-MS2) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:40

Antimony	0.065	0.005	mg/L	0.0625	ND	105	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	94.3	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Arsenic	0.0632	0.0010	mg/L	0.0625	0.0005	100	80-120			
Barium	0.137	0.004	mg/L	0.0625	0.071	105	80-120			
Beryllium	0.0607	0.0020	mg/L	0.0625	ND	97.1	80-120			
Cadmium	0.0601	0.0010	mg/L	0.0625	ND	96.2	80-120			
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120			
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.6	80-120			
Copper	0.060	0.003	mg/L	0.0625	ND	96.7	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	96.0	80-120			
Lithium	0.08	0.02	mg/L	0.0625	0.03	91.7	80-120			
Selenium	0.058	0.003	mg/L	0.0625	ND	92.7	80-120			
Thallium	0.0601	0.0020	mg/L	0.0625	ND	96.1	80-120			

**Matrix Spike Dup (BCF2432-MSD1) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:25

Boron	1.91	1.00	mg/L	0.125	1.92	NR	80-120	3.55	20	D2, M2
Calcium	33.4	4.00	mg/L	6.25	28.6	76.3	80-120	2.42	20	D2, M2
Iron	6.09	1.00	mg/L	6.25	ND	97.4	80-120	4.28	20	D2
Sodium	187	2.60	mg/L	6.25	199	NR	80-120	1.94	20	D2, M3

**Matrix Spike Dup (BCF2432-MSD2) Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:42

Antimony	0.062	0.005	mg/L	0.0625	ND	99.3	80-120	5.36	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	80-120	4.48	20	
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.7	80-120	1.71	20	
Arsenic	0.0606	0.0010	mg/L	0.0625	0.0005	96.1	80-120	4.23	20	
Barium	0.133	0.004	mg/L	0.0625	0.071	99.5	80-120	2.77	20	
Beryllium	0.0554	0.0020	mg/L	0.0625	ND	88.6	80-120	9.18	20	
Cadmium	0.0569	0.0010	mg/L	0.0625	ND	91.0	80-120	5.50	20	
Chromium	0.0593	0.0020	mg/L	0.0625	ND	95.0	80-120	4.50	20	
Cobalt	0.058	0.004	mg/L	0.0625	ND	93.0	80-120	4.80	20	
Copper	0.057	0.003	mg/L	0.0625	ND	91.9	80-120	5.05	20	
Lead	0.057	0.002	mg/L	0.0625	ND	91.1	80-120	5.22	20	
Lithium	0.08	0.02	mg/L	0.0625	0.03	84.8	80-120	5.26	20	
Selenium	0.056	0.003	mg/L	0.0625	ND	89.6	80-120	3.44	20	
Thallium	0.0564	0.0020	mg/L	0.0625	ND	90.3	80-120	6.25	20	





**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
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**Batch BCF2432 - EPA 200.2**

**Post Spike (BCF2432-PS1)**

**Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/27/2023 19:29

Boron	2.08	1.00	mg/L	0.125	1.92	131	75-125			D2, M1
Calcium	37.2	4.00	mg/L	6.25	28.6	137	75-125			D2, M1
Iron	6.80	1.00	mg/L	6.25	ND	109	75-125			D2
Sodium	208	2.60	mg/L	6.25	199	137	75-125			D2, M3

**Post Spike (BCF2432-PS2)**

**Source: 3061146-01**

Prepared: 6/27/2023 10:46, Analyzed: 6/29/2023 18:45

Antimony	0.064	0.005	mg/L	0.0625	ND	102	75-125			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	75-125			
Mercury	0.0025	0.0005	mg/L	0.00250	ND	98.4	75-125			
Arsenic	0.0620	0.0010	mg/L	0.0625	0.0005	98.4	75-125			
Barium	0.135	0.004	mg/L	0.0625	0.071	102	75-125			
Beryllium	0.0572	0.0020	mg/L	0.0625	ND	91.6	75-125			
Cadmium	0.0593	0.0010	mg/L	0.0625	ND	94.9	75-125			
Chromium	0.0605	0.0020	mg/L	0.0625	ND	96.8	75-125			
Cobalt	0.059	0.004	mg/L	0.0625	ND	95.0	75-125			
Copper	0.059	0.003	mg/L	0.0625	ND	94.0	75-125			
Lead	0.058	0.002	mg/L	0.0625	ND	92.1	75-115			
Lithium	0.08	0.02	mg/L	0.0625	0.03	85.7	75-125			
Selenium	0.057	0.003	mg/L	0.0625	ND	91.3	75-125			
Thallium	0.0573	0.0020	mg/L	0.0625	ND	91.6	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCF2393 - Default Prep Micro</b>										
<b>LCS (BCF2393-BS1)</b>										
Prepared: 6/26/2023 15:57, Analyzed: 6/27/2023 16:23										
pH (Lab)	5.07		Std. Units	5.00		101	98.8-101.2			
<b>Duplicate (BCF2393-DUP1) Source: 3061147-01</b>										
Prepared: 6/26/2023 15:57, Analyzed: 6/27/2023 16:23										
pH (Lab)	7.78	0.10	Std. Units		7.77			0.129	10	H3
<b>Batch BCF2499 - Default Prep Wet Chem</b>										
<b>Blank (BCF2499-BLK1)</b>										
Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10										
Chemical Oxygen Demand	ND	13	mg/L							U
<b>LCS (BCF2499-BS1)</b>										
Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10										
Chemical Oxygen Demand	123	13	mg/L	125		98.4	90-110			
<b>Duplicate (BCF2499-DUP1) Source: 3061147-01</b>										
Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10										
Chemical Oxygen Demand	69	13	mg/L		67			2.94	25	
<b>Matrix Spike (BCF2499-MS1) Source: 3061147-01</b>										
Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10										
Chemical Oxygen Demand	312	13	mg/L	250	67	98.0	90-110			
<b>Matrix Spike Dup (BCF2499-MSD1) Source: 3061147-01</b>										
Prepared: 6/28/2023 17:10, Analyzed: 6/28/2023 17:10										
Chemical Oxygen Demand	314	13	mg/L	250	67	98.8	90-110	0.639	10	
<b>Batch BCF2535 - Default Prep Wet Chem</b>										
<b>Blank (BCF2535-BLK1)</b>										
Prepared: 6/28/2023 9:14, Analyzed: 6/28/2023 20:28										
Total Organic Carbon	ND	0.5	mg/L							U



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCF2535 - Default Prep Wet Chem

LCS (BCF2535-BS1)

Prepared: 6/28/2023 9:14, Analyzed: 6/28/2023 20:49

Total Organic Carbon	4.8	0.5	mg/L	5.00		96.2	80-120			
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Duplicate (BCF2535-DUP1) Source: 3061146-05

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 16:31

Total Organic Carbon	0.7	0.5	mg/L		0.7			4.03	25	
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Duplicate (BCF2535-DUP2) Source: 3063918-02

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 20:57

Total Organic Carbon	1.4	0.5	mg/L		1.6			11.3	25	
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Matrix Spike (BCF2535-MS1) Source: 3061146-05

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 16:53

Total Organic Carbon	2.5	0.5	mg/L	2.50	0.7	72.8	80-120			M7
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Matrix Spike (BCF2535-MS2) Source: 3063918-02

Prepared: 6/28/2023 9:14, Analyzed: 7/5/2023 21:19

Total Organic Carbon	6.0	0.5	mg/L	5.00	1.6	87.9	80-120			
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Batch BCF2540 - Default Prep Wet Chem

Blank (BCF2540-BLK1)

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCF2540-BS1)

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	1500	25	mg/L	1500		99.9	80-120			
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Duplicate (BCF2540-DUP1) Source: 3061146-01

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	508	100	mg/L		520			2.33	10	
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Duplicate (BCF2540-DUP2) Source: 3064088-01

Prepared: 6/28/2023 13:05, Analyzed: 6/28/2023 13:05

Total Dissolved Solids	304	50	mg/L		298			1.99	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
<b>Batch BCF2838 - Default Prep Wet Chem</b>										
<b>Blank (BCF2838-BLK1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCF2838-BS1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1490	25	mg/L	1500		99.4	80-120			
<b>Duplicate (BCF2838-DUP1) Source: 3032610-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1040	100	mg/L		1070			3.03	10	
<b>Duplicate (BCF2838-DUP2) Source: 3063392-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	7800	100	mg/L		7780			0.205	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0012 - Default Prep IC**

**Blank (BCG0012-BLK1)**

Prepared: 7/2/2023 17:28, Analyzed: 7/2/2023 17:28

Fluoride	ND	0.2	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1	mg/L							U

**LCS (BCG0012-BS1)**

Prepared: 7/2/2023 17:00, Analyzed: 7/2/2023 17:00

Fluoride	5.3		mg/L	5.00		105	90-110			
Chloride	12.3		mg/L	12.5		98.1	90-110			
Sulfate	24		mg/L	25.0		97.7	90-110			

**Matrix Spike (BCG0012-MS1) Source: 3063664-02**

Prepared: 7/3/2023 2:08, Analyzed: 7/3/2023 2:08

Fluoride	59.1		mg/L	50.0	1.0	116	75-125			D2
Chloride	134		mg/L	125	2.6	105	75-125			D2
Sulfate	550		mg/L	250	291	103	75-125			D2

**Matrix Spike Dup (BCG0012-MSD1) Source: 3063664-02**

Prepared: 7/3/2023 2:35, Analyzed: 7/3/2023 2:35

Fluoride	66.8		mg/L	50.0	1.0	132	75-125	12.2	15	D2, M1
Chloride	149		mg/L	125	2.6	117	75-125	10.5	15	D2
Sulfate	572		mg/L	250	291	112	75-125	4.01	15	D2

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>5310 C-2014 in Water</b>	
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 MS Drinking Water MADV
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)





**Sample Acceptance Checklist for Work Order 3061147**

Shipped By: Client

Temperature: 5.10° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Well MW104**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061147-01 A	<u>06/23/23</u>	<u>0850</u>	Plastic 500mL pH<2 w/HNO3	1	MW-104	g / c	Thallium Tot 6020 Antimony Tot 6020 Beryllium Tot 6020 Barium Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Iron Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 B	<u>06/23/23</u>	<u>0850</u>	Plastic 1L	1	MW-104	g / c	Chloride 9056 Fluoride 9056 pH (Lab) Sulfate 9056 TDS
3061147-01 C	<u>06/23/23</u>	<u>0850</u>	Plastic 500mL pH<2 w/H2SO4	1	MW-104	g / c	COD TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 D	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-104	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 E	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Thermometer Serial Number

181390287  
181460057  
Temp 51 °C

Preservation Check Performed by: KED

Field data collected by: Greg Dick Date (mm/dd/yy) 06/23/23 Time (24 hr) 0850  
pH 6.54 Cond (umho) 8390 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.54 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)

Greg Dick

Received by: (Signature)

KED

Date (mm/dd/yy)

06/26/23

Time (24 hr)

0218

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Well MW104**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 06/05/23 Start time 0850 End Date N/A End Time 0850 Temp (oC) 18  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061147-01 F	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3061147-01 G	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-104	g / c	Radium Total (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3061147-01 H	<u>06/23/23</u>	<u>0850</u>	AG 250mL pH<2 w/H2SO4	1	MW-104	g / c	TOC
				Preservation Check: pH: <input checked="" type="checkbox"/>			

Preservation Check Performed by: KEO

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) _____	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1218</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
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Greg Dick  
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Henderson, KY 42419

**Invoice To:**  
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PO Box 24  
Henderson, KY 42419

**Project: Green Landfill Semiannual Well MW104**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
3061147	(mm/dd/yy):	Time (24 hr):					
3061147-01 A	<u>06/23/23</u>	<u>0850</u>	Plastic 500mL pH<2 w/HNO3	1	MW-104	g / c	Thallium Tot 6020 Antimony Tot 6020 Beryllium Tot 6020 Barium Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Iron Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 B	<u>06/23/23</u>	<u>0850</u>	Plastic 1L	1	MW-104	g / c	Chloride 9056 Fluoride 9056 pH (Lab) Sulfate 9056 TDS
3061147-01 C	<u>06/23/23</u>	<u>0850</u>	Plastic 500mL pH<2 w/H2SO4	1	MW-104	g / c	COD TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 D	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-104	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 E	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Thermometer Serial Number  
181390287  
181460057  
Temp 5.1 °C

Preservation Check Performed by: KED

Field data collected by: Greg Dick Date (mm/dd/yy) 06/23/23 Time (24 hr) 0850  
pH 6.54 Cond (umho) 8390 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 16.54 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 0218

# Chain of Custody

Scheduled for: **06/05/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project:** Green Landfill Semiannual Well MW104

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 06/05/23 Start time 0850 End Date N/A End Time N/A Temp (oC) N/A  
Effluent: Start Date 06/05/23 Start time 0850 End Date N/A End Time N/A Temp (oC) N/A

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	*required information* Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061147-01 F	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 G	<u>06/23/23</u>	<u>0850</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-104	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061147-01 H	<u>06/23/23</u>	<u>0850</u>	AG 250mL pH<2 w/H2SO4	1	MW-104	g / c	TOC
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: VED

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) _____	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1218</u>
_____	_____	_____	_____
_____	_____	_____	_____





October 11, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3061147-Revised Report  
Pace Project No.: 30600869

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on June 30, 2023. 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

(Greensburg, PA) - Revision 1 - This report replaces the August 1, 2023 report. This project was revised on October 11, 2023 to include QC sheets.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 3061147-Revised Report  
 Pace Project No.: 30600869

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### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

---

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3061147-Revised Report  
Pace Project No.: 30600869

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
30600869001	3061147-01	Water	06/23/23 08:50	06/30/23 09:30

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### SAMPLE ANALYTE COUNT

Project: 3061147-Revised Report  
Pace Project No.: 30600869

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30600869001	3061147-01	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3061147-Revised Report  
 Pace Project No.: 30600869

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.264 ± 0.367 (0.620)</b> <b>C:NA T:81%</b>	pCi/L	07/31/23 11:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.533 ± 0.423 (0.846)</b> <b>C:85% T:81%</b>	pCi/L	07/13/23 15:32	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.797 ± 0.790 (1.47)</b>	pCi/L	08/01/23 12:22	7440-14-4	

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3061147-Revised Report  
 Pace Project No.: 30600869

QC Batch: 599323	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30600869001

METHOD BLANK: 2912766 Matrix: Water

Associated Lab Samples: 30600869001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.145 ± 0.175 (0.267) C:NA T:96%	pCi/L	07/31/23 11:59	

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: 3061147-Revised Report  
 Pace Project No.: 30600869

QC Batch: 599328	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30600869001

METHOD BLANK: 2912783 Matrix: Water  
 Associated Lab Samples: 30600869001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.282 ± 0.287 (0.594) C:89% T:96%	pCi/L	07/13/23 15:28	

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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## QUALIFIERS

Project: 3061147-Revised Report  
Pace Project No.: 30600869

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### 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.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 3061147-Revised Report  
Pace Project No.: 30600869

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30600869001	3061147-01	EPA 903.1	599323		
30600869001	3061147-01	EPA 904.0	599328		
30600869001	3061147-01	Total Radium Calculation	605501		

### REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 3061147

Workorder Name: Green Landfill Semiannual Owner Received Date: 6/23/2023

Results Requested By: Standard

Report 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 Pf  
 1638 Rosey Town Rd Suite 2,3,4  
 Greensburg, PA 15601  
 (724) 850-5615

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Date/Time	Received By	Date/Time	Comments	LAB USE ONLY		
1																	
2	3061147-01		06/23/23 08:50	IR44-McCoy	Water									X	X	Radium 226	
3														X	X	Radium 228	
4																Radium Total	
5																	
6																	
7																	
8																	
9																	
10																	
Transfers Released By																	
1		Kayla Zachary				6/29/2023											
2																	
3																	

Cooler Temperature on Receipt 2.1 °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.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002rev.00 24March2009

Page 1 of 1

WO#: 30600869





**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3061147**

**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
<b>Sample ID: 3061147-01</b>	<b>Water</b>	<b>Sampled:06/23/2023 08:50</b>	<b>Specific Method</b>
Radium Total (sub)	12/20/2023 08:50	EPA 904.0 Radium Sum C	
Radium 228 (sub)	12/20/2023 08:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/20/2023 08:50	EPA 903.1	

**WO# : 30600869**  
 PM: SMB      Due Date: 07/24/23  
 CLIENT: PACE\_44\_MVKY

Released By	Date	Received By	Date



DC#\_Title: ENV-FRM-GBUR-0088 v04\_Sample Condition Upon Receipt-  
Pittsburgh

WO#: 30600869

Effective Date: 02/03/2023

PM: SMB

Due Date: 07/24/23

CLIENT: PACE\_44\_MVKY

Client Name: Pace Madisonville

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking Number: 1Z067Y570140620714

Examined By	TH
Labeled By	TH
Temped By	TH

Custody Seal on Cooler/Box Present:  Yes  No      Seals Intact:  Yes  No

Thermometer Used: 16      Type of Ice: Wet Blue None

Cooler Temperature: Observed Temp 2.1 °C      Correction Factor: 0 °C      Final Temp: 2.1 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot#	D.P.D. Residual Chlorine Lot #
				<u>1003121</u>	
Chain of Custody Present	<input checked="" type="checkbox"/>				
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>				
-Were client corrections present on COC		<input checked="" type="checkbox"/>			
Chain of Custody Relinquished	<input checked="" type="checkbox"/>				
Sampler Name & Signature on COC:		<input checked="" type="checkbox"/>			
Sample Labels match COC:	<input checked="" type="checkbox"/>				
-Includes date/time/ID					
Matrix:					
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>				
Short Hold Time Analysis (<72hr remaining):		<input checked="" type="checkbox"/>			
Rush Turn Around Time Requested:		<input checked="" type="checkbox"/>			
Sufficient Volume:	<input checked="" type="checkbox"/>				
Correct Containers Used:	<input checked="" type="checkbox"/>				
-Pace Containers Used					
Containers Intact:	<input checked="" type="checkbox"/>				
Orthophosphate field filtered:			<input checked="" type="checkbox"/>		
Hex Cr Aqueous samples field filtered:			<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination			<input checked="" type="checkbox"/>		
Filtered volume received for dissolved tests:			<input checked="" type="checkbox"/>		
All containers checked for preservation:	<input checked="" type="checkbox"/>				
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix					
All containers meet method preservation requirements:	<input checked="" type="checkbox"/>			initial when completed <u>TH</u>	Date/Time of Preservation
				Lot# of added Preservative	
8260C/D: Headspace in VOA Vials (> 6mm)			<input checked="" type="checkbox"/>		
624.1: Headspace in VOA Vials (0mm)			<input checked="" type="checkbox"/>		
Trip Blank Present:			<input checked="" type="checkbox"/>		Trip blank custody seal present? YES or NO
Rad Samples Screened <0.5 mrem/hr.	<input checked="" type="checkbox"/>			initial when completed <u>TH</u>	Date: <u>6/30/23</u> Survey Meter SN: <u>1563</u>
Comments:					

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Client  
 Site

306.1147

Page 1 of 1

Profile Number  
 Notes

11851

Sample Line Item	Amber Glass					Plastic					Vials					Other										
	AG1H	AG3S	AG3U	AG5U	AG5T	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG8S	VG9H	VG9T	VG9U	VOAK	WGFU	WGPU	ZPLC	GCUB	GJN	12GN	GN	BG1U	
1																										

Container Codes

Glass	
GIN	1 Gallon Jug with HNO3
AG5U	100mL amber glass unpreserved
AG5T	100mL amber glass Na Thiosulfate
GJN	1 Gallon Jug
AG1S	1L amber glass H2SO4
AG1H	1L amber glass HCl
AG1T	1L amber glass NA Thiosulfate
AG2U	1L clear glass unpreserved
WGPU	250mL amber glass H2SO4
GN	250mL amber glass unpreserved
DG9S	40mL amber VOA vial H2SO4
VG9U	40mL clear VOA vial
VG9T	40mL clear VOA vial Na Thiosulfate
VG9H	40mL clear VOA vial HCl
JGFU	4oz amber wide jar
WGFU	4oz wide jar unpreserved
BG2U	500mL clear glass unpreserved
AG2U	500mL amber glass unpreserved
WGPU	8oz wide jar unpreserved
GN	General

**WO#: 30600869**

PH: SMB Due Date: 07/24/23  
 CLIENT: PACE\_44\_MVNY

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
	250mL plastic NAOH
	250mL plastic H2SO4
	50mL plastic unpreserved
	50mL plastic H2SO4
	50mL plastic unpreserved
EZI	5g Encore
VOAK	Kit Volatile Solid
I	Wipe/Swab
ZPLC	Siploc Bag
WT	Water
SL	Solid
OL	Non-Ag Liquid
WP	Wipe

# Quality Control Sample Performance Assessment

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Test: Ra-226  
Analyst: MAR1  
Date: 7/6/2023  
Batch ID: 74125  
Matrix: DW



Method Blank Assessment	
MB Sample ID	2912766
MB Concentration:	0.145
MB Counting Uncertainty:	0.174
MB MDC:	0.267
MB Numerical Performance Indicator:	1.63
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

	LCS/IV or N?	
	LCS/IV	N
Count Date:	7/31/2023	LCS/IV
Spike I.D.:	21-031	
Spike Concentration (pCi/mL):	39.871	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.802	
Target Conc. (pCi/L, g, F):	4.975	
Uncertainty (Calculated):	0.234	
Result (pCi/L, g, F):	5.435	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.026	
Numerical Performance Indicator:	0.86	
Status vs Numerical Indicator:	N/A	
Percent Recovery:	109.26%	
Upper % Recovery Limit:	133%	
Lower % Recovery Limit:	73%	

Duplicate Sample Assessment	
Sample I.D.:	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.:	
Sample Result (pCi/L, g, F):	
Sample Duplicate Result (pCi/L, g, F):	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	
Are sample and/or duplicate results below RL?	See Below ##
Duplicate Numerical Performance Indicator:	
Duplicate RPD:	
Duplicate Status vs Numerical Indicator:	
Duplicate Status vs RPD:	
% RPD Limit:	

Sample Matrix Spike Control Assessment		MS/MSD 1	MS/MSD 2
Sample Collection Date:	Sample I.D.:	6/24/2023	
Spike Volume Used in MSD (mL):	Sample MS I.D.:	30600923008	
MS Aliquot (L, g, F):	Sample MSD I.D.:	30600923008	
MS Target Conc. (pCi/L, g, F):	Spike I.D.:	21-031	
MSD Aliquot (L, g, F):	MS/MSD Decay Corrected Spike Concentration (pCi/mL):	39.873	
MS Numerical Performance Indicator:	Spike Volume Used in MSD (mL):	0.20	
MSD Numerical Performance Indicator:	MS Aliquot (L, g, F):	0.253	
MS Percent Recovery:	MS Target Conc. (pCi/L, g, F):	31.565	
MS Status vs Numerical Indicator:	MSD Aliquot (L, g, F):	0.252	
MS Status vs Recovery:	MSD Target Conc. (pCi/L, g, F):	31.699	
MS/MSD Upper % Recovery Limit:	MS Spike Uncertainty (calculated):	1.484	
MS/MSD Lower % Recovery Limit:	MSD Spike Uncertainty (calculated):	1.490	
	Sample Result:	0.118	
	Sample Matrix Spike Result:	0.517	
	Sample Matrix Spike Counting Uncertainty (pCi/L, g, F):	26.696	
	Sample Matrix Spike Duplicate Result:	3.472	
	Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):	19.685	
	MS Numerical Performance Indicator:	2.916	
	MSD Numerical Performance Indicator:	-7.172	
	MS Percent Recovery:	84.20%	
	MSD Percent Recovery:	81.73%	
	MS Status vs Numerical Indicator:	N/A	
	MS Status vs Recovery:	N/A	
	MS/MSD Upper % Recovery Limit:	Pass	
	MS/MSD Lower % Recovery Limit:	MSD Low	
		136%	
		71%	

Matrix Spiker/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	30600923008
Sample MS I.D.:	30600923008
Sample MSD I.D.:	30600923010
Sample Matrix Spike Result:	26.696
Sample Matrix Spike Duplicate Result:	3.472
Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):	19.685
Duplicate Numerical Performance Indicator:	2.916
Duplicate Numerical Performance Indicator:	3.031
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:	30.80%
MS/MSD Duplicate Status vs Numerical Indicator:	N/A
MS/MSD Duplicate Status vs RPD:	Pass
% RPD Limit:	32%

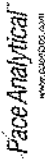
## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

*MSD low nanated - results reported based on acceptable*  
*Just 1/27*  
*RPD for RAS set*

## All other QC criteria pass, the batch is acceptable. The matrix spike result indicates a possible bias for this sample only and may not be applicable to any other samples in this analytical batch. Reprint the stamp

# Quality Control Sample Performance Assessment



*Analyst Must Manually Enter All Fields Highlighted in Yellow.*

Test: Ra-228  
Analyst: JJS1  
Date: 7/10/2023  
Worklist: 74126  
Matrix: WT

**Method Blank Assessment**

MB Sample ID: 2912763  
MB concentration: 0.282  
M/B 2 Sigma CSU: 0.287  
MB MDC: 0.584  
MB Numerical Performance Indicator: 1.92  
MB Status vs Numerical Indicator: Pass  
MB Status vs. MDC: Pass

**Laboratory Control Sample Assessment**

LCSD (Y or N)?	N
LCSD74126	LCSD74126
Count Date: 7/13/2023	
Spike ID: 22-040	
Decay Corrected Spike Concentration (pCi/mL): 31.943	
Volume Used (mL): 0.10	
Aliquot Volume (L, g, F): 0.802	
Target Conc. (pCi/L, g, F): 3.985	
Uncertainty (Calculated): 0.195	
Result (pCi/L, g, F): 4.859	
LCSD/LCSD 2 Sigma CSU (pCi/L, g, F): 1.080	
Numerical Performance Indicator: 1.56	
Percent Recovery: 121.91%	
Status vs Numerical Indicator: N/A	
Status vs Recovery: Pass	
Upper % Recovery Limits: 135%	
Lower % Recovery Limits: 60%	

**Duplicate Sample Assessment**

Sample I.D.:  
Duplicate Sample I.D.:  
Sample Result (pCi/L, g, F):  
Sample Result 2 Sigma CSU (pCi/L, g, F):  
Sample Duplicate Result (pCi/L, g, F):  
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):  
Are sample and/or duplicate results below RL?  
Duplicate Numerical Performance Indicator:  
Duplicate RPD:  
Duplicate Status vs Numerical Indicator:  
Duplicate Status vs RPD:  
% RPD Limit:

Enter Duplicate sample IDs if other than LCSD/LCSD in the space below.

See Below ##

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	8/24/2023	
Sample I.D.:	30600923008	
Sample MS I.D.:	30600923009	
Sample MSD I.D.:	30600923010	
Spike I.D.:	22-040	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.145	
Spike Volume Used in MS (mL):	6.20	
Spike Volume Used in MSD (mL):	0.20	
MS Aliquot (L, g, F):	0.253	
MS Target Conc. (pCi/L, g, F):	25.448	
MSD Aliquot (L, g, F):	0.252	
MSD Target Conc. (pCi/L, g, F):	25.656	
MS Spike Uncertainty (calculated):	1.247	
MSD Spike Uncertainty (calculated):	1.252	
Sample Result 2 Sigma CSU (pCi/L, g, F):	3.477	
Sample Matrix Spike Result:	1.440	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	23.114	
Sample Matrix Spike Duplicate Result:	4.781	
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	25.253	
MS Numerical Performance Indicator:	5.146	
MSD Numerical Performance Indicator:	-2.213	
MS Percent Recovery:	77.17%	
MSD Percent Recovery:	86.21%	
MS Status vs Numerical Indicator:	Warning	
MSD Status vs Numerical Indicator:	Pass	
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:	Pass	
MS/MSD Upper % Recovery Limits:	135%	
MS/MSD Lower % Recovery Limits:	60%	

**Matrix Spike/Matrix Spike Duplicate Sample Assessment**

Sample I.D.:	30600923008
Sample MS I.D.:	30600923009
Sample MSD I.D.:	30600923010
Sample Matrix Spike Result:	23.114
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	4.781
Sample Matrix Spike Duplicate Result:	25.253
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	5.146
Duplicate Numerical Performance Indicator:	-0.597
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:	9.91%
MS/MSD Duplicate Status vs Numerical Indicator:	Pass
MS/MSD Duplicate Status vs RPD:	Pass
% RPD Limit:	36%

## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*JJS 7/23*

*(7/17/23)*



September 18, 2023

Mr. Chris Hoglund  
Burn & McDonnell  
9450 Ward Parkway  
Kansas City, MO 64114

RE: Project: BREC Sebree Station Green CCR  
Pace Project No.: 50348165

Dear Mr. Hoglund:

Enclosed are the analytical results for sample(s) received by the laboratory on June 27, 2023. 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.

Some analyses were subcontracted outside of the Pace Network. The test report from the external subcontractor is attached to this report in its entirety.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

Revised Report: Issued to replace the report dated 7/14/23. Issued to report 6010 total Arsenic results for samples -003, -005, -007 & -009 per client request. kh091523

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kenneth Hunt  
kenneth.hunt@pacelabs.com  
(317)228-3100  
Project Manager

Enclosures



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

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### **Pace Analytical Services Indianapolis**

7726 Moller Road, Indianapolis, IN 46268

Illinois Accreditation #: 200074

Indiana Drinking Water Laboratory #: C-49-06

Kansas/TNI Certification #: E-10177

Kentucky UST Agency Interest #: 80226

Kentucky WW Laboratory ID #: 98019

Michigan Drinking Water Laboratory #9050

Ohio VAP Certified Laboratory #: CL0065

Oklahoma Laboratory #: 9204

Texas Certification #: T104704355

Wisconsin Laboratory #: 999788130

USDA Foreign Soil Permit #: 525-23-13-23119

USDA Compliance Agreement #: IN-SL-22-001

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50348165001	MW-2	Water	06/24/23 07:50	06/27/23 10:05
50348165002	MW-2 (0.20 um)	Water	06/24/23 07:50	06/27/23 10:05
50348165003	MW-105	Water	06/24/23 12:20	06/27/23 10:05
50348165004	MW-105 (0.20 um)	Water	06/24/23 12:20	06/27/23 10:05
50348165005	MW-106S	Water	06/24/23 11:30	06/27/23 10:05
50348165006	MW-106S (0.2 um)	Water	06/24/23 11:30	06/27/23 10:05
50348165007	MW-106D	Water	06/24/23 10:00	06/27/23 10:05
50348165008	MW-106D (0.2 um)	Water	06/24/23 10:00	06/27/23 10:05
50348165009	DUP	Water	06/24/23 10:30	06/27/23 10:05
50348165010	DUP (0.20 um)	Water	06/24/23 10:30	06/27/23 10:05

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### SAMPLE ANALYTE COUNT

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50348165001	MW-2	EPA 6010	JPK	1	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 3500-Fe D#4	MMS	1	PASI-I
50348165002	MW-2 (0.20 um)	EPA 6020	MGM	1	PASI-I
50348165003	MW-105	EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 3500-Fe D#4	MMS	1	PASI-I
50348165004	MW-105 (0.20 um)	EPA 6020	MGM	1	PASI-I
50348165005	MW-106S	EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
50348165006	MW-106S (0.2 um)	EPA 6020	MGM	1	PASI-I
50348165007	MW-106D	EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 3500-Fe D#4	MMS	1	PASI-I
50348165008	MW-106D (0.2 um)	EPA 6020	MGM	1	PASI-I
50348165009	DUP	EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 3500-Fe D#4	MMS	1	PASI-I
50348165010	DUP (0.20 um)	EPA 6020	MGM	1	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>50348165001</b>	<b>MW-2</b>					
EPA 6010	Iron	2580	ug/L	100	07/06/23 01:55	
EPA 6020	Arsenic, Dissolved	6.5	ug/L	1.0	07/05/23 17:51	
SM 3500-Fe D#4	Iron, Ferric	1.2	mg/L	0.20	07/12/23 15:03	N2
<b>50348165002</b>	<b>MW-2 (0.20 um)</b>					
EPA 6020	Arsenic, Dissolved	5.8	ug/L	1.0	07/05/23 18:18	
<b>50348165003</b>	<b>MW-105</b>					
EPA 6010	Arsenic	15.3	ug/L	10.0	07/06/23 02:01	
EPA 6010	Iron	38200	ug/L	100	07/06/23 02:01	
EPA 6020	Arsenic, Dissolved	14.0	ug/L	1.0	07/05/23 18:22	
SM 3500-Fe D#4	Iron, Ferric	34.9	mg/L	0.20	07/12/23 15:03	N2
<b>50348165004</b>	<b>MW-105 (0.20 um)</b>					
EPA 6020	Arsenic, Dissolved	13.8	ug/L	1.0	07/05/23 18:26	
<b>50348165005</b>	<b>MW-106S</b>					
EPA 6010	Arsenic	60.7	ug/L	10.0	07/06/23 02:03	
EPA 6010	Iron	9180	ug/L	100	07/06/23 02:03	
EPA 6020	Arsenic, Dissolved	55.6	ug/L	1.0	07/05/23 18:38	
<b>50348165006</b>	<b>MW-106S (0.2 um)</b>					
EPA 6020	Arsenic, Dissolved	59.2	ug/L	1.0	07/05/23 18:42	
<b>50348165007</b>	<b>MW-106D</b>					
EPA 6010	Iron	444	ug/L	100	07/06/23 02:05	
EPA 6020	Arsenic, Dissolved	1.1	ug/L	1.0	07/05/23 18:46	
<b>50348165008</b>	<b>MW-106D (0.2 um)</b>					
EPA 6020	Arsenic, Dissolved	1.1	ug/L	1.0	07/05/23 18:58	
<b>50348165009</b>	<b>DUP</b>					
EPA 6010	Iron	446	ug/L	100	07/06/23 02:07	
EPA 6020	Arsenic, Dissolved	1.2	ug/L	1.0	07/05/23 19:02	
<b>50348165010</b>	<b>DUP (0.20 um)</b>					
EPA 6020	Arsenic, Dissolved	1.3	ug/L	1.0	07/05/23 19:06	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-2		Lab ID: 50348165001		Collected: 06/24/23 07:50	Received: 06/27/23 10:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>		Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Indianapolis						
Iron	<b>2580</b>	ug/L	100	1	06/29/23 09:03	07/06/23 01:55	7439-89-6	
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis						
Arsenic, Dissolved	<b>6.5</b>	ug/L	1.0	1	07/03/23 18:15	07/05/23 17:51	7440-38-2	
<b>Iron, Ferric (Calculation)</b>		Analytical Method: SM 3500-Fe D#4 Pace Analytical Services - Indianapolis						
Iron, Ferric	<b>1.2</b>	mg/L	0.20	1		07/12/23 15:03	20074-52-6	N2

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-2 (0.20 um)	Lab ID: 50348165002	Collected: 06/24/23 07:50	Received: 06/27/23 10:05	Matrix: Water					
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
<b>6020 MET ICPMS, Dissolved</b>	Analytical Method: EPA 6020 Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	5.8	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:18	7440-38-2		

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-105	Lab ID: 50348165003	Collected: 06/24/23 12:20	Received: 06/27/23 10:05	Matrix: Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Pace Analytical Services - Indianapolis								
Arsenic	<b>15.3</b>	ug/L	10.0	1	06/29/23 09:03	07/06/23 02:01	7440-38-2	
Iron	<b>38200</b>	ug/L	100	1	06/29/23 09:03	07/06/23 02:01	7439-89-6	
<b>6020 MET ICPMS, Dissolved</b>								
Analytical Method: EPA 6020 Preparation Method: EPA 200.2								
Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	<b>14.0</b>	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:22	7440-38-2	
<b>Iron, Ferric (Calculation)</b>								
Analytical Method: SM 3500-Fe D#4								
Pace Analytical Services - Indianapolis								
Iron, Ferric	<b>34.9</b>	mg/L	0.20	1		07/12/23 15:03	20074-52-6	N2

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-105 (0.20 um)		Lab ID: 50348165004	Collected: 06/24/23 12:20	Received: 06/27/23 10:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>								
Analytical Method: EPA 6020 Preparation Method: EPA 200.2								
Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	13.8	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:26	7440-38-2	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-106S Lab ID: 50348165005 Collected: 06/24/23 11:30 Received: 06/27/23 10:05 Matrix: Water

Comments: • The Ferric Iron concentratin could not be calculated as the ferrous Iron field reading couldn't be supplied. kh071123

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>		Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Indianapolis						
Arsenic	60.7	ug/L	10.0	1	06/29/23 09:03	07/06/23 02:03	7440-38-2	
Iron	9180	ug/L	100	1	06/29/23 09:03	07/06/23 02:03	7439-89-6	
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis						
Arsenic, Dissolved	55.6	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:38	7440-38-2	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-106S (0.2 um)		Lab ID: 50348165006	Collected: 06/24/23 11:30	Received: 06/27/23 10:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>								
Analytical Method: EPA 6020 Preparation Method: EPA 200.2								
Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	59.2	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:42	7440-38-2	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: MW-106D		Lab ID: 50348165007		Collected: 06/24/23 10:00		Received: 06/27/23 10:05		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
<b>6010 MET ICP</b>		Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Indianapolis							
Arsenic	ND	ug/L	10.0	1	06/29/23 09:03	07/06/23 02:05	7440-38-2		
Iron	444	ug/L	100	1	06/29/23 09:03	07/06/23 02:05	7439-89-6		
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis							
Arsenic, Dissolved	1.1	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:46	7440-38-2		
<b>Iron, Ferric (Calculation)</b>		Analytical Method: SM 3500-Fe D#4 Pace Analytical Services - Indianapolis							
Iron, Ferric	ND	mg/L	0.20	1		07/12/23 15:03	20074-52-6	N2	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>Sample: MW-106D (0.2 um)      Lab ID: 50348165008      Collected: 06/24/23 10:00      Received: 06/27/23 10:05      Matrix: Water</b>								
<b>6020 MET ICPMS, Dissolved</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	1.1	ug/L	1.0	1	07/03/23 18:15	07/05/23 18:58	7440-38-2	

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: DUP		Lab ID: 50348165009		Collected: 06/24/23 10:30	Received: 06/27/23 10:05	Matrix: Water		
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>		Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Indianapolis						
Arsenic	ND	ug/L	10.0	1	06/29/23 09:03	07/06/23 02:07	7440-38-2	
Iron	446	ug/L	100	1	06/29/23 09:03	07/06/23 02:07	7439-89-6	
<b>6020 MET ICPMS, Dissolved</b>		Analytical Method: EPA 6020 Preparation Method: EPA 200.2 Pace Analytical Services - Indianapolis						
Arsenic, Dissolved	1.2	ug/L	1.0	1	07/03/23 18:15	07/05/23 19:02	7440-38-2	
<b>Iron, Ferric (Calculation)</b>		Analytical Method: SM 3500-Fe D#4 Pace Analytical Services - Indianapolis						
Iron, Ferric	ND	mg/L	0.20	1		07/12/23 15:03	20074-52-6	N2

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Sample: DUP (0.20 um)		Lab ID: 50348165010	Collected: 06/24/23 10:30	Received: 06/27/23 10:05	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS, Dissolved</b>								
Analytical Method: EPA 6020 Preparation Method: EPA 200.2								
Pace Analytical Services - Indianapolis								
Arsenic, Dissolved	1.3	ug/L	1.0	1	07/03/23 18:15	07/05/23 19:06	7440-38-2	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

QC Batch:	741447	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3010	Analysis Description:	6010 MET
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50348165001, 50348165003, 50348165005, 50348165007, 50348165009

METHOD BLANK: 3400522 Matrix: Water

Associated Lab Samples: 50348165001, 50348165003, 50348165005, 50348165007, 50348165009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	ug/L	ND	10.0	07/06/23 01:11	
Iron	ug/L	ND	100	07/06/23 01:11	

LABORATORY CONTROL SAMPLE: 3400523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	1000	1010	101	80-120	
Iron	ug/L	10000	10100	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3400524 3400525

Parameter	Units	50348126008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	<4.1	1000	1000	1020	1040	102	104	75-125	2	20	
Iron	ug/L	344	10000	10000	10100	10400	98	100	75-125	3	20	

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 DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

QC Batch:	742060	Analysis Method:	EPA 6020
QC Batch Method:	EPA 200.2	Analysis Description:	6020 MET Dissolved
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50348165001, 50348165002, 50348165003, 50348165004, 50348165005, 50348165006, 50348165007, 50348165008, 50348165009, 50348165010

METHOD BLANK: 3403786 Matrix: Water

Associated Lab Samples: 50348165001, 50348165002, 50348165003, 50348165004, 50348165005, 50348165006, 50348165007, 50348165008, 50348165009, 50348165010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic, Dissolved	ug/L	ND	1.0	07/05/23 17:35	

LABORATORY CONTROL SAMPLE: 3403787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic, Dissolved	ug/L	40	39.4	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3403788 3403789

Parameter	Units	50348165001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic, Dissolved	ug/L	6.5	40	40	46.8	46.8	101	101	75-125	0	20	

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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## QUALIFIERS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

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### 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.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BREC Sebree Station Green CCR

Pace Project No.: 50348165

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50348165001	MW-2	EPA 3010	741447	EPA 6010	742399
50348165003	MW-105	EPA 3010	741447	EPA 6010	742399
50348165005	MW-106S	EPA 3010	741447	EPA 6010	742399
50348165007	MW-106D	EPA 3010	741447	EPA 6010	742399
50348165009	DUP	EPA 3010	741447	EPA 6010	742399
50348165001	MW-2	EPA 200.2	742060	EPA 6020	742319
50348165002	MW-2 (0.20 um)	EPA 200.2	742060	EPA 6020	742319
50348165003	MW-105	EPA 200.2	742060	EPA 6020	742319
50348165004	MW-105 (0.20 um)	EPA 200.2	742060	EPA 6020	742319
50348165005	MW-106S	EPA 200.2	742060	EPA 6020	742319
50348165006	MW-106S (0.2 um)	EPA 200.2	742060	EPA 6020	742319
50348165007	MW-106D	EPA 200.2	742060	EPA 6020	742319
50348165008	MW-106D (0.2 um)	EPA 200.2	742060	EPA 6020	742319
50348165009	DUP	EPA 200.2	742060	EPA 6020	742319
50348165010	DUP (0.20 um)	EPA 200.2	742060	EPA 6020	742319
50348165001	MW-2	SM 3500-Fe D#4	743334		
50348165003	MW-105	SM 3500-Fe D#4	743334		
50348165007	MW-106D	SM 3500-Fe D#4	743334		
50348165009	DUP	SM 3500-Fe D#4	743334		

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**CHAIN-OF-CUSTODY / Analytical Request Doc**

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be filled out.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at <https://info.pacelabs.com>

**WO#: 50348165**



50348165

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: Burns & McDonnell	Report To: Hagedorn, Chris	Attention: Accounts Payable	Company Name: Burns & McDonnell	Address:	
Address: 9450 Ward Parkway	Copy To:	Purchase Order #:		Pace Quote: 91942623	
Address City: MO 64114	Project Name: BREC Sabree Station (Green COR Landfill)	Pace Project Manager: zeronoth.burns@pacelabs.com		Regulatory Agency:	
Email: cgraylund@burnsmcd.com	Project #:	Pace Profile #: 9106 Line 4		State / Location:	
Phone: 785-317-1747	Requested Due Date: Standard VAT			KY	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / -) Sample IDs must be unique	MATRIX	DATE	TIME	START DATE	END DATE	TEMP	PRESERVATIVES	ANALYSES TEST	Requested Analysis Filtered (Y/N)					Field Data for Ferrous Iron mg/L (Fe <sup>2+</sup> )	Residual Chloride (Y/N)
										As	Pb	Cd	Cu	Zn		
1	MW-2	WT	6/26/23	1230					Y	Y	Y	Y	Y	1.33		
2	MW-2 (0.20 um)	WT	6/26/23	1230							X					
3	MW-105	WT	6/26/23	1230					X	X	X	X		3.37		
4	MW-105 (0.20 um)	WT	6/26/23	1230							X					
5	MW-106S	WT	6/26/23	1130					X	X	X	X		"+++"		
6	MW-106S (0.2 um)	WT	6/26/23	1130							X					
7	MW-106D	WT	6/26/23	1000					X	X	X	Y		0.47		
8	MW-106D (0.2 um)	WT	6/26/23	1000							X					
9	DUP	WT	6/26/23	1030					X	X	X	X		0.91		
10	DUP (0.20 um)	WT	6/26/23	1030							X					

001  
002  
003  
004  
005  
006  
007  
008  
009  
010

Res. Iron Control  
MW-106S 1-1-23 005  
MW-106S 1-1-23 006

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Gravimeter Serial Number 181390287 181460057 Temp 1.1°C	Spencer/Dier/BREC Keruehl ER UPS	6/26/23	1230	K... UPS Daniel Fewster Pace	6-26-23	1230	0.0 Y Y Y

SAMPLER NAME AND SIGNATURE		DATE Signed: 6/26/23
PRINT Name of SAMPLER: Green Dier (BREC)	SIGNATURE of SAMPLER: <i>[Signature]</i>	

*Pace*

**SAMPLE CONDITION UPON RECEIPT FORM**

Date/Time and Initials of person examining contents: DMP 6/27/23 12:38

1. Courier:  FED EX  UPS  CLIENT  PACE  NOW/JETT  OTHER \_\_\_\_\_

2. Custody Seal on Cooler/Box Present:  Yes  No  
 (If yes)Seals Intact:  Yes  No (leave blank if no seals were present)

3. Thermometer: 1 2 3 4 5 6 7 8 A B C D E F G H

4. Cooler Temperature(s): -0.1°/0.0°     
 (Initial/Corrected) RECORD TEMPS OF ALL COOLERS RECEIVED (use Comments below to add more)

5. Packing Material:  Bubble Wrap  Bubble Bags  
 None  Other ZPLC

6. Ice Type:  Wet  Blue  None

7. If temp. is over 6°C or under 0°C, was the PM notified?:  Yes  No  
 Cooler temp should be above freezing to 6°C

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing acid/base preservation have been pH CHECKED?. Exceptions: VOA, coliform, LLHg, O&G, RAD CHEM, and any container with a septum cap or preserved with HCl.		<input checked="" type="checkbox"/>	
Short Hold Time Analysis (48 hours or less)? Analysis:		<input checked="" type="checkbox"/>	Circle: HNO3 (<2) H2SO4 (<2) NaOH (>10) NaOH/ZnAc (>9) Any non-conformance to pH recommendations will be noted on the container count form		<input checked="" type="checkbox"/>	
Time 5035A TC placed in Freezer or Short Holds To Lab Time:				<u>Present</u>	<u>Absent</u>	<u>N/A</u>
Rush TAT Requested (4 days or less):	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Residual Chlorine Check (SVOC 625 Pest/PCB 608)			<input checked="" type="checkbox"/>
Custody Signatures Present?	<input checked="" type="checkbox"/>		Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Containers Intact?	<input checked="" type="checkbox"/>		Headspace Wisconsin Sulfide?			<input checked="" type="checkbox"/>
Sample Label (IDs/Dates/Times) Match COC? Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Headspace in VOA Vials (>6mm): See Container Count form for details	<u>Present</u>	<u>Absent</u>	<u>No VOA Vials Sent</u>
Extra labels on Terracore Vials? (soils only)		<u>N/A</u>	Trip Blank Present?		<input checked="" type="checkbox"/>	
			Trip Blank Custody Seals?			<input checked="" type="checkbox"/>

COMMENTS:

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13751 Lake City Way NE, Ste 108, Seattle, WA 98125 • USA • T:206-632-6206 • info@brooksapplied.com

July 14, 2023

Pace Analytical Services – Indianapolis  
ATTN: Kenneth Hunt  
7726 Moller Road  
Indianapolis, IN 46268  
Kenneth.Hunt@pacelabs.com

RE: Project PAC-IN2302

Client Project: 50348165

Dear Kenneth Hunt,

On June 28, 2023, Brooks Applied Labs (BAL) received five (5) water samples. The samples were logged-in for the analyses of arsenic speciation [As(III) and As(V)] according to the chain-of-custody form. All samples were received and stored according to BAL SOPs and EPA methodology.

All samples were field filtered.

*Arsenic Speciation Quantitation by IC-ICP-CRC-MS*

Arsenic speciation was performed by ion chromatography inductively coupled plasma collision reaction cell mass spectrometry (IC-ICP-CRC-MS). Arsenic species are first chromatographically separated on an ion exchange column and then quantified using inductively coupled plasma collision reaction cell mass spectrometry (ICP-CRC-MS). For more information on this determinative technique, please visit the Interference Reduction Technology section on our website.

It should be noted that all Brooks Applied Labs, LLC methods, standard operating procedures, inventions, ideas, processes, improvements, designs, and techniques included or referred to therein, must be considered and treated as Proprietary Information, protected by the Washington State Trade Secret Act, RCW 19.108 et seq., and other laws. All Proprietary Information, written or implied, will not be distributed, copied, or altered in any fashion without prior written consent from Brooks Applied Labs, LLC. All Proprietary Information (including originals, copies, summaries, or other reproductions thereof) shall remain the property of Brooks Applied Labs, LLC at all times and must be returned upon demand. Furthermore, products presented in this document may be protected by Federal Patent laws and infringement will be subject to prosecution in accordance with Title 35 US Code 271.

In instances where the native sample result and/or the associated duplicate (DUP) result were below the MDL the RPD was not calculated (**N/C**).

The results were not method blank corrected, as described in the calculations section of the relevant BAL SOP(s), and were evaluated using reporting limits adjusted to account for sample aliquot size. Please refer to the *Sample Results* page for sample-specific MDLs, MRLs, and other details.

All data was reported without further qualification and all other associated quality control sample results met the acceptance criteria.

BAL verifies that the reported results of all analyses for which the laboratory is accredited meet the requirements of the accrediting body, unless otherwise noted in the report narrative. For more information regarding accreditations please see the *Report Information* and *Batch Summary* pages. This report must be used in its entirety for interpretation of results.

Please feel free to contact us if you have any questions regarding this report.

Sincerely,

A handwritten signature in cursive script that reads "Amy Goodall".

Amy Goodall  
Project Manager  
Brooks Applied Labs  
email@brooksapplied.com



## Report Information

### General Disclaimers

Test results are based solely upon the sample submitted to Brooks Applied Labs in the condition it was received. This report shall not be reproduced or copied, except in full, without written approval of the laboratory. Brooks Applied Labs is not responsible for the consequences arising from the use of a partial report.

### Laboratory Accreditation

BAL maintains accreditation with various state and national agencies for select test methods. For a current list of BAL accreditations, please visit our website at <http://www.brooksapplied.com/resources/certificates-permits/>. The reported analyte/matrix/method combination shall be considered outside BAL's scopes of accreditation unless otherwise identified as ISO, TNI, or ISO,TNI in the tables. It is the responsibility of the client to verify whether a specific accreditation is required for the intended data use.

**ISO:** ISO/IEC 17025:2017 accredited test method. Issued by ANSI National Accreditation Board (ANAB), #ADE-1447.02.

**TNI:** NELAP accredited test method. Issued by the State of Florida Department of Health, #E87982.

**ISO,TNI:** Test method is accredited under both the ISO/IEC 17025:2017 and NELAP accreditations referenced above.

### Field Quality Control Samples

Please be notified that certain EPA methods require the collection of field quality control samples of an appropriate type and frequency; failure to do so is considered a deviation from some methods and for compliance purposes should only be done with the approval of regulatory authorities. Please see the specific EPA methods for details regarding required field quality control samples.

### Common Abbreviations

<b>AR</b>	as received	<b>MS</b>	matrix spike
<b>BAL</b>	Brooks Applied Labs	<b>MSD</b>	matrix spike duplicate
<b>BLK</b>	method blank	<b>ND</b>	non-detect
<b>BS</b>	blank spike	<b>NR</b>	non-reportable
<b>CAL</b>	calibration standard	<b>N/C</b>	not calculated
<b>CCB</b>	continuing calibration blank	<b>PS</b>	post preparation spike
<b>CCV</b>	continuing calibration verification	<b>REC</b>	percent recovery
<b>COC</b>	chain of custody record	<b>RPD</b>	relative percent difference
<b>D</b>	dissolved fraction	<b>SCV</b>	secondary calibration verification
<b>DUP</b>	duplicate	<b>SOP</b>	standard operating procedure
<b>IBL</b>	instrument blank	<b>SRM</b>	reference material
<b>ICV</b>	initial calibration verification	<b>T</b>	total fraction
<b>MDL</b>	method detection limit	<b>TR</b>	total recoverable fraction
<b>MRL</b>	method reporting limit		

### Definition of Data Qualifiers

<b>E</b>	An estimated value due to the presence of interferences. A full explanation is presented in the narrative.
<b>H</b>	Holding time and/or preservation requirements not met. Please see narrative for explanation.
<b>J</b>	Detected by the instrument, the result is > the MDL but ≤ the MRL. Result is reported and considered an estimate.
<b>J-1</b>	Estimated value. A full explanation is presented in the narrative.
<b>M</b>	Duplicate precision (RPD) was not within acceptance criteria. Please see narrative for explanation.
<b>N</b>	Spike recovery was not within acceptance criteria. Please see narrative for explanation.
<b>R</b>	Rejected, unusable value. A full explanation is presented in the narrative.
<b>U</b>	Result is ≤ the MDL or client requested reporting limit (CRRL). Result reported as the MDL or CRRL.
<b>X</b>	Result is not BLK-corrected and is within 10x the absolute value of the highest detectable BLK in the batch. Result is estimated.
<b>Z</b>	Holding time and/or preservation requirements not established for this method; however, BAL recommendations for holding time were not followed. Please see narrative for explanation.





## Sample Information

Sample	Alias	Lab ID	Report Matrix	Type	Sampled	Received
MW-2	50348165001	2306474-01	Water	Sample	06/24/2023	06/28/2023
MW-105	50348165003	2306474-02	Water	Sample	06/24/2023	06/28/2023
MW-106S	50348165005	2306474-03	Water	Sample	06/24/2023	06/28/2023
MW-106D	50348165007	2306474-04	Water	Sample	06/24/2023	06/28/2023
DUP	50348165009	2306474-05	Water	Sample	06/24/2023	06/28/2023

## Batch Summary

Analyte	Lab Matrix	Method	Accred.	Prepared	Analyzed	Batch	Sequence
As(III)	Water	SOP BAL-4100	ISO,TNI	07/06/23	07/07/23	B231616	S230671
As(V)	Water	SOP BAL-4100	ISO,TNI	07/06/23	07/07/23	B231616	S230671



## Sample Results

Sample	Analyte	Report Matrix	Basis	Result	Qualifier	MDL	MRL	Unit	Batch	Sequence
<b>MW-2, 50348165001</b>										
2306474-01	As(III)	Water	D	5.16		0.200	1.05	µg/L	B231616	S230671
2306474-01	As(V)	Water	D	1.16		0.500	1.05	µg/L	B231616	S230671
<b>MW-105, 50348165003</b>										
2306474-02	As(III)	Water	D	7.30		0.200	1.05	µg/L	B231616	S230671
2306474-02	As(V)	Water	D	6.95		0.500	1.05	µg/L	B231616	S230671
<b>MW-106S, 50348165005</b>										
2306474-03	As(III)	Water	D	60.1		0.200	1.05	µg/L	B231616	S230671
2306474-03	As(V)	Water	D	12.5		0.500	1.05	µg/L	B231616	S230671
<b>MW-106D, 50348165007</b>										
2306474-04	As(III)	Water	D	1.03	J	0.200	1.05	µg/L	B231616	S230671
2306474-04	As(V)	Water	D	≤ 0.500	U	0.500	1.05	µg/L	B231616	S230671
<b>DUP, 50348165009</b>										
2306474-05	As(III)	Water	D	1.04	J	0.200	1.05	µg/L	B231616	S230671
2306474-05	As(V)	Water	D	≤ 0.500	U	0.500	1.05	µg/L	B231616	S230671



## Accuracy & Precision Summary

Batch: B231616  
 Lab Matrix: Water  
 Method: SOP BAL-4100

Sample	Analyte	Native	Spike	Result	Units	REC & Limits	RPD & Limits
B231616-BS1	<b>Blank Spike, (2306014)</b>						
	As(III)		5.000	5.648	µg/L	113% 75-125	
	As(V)		5.000	4.956	µg/L	99% 75-125	
B231616-DUP1	<b>Duplicate, (2306474-05)</b>						
	As(III)	1.035		0.883	µg/L		16% 25
	As(V)	ND		ND	µg/L		N/C 25
B231616-MS1	<b>Matrix Spike, (2306474-05)</b>						
	As(III)	1.035	52.25	57.37	µg/L	108% 75-125	
	As(V)	ND	48.55	52.10	µg/L	107% 75-125	
B231616-MSD1	<b>Matrix Spike Duplicate, (2306474-05)</b>						
	As(III)	1.035	52.25	57.04	µg/L	107% 75-125	0.6% 25
	As(V)	ND	48.55	51.43	µg/L	106% 75-125	1% 25



## Method Blanks & Reporting Limits

**Batch:** B231616  
**Matrix:** Water  
**Method:** SOP BAL-4100  
**Analyte:** As(III)

Sample	Result	Units	
B231616-BLK1	0.00	µg/L	
B231616-BLK2	0.00	µg/L	
B231616-BLK3	0.00	µg/L	
B231616-BLK4	0.00	µg/L	
<b>Average:</b>	<b>0.000</b>		<b>MDL: 0.004</b>
<b>Limit:</b>	<b>0.021</b>		<b>MRL: 0.021</b>

**Analyte:** As(V)

Sample	Result	Units	
B231616-BLK1	0.001	µg/L	
B231616-BLK2	0.00	µg/L	
B231616-BLK3	0.00	µg/L	
B231616-BLK4	0.002	µg/L	
<b>Average:</b>	<b>0.001</b>		<b>MDL: 0.010</b>
<b>Limit:</b>	<b>0.021</b>		<b>MRL: 0.021</b>



## Sample Containers

Lab ID: 2306474-01  
 Sample: MW-2

Report Matrix: Water  
 Sample Type: Sample

Collected: 06/24/2023  
 Received: 06/28/2023

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474
B	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474

Lab ID: 2306474-02  
 Sample: MW-105

Report Matrix: Water  
 Sample Type: Sample

Collected: 06/24/2023  
 Received: 06/28/2023

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Vacutainer	10 mL	23-0029	EDTA (in vial)	na	na	Cooler - 2306474
B	Vacutainer	10 mL	23-0029	EDTA (in vial)	na	na	Cooler - 2306474

Lab ID: 2306474-03  
 Sample: MW-106S

Report Matrix: Water  
 Sample Type: Sample

Collected: 06/24/2023  
 Received: 06/28/2023

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474
C	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474

Lab ID: 2306474-04  
 Sample: MW-106D

Report Matrix: Water  
 Sample Type: Sample

Collected: 06/24/2023  
 Received: 06/28/2023

Des	Container	Size	Lot	Preservation	P-Lot	pH	Ship. Cont.
A	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474
C	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474

**Project ID:** PAC-IN2302  
**PM:** Amy Goodall



BAL Report 2306474  
**Client PM:** Kenneth Hunt  
**Client Project:** 50348165

## Sample Containers

**Lab ID:** 2306474-05  
**Sample:** DUP

**Report Matrix:** Water  
**Sample Type:** Sample

**Collected:** 06/24/2023  
**Received:** 06/28/2023

<b>Des</b>	<b>Container</b>	<b>Size</b>	<b>Lot</b>	<b>Preservation</b>	<b>P-Lot</b>	<b>pH</b>	<b>Ship. Cont.</b>
A	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474
C	Vacutainer	10 mL	23-0005	EDTA (in vial)	na	na	Cooler - 2306474

## Shipping Containers

### Cooler - 2306474

**Received:** June 28, 2023 9:53  
**Tracking No:** 6426 8103 9540 via FedEx  
**Coolant Type:** Ice  
**Temperature:** 2.7 °C

**Description:** Cooler  
**Damaged in transit?** No  
**Returned to client?** No  
**Comments:** R-IR-4

**Custody seals present?** No  
**Custody seals intact?** No  
**COC present?** Yes



# Chain of Custody

PASI Indiana Laboratory



Workorder: 50348165

Workorder Name: BREC Sebree Station Green CCR

Results Requested By: 7/12/2023

Kenneth Hunt  
Pace Analytical Indianapolis  
7726 Moller Road  
Indianapolis, IN 46268  
Phone (317)228-3100  
Email: kenneth.hunt@pacelabs.com

Brooks Applied Labs  
13751 Lake City Way NE  
Suite 108  
Seattle, WA 98125  
P.O. 50348165

State of Sample Origin: KY

Item	Sample ID	Collect Date/Time	Lab ID	Matrix	General	Asenic Speciation Sub Brooks Applied	LAB USE ONLY
1	MW-2	6/24/2023 07:50	50348165001	Water	2	X	
2	MW-106	6/24/2023 12:20	50348165003	Water	2	X	
3	MW-106S	6/24/2023 11:30	50348165005	Water	2	X	
4	MW-106D	6/24/2023 10:00	50348165007	Water	2	X	
5	DUP	6/24/2023 10:30	50348165009	Water	2	X	

Transfers	Released By	Date/Time	Received By	Date/Time	Received on Ice	Y or N	Y or N	Samples Intact	Y or N
1	<i>M. Clark</i>	6-27-23 16:50	<i>FedEx</i>			Y	N		
2	<i>FedEx</i>		<i>BAL</i>	6/28/23 09:53		Y	N		
3									

Cooler Temperature on Receipt 2.7 °C

Report Speciated Arsenic +3 and +5.

May 12, 2023

Mr. Chris Hoglund  
Burn & McDonnell  
9450 Ward Parkway  
Kansas City, MO 64114

RE: Project: BREC Sebree Station Green CCR  
Pace Project No.: 50343859

Dear Mr. Hoglund:

Enclosed are the analytical results for sample(s) received by the laboratory on May 03, 2023. 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 - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Kenneth Hunt  
kenneth.hunt@pacelabs.com  
(317)228-3100  
Project Manager

Enclosures

cc: Mr. Daniel Jelinek, Burns & McDonnell Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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### **Pace Analytical Services Indianapolis**

7726 Moller Road, Indianapolis, IN 46268

Illinois Accreditation #: 200074

Indiana Drinking Water Laboratory #: C-49-06

Kansas/TNI Certification #: E-10177

Kentucky UST Agency Interest #: 80226

Kentucky WW Laboratory ID #: 98019

Michigan Drinking Water Laboratory #9050

Ohio VAP Certified Laboratory #: CL0065

Oklahoma Laboratory #: 9204

Texas Certification #: T104704355

Wisconsin Laboratory #: 999788130

USDA Foreign Soil Permit #: 525-23-13-23119

USDA Compliance Agreement #: IN-SL-22-001

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50343859001	MW-105-31-32	Solid	04/25/23 17:00	05/03/23 09:30
50343859002	MW-105-28-30	Solid	04/25/23 17:15	05/03/23 09:30
50343859003	MW-105-23-25	Solid	04/25/23 17:20	05/03/23 09:30
50343859004	MW-105-15-17	Solid	04/25/23 17:30	05/03/23 09:30
50343859005	MW-106S-22-24	Solid	04/26/23 13:45	05/03/23 09:30
50343859006	MW-106S-37-39	Solid	04/26/23 13:55	05/03/23 09:30
50343859007	Dup-1	Solid	04/26/23 08:00	05/03/23 09:30
50343859008	MW-106D-51-53	Solid	04/27/23 12:30	05/03/23 09:30
50343859009	MW-106D-58-60	Solid	04/27/23 12:40	05/03/23 09:30

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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### SAMPLE ANALYTE COUNT

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50343859001	MW-105-31-32	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	OAS	1	PASI-I
50343859002	MW-105-28-30	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	OAS	1	PASI-I
50343859003	MW-105-23-25	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	OAS	1	PASI-I
50343859004	MW-105-15-17	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	OAS	1	PASI-I
50343859005	MW-106S-22-24	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	QAK	1	PASI-I
50343859006	MW-106S-37-39	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	QAK	1	PASI-I
50343859007	Dup-1	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	QAK	1	PASI-I
50343859008	MW-106D-51-53	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	RJP	1	PASI-I
50343859009	MW-106D-58-60	EPA 6010	JPK	1	PASI-I
		EPA 6010	JPK	2	PASI-I
		EPA 6020	MGM	1	PASI-I
		SM 2540G	RJP	1	PASI-I

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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<b>Lab ID</b>	<b>Sample ID</b>	<b>Method</b>	<b>Analysts</b>	<b>Analytes Reported</b>	<b>Laboratory</b>
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PASI-I = Pace Analytical Services - Indianapolis

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>50343859001</b>	<b>MW-105-31-32</b>					
EPA 6010	Iron	56400	mg/kg	963	05/12/23 02:43	
EPA 6010	Arsenic	0.024	mg/L	0.010	05/11/23 03:07	
EPA 6010	Iron	39.7	mg/L	0.10	05/11/23 03:07	
EPA 6020	Arsenic	26.2	mg/kg	1.1	05/09/23 19:11	
SM 2540G	Percent Moisture	10.7	%	0.10	05/05/23 19:09	N2
<b>50343859002</b>	<b>MW-105-28-30</b>					
EPA 6010	Iron	24700	mg/kg	109	05/12/23 02:45	
EPA 6010	Arsenic	0.012	mg/L	0.010	05/11/23 03:21	
EPA 6010	Iron	35.8	mg/L	0.10	05/11/23 03:21	
EPA 6020	Arsenic	3.0	mg/kg	1.2	05/09/23 19:39	
SM 2540G	Percent Moisture	17.6	%	0.10	05/05/23 19:09	N2
<b>50343859003</b>	<b>MW-105-23-25</b>					
EPA 6010	Iron	23600	mg/kg	60.2	05/12/23 02:29	
EPA 6010	Arsenic	0.056	mg/L	0.010	05/11/23 03:23	
EPA 6010	Iron	141	mg/L	0.10	05/11/23 03:23	
EPA 6020	Arsenic	6.2	mg/kg	1.2	05/09/23 19:43	
SM 2540G	Percent Moisture	22.0	%	0.10	05/05/23 19:10	N2
<b>50343859004</b>	<b>MW-105-15-17</b>					
EPA 6010	Iron	20500	mg/kg	56.1	05/12/23 02:31	
EPA 6010	Iron	3.6	mg/L	0.10	05/11/23 03:26	
EPA 6020	Arsenic	6.3	mg/kg	1.2	05/09/23 19:47	
SM 2540G	Percent Moisture	19.5	%	0.10	05/05/23 19:10	N2
<b>50343859005</b>	<b>MW-106S-22-24</b>					
EPA 6010	Iron	17800	mg/kg	53.1	05/12/23 02:33	
EPA 6010	Arsenic	0.046	mg/L	0.010	05/11/23 03:28	
EPA 6010	Iron	152	mg/L	0.10	05/11/23 03:28	
EPA 6020	Arsenic	2.4	mg/kg	1.2	05/09/23 19:51	
SM 2540G	Percent Moisture	19.6	%	0.10	05/10/23 13:18	N2
<b>50343859006</b>	<b>MW-106S-37-39</b>					
EPA 6010	Iron	25000	mg/kg	112	05/12/23 02:57	
EPA 6010	Arsenic	0.036	mg/L	0.010	05/11/23 03:30	
EPA 6010	Iron	74.2	mg/L	0.10	05/11/23 03:30	
EPA 6020	Arsenic	3.6	mg/kg	1.2	05/09/23 20:03	
SM 2540G	Percent Moisture	17.0	%	0.10	05/10/23 13:19	N2
<b>50343859007</b>	<b>Dup-1</b>					
EPA 6010	Iron	15500	mg/kg	57.4	05/12/23 02:38	
EPA 6010	Arsenic	0.058	mg/L	0.010	05/11/23 03:32	
EPA 6010	Iron	189	mg/L	0.10	05/11/23 03:32	
EPA 6020	Arsenic	3.6	mg/kg	1.2	05/09/23 20:07	
SM 2540G	Percent Moisture	20.2	%	0.10	05/10/23 13:19	N2
<b>50343859008</b>	<b>MW-106D-51-53</b>					
EPA 6010	Iron	45900	mg/kg	222	05/12/23 03:00	
EPA 6020	Arsenic	6.6	mg/kg	1.0	05/09/23 20:11	

### REPORT OF LABORATORY ANALYSIS

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### SUMMARY OF DETECTION

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
<b>50343859008</b>	<b>MW-106D-51-53</b>					
SM 2540G	Percent Moisture	4.8	%	0.10	05/11/23 17:21	N2
<b>50343859009</b>	<b>MW-106D-58-60</b>					
EPA 6010	Iron	21600	mg/kg	98.9	05/12/23 03:02	
EPA 6010	Iron	6.3	mg/L	0.10	05/11/23 03:41	
EPA 6020	Arsenic	1.5	mg/kg	1.0	05/09/23 20:15	
SM 2540G	Percent Moisture	4.7	%	0.10	05/11/23 17:22	N2

### REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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**Method:** EPA 6010

**Description:** 6010 MET ICP

**Client:** Burns & McDonnell Engineering Company, Inc.

**Date:** May 12, 2023

**General Information:**

9 samples were analyzed for EPA 6010 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3050 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 731743

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50343772002

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 3358201)
  - Iron
- MSD (Lab ID: 3358202)
  - Iron

**Additional Comments:**

Analyte Comments:

QC Batch: 731743

E: Analyte concentration exceeded the calibration range. The reported result is estimated.

- MS (Lab ID: 3358201)
  - Iron
- MSD (Lab ID: 3358202)
  - Iron

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## PROJECT NARRATIVE

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

---

**Method:** EPA 6010

**Description:** 6010 MET ICP, SPLP

**Client:** Burns & McDonnell Engineering Company, Inc.

**Date:** May 12, 2023

**General Information:**

9 samples were analyzed for EPA 6010 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3010 with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 732567

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50343859001

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 3362125)
  - Iron
- MSD (Lab ID: 3362126)
  - Iron

**Additional Comments:**

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## PROJECT NARRATIVE

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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**Method:** EPA 6020

**Description:** 6020 MET ICPMS

**Client:** Burns & McDonnell Engineering Company, Inc.

**Date:** May 12, 2023

**General Information:**

9 samples were analyzed for EPA 6020 by Pace Analytical Services Indianapolis. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Sample Preparation:**

The samples were prepared in accordance with EPA 3050B with any exceptions noted below.

**Initial Calibrations (including MS Tune as applicable):**

All criteria were within method requirements with any exceptions noted below.

**Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

**Internal Standards:**

All internal standards were within QC limits with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 731827

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 50343859001

P6: Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

- MS (Lab ID: 3358767)
  - Arsenic
- MSD (Lab ID: 3358768)
  - Arsenic

R1: RPD value was outside control limits.

- MSD (Lab ID: 3358768)
  - Arsenic

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-105-31-32**      **Lab ID: 50343859001**      Collected: 04/25/23 17:00      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>56400</b>	mg/kg	963	20	05/08/23 08:17	05/12/23 02:43	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	<b>0.024</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:07	7440-38-2	
Iron	<b>39.7</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:07	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>26.2</b>	mg/kg	1.1	10	05/06/23 05:45	05/09/23 19:11	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>10.7</b>	%	0.10	1		05/05/23 19:09		N2

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-105-28-30**      **Lab ID: 50343859002**      Collected: 04/25/23 17:15      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>24700</b>	mg/kg	109	2	05/08/23 08:17	05/12/23 02:45	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	<b>0.012</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:21	7440-38-2	
Iron	<b>35.8</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:21	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>3.0</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 19:39	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>17.6</b>	%	0.10	1		05/05/23 19:09		N2

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-105-23-25**      **Lab ID: 50343859003**      Collected: 04/25/23 17:20      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>23600</b>	mg/kg	60.2	1	05/08/23 08:17	05/12/23 02:29	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	<b>0.056</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:23	7440-38-2	
Iron	<b>141</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:23	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>6.2</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 19:43	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>22.0</b>	%	0.10	1		05/05/23 19:10		N2

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-105-15-17**      **Lab ID: 50343859004**      Collected: 04/25/23 17:30      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>20500</b>	mg/kg	56.1	1	05/08/23 08:17	05/12/23 02:31	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	ND	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:26	7440-38-2	
Iron	<b>3.6</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:26	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>6.3</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 19:47	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>19.5</b>	%	0.10	1		05/05/23 19:10		N2

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-106S-22-24**      **Lab ID: 50343859005**      Collected: 04/26/23 13:45      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>17800</b>	mg/kg	53.1	1	05/08/23 08:17	05/12/23 02:33	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	<b>0.046</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:28	7440-38-2	
Iron	<b>152</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:28	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>2.4</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 19:51	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>19.6</b>	%	0.10	1		05/10/23 13:18		N2

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-106S-37-39**      **Lab ID: 50343859006**      Collected: 04/26/23 13:55      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3050								
Pace Analytical Services - Indianapolis								
Iron	<b>25000</b>	mg/kg	112	2	05/08/23 08:17	05/12/23 02:57	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Leachate Method/Date: EPA 1312; 05/06/23 16:45								
Pace Analytical Services - Indianapolis								
Arsenic	<b>0.036</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:30	7440-38-2	
Iron	<b>74.2</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:30	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020 Preparation Method: EPA 3050B								
Pace Analytical Services - Indianapolis								
Arsenic	<b>3.6</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 20:03	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G								
Pace Analytical Services - Indianapolis								
Percent Moisture	<b>17.0</b>	%	0.10	1		05/10/23 13:19		N2

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### ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: Dup-1**      **Lab ID: 50343859007**      Collected: 04/26/23 08:00      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>15500</b>	mg/kg	57.4	1	05/08/23 08:17	05/12/23 02:38	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	<b>0.058</b>	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:32	7440-38-2	
Iron	<b>189</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:32	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>3.6</b>	mg/kg	1.2	10	05/06/23 05:45	05/09/23 20:07	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>20.2</b>	%	0.10	1		05/10/23 13:19		N2

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-106D-51-53**      **Lab ID: 50343859008**      Collected: 04/27/23 12:30      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>45900</b>	mg/kg	222	5	05/08/23 08:17	05/12/23 03:00	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	ND	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:39	7440-38-2	
Iron	ND	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:39	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>6.6</b>	mg/kg	1.0	10	05/06/23 05:45	05/09/23 20:11	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>4.8</b>	%	0.10	1		05/11/23 17:21		N2

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

**Sample: MW-106D-58-60**      **Lab ID: 50343859009**      Collected: 04/27/23 12:40      Received: 05/03/23 09:30      Matrix: Solid

*Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.*

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>6010 MET ICP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3050 Pace Analytical Services - Indianapolis								
Iron	<b>21600</b>	mg/kg	98.9	2	05/08/23 08:17	05/12/23 03:02	7439-89-6	
<b>6010 MET ICP, SPLP</b>								
Analytical Method: EPA 6010    Preparation Method: EPA 3010 Leachate Method/Date: EPA 1312; 05/06/23 16:45 Pace Analytical Services - Indianapolis								
Arsenic	ND	mg/L	0.010	1	05/10/23 09:44	05/11/23 03:41	7440-38-2	
Iron	<b>6.3</b>	mg/L	0.10	1	05/10/23 09:44	05/11/23 03:41	7439-89-6	
<b>6020 MET ICPMS</b>								
Analytical Method: EPA 6020    Preparation Method: EPA 3050B Pace Analytical Services - Indianapolis								
Arsenic	<b>1.5</b>	mg/kg	1.0	10	05/06/23 05:45	05/09/23 20:15	7440-38-2	
<b>Percent Moisture</b>								
Analytical Method: SM 2540G Pace Analytical Services - Indianapolis								
Percent Moisture	<b>4.7</b>	%	0.10	1		05/11/23 17:22		N2

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

QC Batch:	731743	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3050	Analysis Description:	6010 MET
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

METHOD BLANK: 3358199 Matrix: Solid

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Iron	mg/kg	ND	50.0	05/12/23 01:30	

LABORATORY CONTROL SAMPLE: 3358200

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron	mg/kg	500	534	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3358201 3358202

Parameter	Units	50343772002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	mg/kg	21400	628	571	27300	25400	948	706	75-125	7	20	E,P6

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**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

QC Batch:	732567	Analysis Method:	EPA 6010
QC Batch Method:	EPA 3010	Analysis Description:	6010 MET SPLP
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

METHOD BLANK: 3362123 Matrix: Water

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.010	05/11/23 03:04	
Iron	mg/L	ND	0.10	05/11/23 03:04	

LABORATORY CONTROL SAMPLE: 3362124

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	1	1.0	102	80-120	
Iron	mg/L	2.5	2.7	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3362125 3362126

Parameter	Units	50343859001		3362126		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Arsenic	mg/L	0.024	1	1	1.0	1.1	98	108	75-125	9	20		
Iron	mg/L	39.7	2.5	2.5	40.2	43.8	17	165	75-125	9	20	P6	

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**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

QC Batch:	731827	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3050B	Analysis Description:	6020 MET
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

METHOD BLANK: 3358765 Matrix: Solid

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004, 50343859005, 50343859006, 50343859007, 50343859008, 50343859009

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.10	05/09/23 18:01	

LABORATORY CONTROL SAMPLE: 3358766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/kg	4	3.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3358767 3358768

Parameter	Units	50343859001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	26.2	4.3	4.3	26.6	21.1	10	-119	75-125	23	20	P6,R1

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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QC Batch:	732019	Analysis Method:	SM 2540G
QC Batch Method:	SM 2540G	Analysis Description:	Dry Weight/Percent Moisture
		Laboratory:	Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859001, 50343859002, 50343859003, 50343859004

SAMPLE DUPLICATE: 3359634

Parameter	Units	50343309001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	16.3	16.5	1	5	N2

SAMPLE DUPLICATE: 3359635

Parameter	Units	50343313001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.8	13.3	4	5	N2

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

QC Batch: 732615

Analysis Method: SM 2540G

QC Batch Method: SM 2540G

Analysis Description: Dry Weight/Percent Moisture

Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859005, 50343859006, 50343859007

SAMPLE DUPLICATE: 3362251

Parameter	Units	50343383073 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	9.8	9.6	2	5	N2

SAMPLE DUPLICATE: 3362252

Parameter	Units	50343859007 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	20.2	19.9	2	5	N2

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**QUALITY CONTROL DATA**

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

QC Batch: 733024

Analysis Method: SM 2540G

QC Batch Method: SM 2540G

Analysis Description: Dry Weight/Percent Moisture

Laboratory: Pace Analytical Services - Indianapolis

Associated Lab Samples: 50343859008, 50343859009

SAMPLE DUPLICATE: 3364282

Parameter	Units	50343578001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	8.1	9.3	13	5	N2,R1

SAMPLE DUPLICATE: 3364283

Parameter	Units	50343859009 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.7	4.8	2	5	N2

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## QUALIFIERS

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

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### 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.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

N2 The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.

P6 Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: BREC Sebree Station Green CCR

Pace Project No.: 50343859

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
50343859001	MW-105-31-32	EPA 3050	731743	EPA 6010	733084
50343859002	MW-105-28-30	EPA 3050	731743	EPA 6010	733084
50343859003	MW-105-23-25	EPA 3050	731743	EPA 6010	733084
50343859004	MW-105-15-17	EPA 3050	731743	EPA 6010	733084
50343859005	MW-106S-22-24	EPA 3050	731743	EPA 6010	733084
50343859006	MW-106S-37-39	EPA 3050	731743	EPA 6010	733084
50343859007	Dup-1	EPA 3050	731743	EPA 6010	733084
50343859008	MW-106D-51-53	EPA 3050	731743	EPA 6010	733084
50343859009	MW-106D-58-60	EPA 3050	731743	EPA 6010	733084
50343859001	MW-105-31-32	EPA 3010	732567	EPA 6010	732819
50343859002	MW-105-28-30	EPA 3010	732567	EPA 6010	732819
50343859003	MW-105-23-25	EPA 3010	732567	EPA 6010	732819
50343859004	MW-105-15-17	EPA 3010	732567	EPA 6010	732819
50343859005	MW-106S-22-24	EPA 3010	732567	EPA 6010	732819
50343859006	MW-106S-37-39	EPA 3010	732567	EPA 6010	732819
50343859007	Dup-1	EPA 3010	732567	EPA 6010	732819
50343859008	MW-106D-51-53	EPA 3010	732567	EPA 6010	732819
50343859009	MW-106D-58-60	EPA 3010	732567	EPA 6010	732819
50343859001	MW-105-31-32	EPA 3050B	731827	EPA 6020	732132
50343859002	MW-105-28-30	EPA 3050B	731827	EPA 6020	732132
50343859003	MW-105-23-25	EPA 3050B	731827	EPA 6020	732132
50343859004	MW-105-15-17	EPA 3050B	731827	EPA 6020	732132
50343859005	MW-106S-22-24	EPA 3050B	731827	EPA 6020	732132
50343859006	MW-106S-37-39	EPA 3050B	731827	EPA 6020	732132
50343859007	Dup-1	EPA 3050B	731827	EPA 6020	732132
50343859008	MW-106D-51-53	EPA 3050B	731827	EPA 6020	732132
50343859009	MW-106D-58-60	EPA 3050B	731827	EPA 6020	732132
50343859001	MW-105-31-32	SM 2540G	732019		
50343859002	MW-105-28-30	SM 2540G	732019		
50343859003	MW-105-23-25	SM 2540G	732019		
50343859004	MW-105-15-17	SM 2540G	732019		
50343859005	MW-106S-22-24	SM 2540G	732615		
50343859006	MW-106S-37-39	SM 2540G	732615		
50343859007	Dup-1	SM 2540G	732615		
50343859008	MW-106D-51-53	SM 2540G	733024		
50343859009	MW-106D-58-60	SM 2540G	733024		

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Submitting a sample via this cha...

WO#: 50343859



50343859

DY / Analytical Request Document

3AL DOCUMENT. All relevant fields must be completed accurately. Terms and Conditions found at https://info.pacelabs.com/hubs/pas-standard-terms.pdf

Section A

Required Client Information:

Company	Burns & McDonnell
Address	9450 Ward Parkway
Kansas City, MO	64114
Email	choglund@burnsmcd.com
Phone	785-317-1747
Requested Due Date	Standard TAT

Required Project Information:

Report To	Hoglund, Chris
Copy To	
Purchase Order #	
Project Name	BREC Sebree Station Green CCR Landfill
Project #	156465

Invoice Information:

Attention	Accounts Payable
Company Name	Burns & McDonnell
Address	
Pace Quote	01242023
Pace Project Manager	kenneth.hunt@pacelabs.com
Pace Profile #	9106 Line 5

Regulatory Agency
State / Location
KY

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED				SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Analyses Test Metals As 6020 Fe 6010 SPLP Metals As, Fe	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)							
				DATE	TIME	DATE	TIME			Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other										
1	MW-105-31-32	SL	G	4/25/23	1700	---	---	2	X								X	X								-001	
2	MW-105-20-30	SL	G	4/15/23	1715	---	---	2	X								X	X								-002	
3	MW-105-23-25	SL	G	4/25/23	1720	---	---	2	Y								X	Y								-003	
4	MW-105-15-17	SL	G	4/25/23	1730	---	---	2	X								X	Y								-004	
5	MW-106S-22-24	SL	G	4/16/23	1345	---	---	2	X								X	Y								-005	
6	MW-106S-37-39	SL	G	4/16/23	1355	---	---	2	X								X	Y								-006	
7	DUP-1	SL	G	4/16/23	-	---	---	2	Y								X	X								-007	
8	MW-106D-51-53	SL	G	4/27/23	1230	---	---	2	Y								Y	Y								008	
9	MW-106D-58-60	SL	G	4/27/23	1240	---	---	2	Y								X	X								009	
10																											
11																											
12																											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Josh Frasher (BMcD)	5/1/23	1500	Jed Eng	5/3/23	0930	3.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed (Y/N)	Cooler Used (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	SIGNATURE of SAMPLER:					
Josh Frasher	<i>[Signature]</i>					



**SAMPLE CONDITION UPON RECEIPT FORM**

Date/Time and Initials of person examining contents: 05/04/23 0915 JF

1. Courier:  FED EX  UPS  CLIENT  PACE  USPS  OTHER

2. Custody Seal on Cooler/Box Present:  Yes  No

(If yes) Seals Intact:  Yes  No (leave blank if no seals were present)

3. Thermometer: 1 2 3 4 5 6 A B C D E F

4. Cooler Temperature(s): 2.9/30     
 (Initial/Corrected) RECORD TEMPS OF ALL COOLERS RECEIVED (use Comments below to add more)

5. Packing Material:  Bubble Wrap  Bubble Bags  
 None  Other

6. Ice Type:  Wet  Blue  None

7. If temp. is over 6°C or under 0°C, was the PM notified?:  Yes  No  
 Cooler temp should be above freezing to 6°C

All discrepancies will be written out in the comments section below.

	Yes	No		Yes	No	N/A
USDA Regulated Soils? (HI, ID, NY, WA, OR, CA, NM, TX, OK, AR, LA, TN, AL, MS, NC, SC, GA, FL, or Puerto Rico)		<input checked="" type="checkbox"/>	All containers needing acid/base preservation have been pH CHECKED? Exceptions: VOA, coliform, LLHg, O&G, RAD CHEM, and any container with a septum cap or preserved with HCl.			<input checked="" type="checkbox"/>
Short Hold Time Analysis (48 hours or less)? Analysis:		<input checked="" type="checkbox"/>	Circle: HNO3 (<2) H2SO4 (<2) NaOH (>10) NaOH/ZnAc (>9) Any non-conformance to pH recommendations will be noted on the container count form			<input checked="" type="checkbox"/>
Time 5035A TC placed in Freezer or Short Holds To Lab	Time:		Residual Chlorine Check (SVOC 625 Pest/PCB 608)	<u>Present</u>	<u>Absent</u>	<u>N/A</u>
Rush TAT Requested (4 days or less):		<input checked="" type="checkbox"/>	Residual Chlorine Check (Total/Amenable/Free Cyanide)			<input checked="" type="checkbox"/>
Custody Signatures Present?	<input checked="" type="checkbox"/>		Headspace Wisconsin Sulfide?			<input checked="" type="checkbox"/>
Containers Intact?	<input checked="" type="checkbox"/>		Headspace in VOA Vials (>6mm): See Container Count form for details	<u>Present</u>	<u>Absent</u>	<u>No VOA Vials Sent</u>
Sample Label (IDs/Dates/Times) Match COC? Except TCs, which only require sample ID	<input checked="" type="checkbox"/>		Trip Blank Present?		<input checked="" type="checkbox"/>	
Extra labels on Terracore Vials? (soils only)		<input checked="" type="checkbox"/>	Trip Blank Custody Seals?			<input checked="" type="checkbox"/>

COMMENTS:

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\*\* Place a RED dot on containers that are out of performance \*\*

COC Line Item	WGFU	VIALS						AMBER GLASS						PLASTIC						OTHER					Matrix																										
		MeOH (only)		VOA VIAL HS (>6mm)	DG9H	VG9H	VG9U	DG9U	VG9T	AG0U	AG1H	AG1U	AG2U	AG3S	AG3SF	AG3C	BP1U	BP1N	BP2U	BP3U	BP3N	BP3F	BP3S	BP3B		BP3Z	CG3H	CG3F	Syringe Kit	WGC/KU																					
		R	SBS																												Nitric	Sulfuric	Sodium Hydroxide	Sodium Hydroxide/ZnAc																	
1																																																			
2																																																			
3																																																			
4																																																			
5																																																			
6																																																			
7																																																			
8																																																			
9																																																			
10																																																			
11																																																			
12																																																			

Container Codes

Glass

VG9H	40mL HCl amber vial	BG1T	1L Na Thiosulfate clear glass
VG9P	40mL TSP amber vial	BG1U	1L unpreserved glass
VG9S	40mL H2SO4 amber vial	BG3H	250mL HCl Clear Glass
VG9T	40mL Na Thio amber vial	BG3U	250mL Unpres Clear Glass
VG9U	40mL unpreserved amber vial	AG0U	100ml unpres amber glass
GGH	40mL HCl clear vial	AG1H	1L HCl amber glass
GGT	40mL Na Thio. clear vial	AG1S	1L H2SO4 amber glass
GGU	40mL unpreserved clear vial	AG1T	1L Na Thiosulfate amber glass
GU	40mL w/hexane wipe vial	AG1U	1liter unpres amber glass
UGKJ	8oz unpreserved clear jar	AG2N	500mL HNO3 amber glass
UGFU	4oz clear soil jar	AG2S	500mL H2SO4 amber glass
GFU	4oz unpreserved amber wide	AG2U	500mL unpres amber glass
GGH	250ml. clear glass HCl	AG3S	250mL H2SO4 amber glass
GGF	250mL clear glass HCl, Field Filter	AG3SF	250mL H2SO4 amb glass .field filtered
GGH	1L HCl clear glass	AG3U	250mL unpres amber glass
GGS	1L H2SO4 clear glass	AG3C	250mL NaOH amber glass

Plastic

BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
Miscellaneous	
Syringe Kit	LL Cr+6 sampling kit
ZPLC	Ziploc Bag
R	Terracore Kit
SP5T	120mL Coliform Sodium Thiosulfate
GN	General Container
U	Summa Can (air sample)
WT	Water
SL	Solid Solid
OL	Oil
NAL	Non-aqueous liquid
WP	Wipe

**XRF SCREENING LOG**

pg. 1 of 2

Project Name:	MW-2 Characterization	XRF Screening Date:	7/20/2023
Site Location:	BREC Green Landfill	XRF Screener Name:	Eric Brown
Property ID:	N/A	Project Number:	156465

Sample ID <del>XRF Screening ID</del>	Sample Depth (ft bgs)	XRF Result	Accuracy Info	Time	Screening Method	Additional Notes XRF ID
MW-						
MW-105-28-30	28'-30'	Fe 1.45% As ND	±0.1% <8	1631		07/20/23 <del>#1</del> #3
		Fe 1.51% As ND	±0.1% <8	1633		07/20/23 #4
MW-105-23-25	23'-25'	Fe 2.22% As ND	±0.1% <7	1635		07/20/23 #5
		Fe 2.41% As 10	±0.1% 3	1636		07/20/23 #6
MW-105-15-17	15'-17'	Fe 2.00% As ND	±0.1% <8	1637		07/20/23 #7
		Fe 2.24% As 8	±0.1% 3	1638		07/20/23 #8
MW-105-31-32	31'-32'	Fe 1.80% As 8	±0.1% 2	1640		07/20/23 #9
		Fe 2.16% As ND	±0.1% <8	1641		07/20/23 #10
MW-106D-51-53	51'-53'	Fe 4.31% As 13	0.07% 4	1642		07/20/23 #11
		Fe 5.30% As 14	0.07% 4	1644		07/20/23 #12




XRF Screening ID	Sample Depth (ft bgs)	XRF Result	Accuracy Info	Time	Screening Method	Additional Notes
MW-106D-58-60	58'-60'	Fe 1.80% AS ND	±0.1% 10	1645		07/20/23 #13
		Fe 2.46% AS ND	±0.1% <8	1647		07/20/23 #18
MW-106S-37-39	37'-39'	Fe 2.30% AS ND	0.1% <7	1648		07/20/23 #19
		Fe 1.84% AS ND	0.1% <9	1649		07/20/23 #20
MW-106S-22-24	22'-24'	Fe 1.34% AS ND	0.1% <6	1651		07/20/23 #23
		Fe 2.18% AS ND	0.1% <8	1652		07/20/23 #24
DUP-1 MW-106S	22'-24'	Fe 1.81% AS ND	0.1% <7	1653		07/20/23 #25
		Fe 1.78% AS 8	0.1% 2	1655		07/20/23 #26



# Test Report

Client:	Burns & McDonnell Engineering	MI#:	23125
Project:	N/A	Date:	07/25/23
Location:	N/A	P.O.#:	156465

<b>Client</b>	Burns & McDonnell Engineering		
	9400 Ward Parkway		
	Kansas City, MO 64114		
	Attn: Chris Hoglund		
<b>Email</b>	<a href="mailto:choglund@burnsmcd.com">choglund@burnsmcd.com</a>	<b>Phone</b>	816.333.9400

Method(s)	Timothy B. Murphy
X-ray Diffraction (Bulk & Clay)	

- [Conditions & Qualifications](#)
- [Summary](#)
- [Table I.1](#)
- [Table I.2](#)



## **CONDITIONS AND QUALIFICATIONS**

*Mineralogy, Inc. will endeavor to provide accurate and reliable laboratory measurements of the samples provided by the client. The results of any x-ray diffraction, petrographic or core analysis test are necessarily influenced by the condition and selection of the samples to be analyzed. It should be recognized that geological samples are commonly heterogeneous and lack uniform properties. Mineralogical, geochemical and/or petrographic data obtained for a specific sample provides compositional data pertinent to that specific sampling location. Such “site-specific data” may fail to provide adequate characterization of the range of compositional variability possible within a given project area, thus the “projection” of these laboratory findings and values to adjoining, “untested” areas of the formation or project area is inherently risky, and exceeds the scope of the laboratory work request. Hence, Mineralogy, Inc. shall not assume any liability risk or responsibility for any loss or potential failure associated with the application of “site or sample-specific laboratory data” to “untested” areas of the formation or project area. Unless otherwise directed, the samples selected for analysis will be chosen to reflect a visually representative portion of the bulk sample submitted for analysis. Where provided, the interpretation of x-ray diffraction, petrographic or core analysis results constitutes the best geological judgment of Mineralogy, Inc., and is subject to the sampling limitations described above, and the detection limits inherent to semi-quantitative and/or qualitative mineralogical and microscopic analysis. Mineralogy, Inc. assumes no responsibility nor offers any guarantee of the productivity, suitability or performance of any oil or gas well, hydrocarbon recovery process, dimension stone, and/or ore material based upon the data or conclusions presented in this report.*

*This report is to only be replicated in its entirety.*

*Sample Retention: Samples will be stored for a period of 30 days and thereafter discarded. If additional sample storage time and/or return shipping is required, appropriate charges will be billed to the client.*



## Summary

Two of four unconsolidated sediment intervals from the MW-105 well [31-32' (23125-01) & 15-17' (23125-04)] exhibit concentrations of iron-rich secondary (?) mineralization. The interval at 31-32' contains large amounts (~8.5%) of goethite ( $\alpha\text{-FeOOH}$ ) + minor amounts (~0.5%) of iron carbonate cement (siderite). Minor amounts (~0.5%) of siderite cement were also identified in the sediment interval from 15-17'. Goethite is a common microcrystalline corrosion product within sediments containing concentrations of iron-rich mineralization. The abundance of goethite in this interval is likely to promote the diffusion of soluble iron into ground water solutions. The XRD mineral assemblage noted for the MW-105 sediments lacks evidence of a direct mineralogical source for arsenic.

Both sediment intervals from the MW-106D well [51-53' (23125-07), and 58-60' (23125-08)] contain moderate concentrations (~2-3%) of siderite cement ( $\text{FeCO}_3$ ). Moderate amounts of halite (~2-5%) are also present within these sediment intervals. The localized crystallization of the siderite is consistent with the presence of significant amounts of iron in solution within this portion of the aquifer. The XRD mineral assemblages noted for the MW-106S & MW-106D sediments lack evidence of a direct mineralogical source for arsenic.

Standard-less, whole-rock x-ray diffraction mineralogical analysis is an effective lab method for surveying the bulk mineralogical properties for geologic specimens. The analytical precision for the XRD lab method is approximated at +/- 3-5%. The XRD lab method lacks the sensitivity required to reliably identify & quantify accessory or trace amounts of metallic mineral constituents (e.g., As). ICP-MS will likely be required to identify specific sediment intervals containing relatively elevated levels of As. SEM analysis with spectral imaging can be subsequently utilized to identify & analyze specific trace mineralogical sources for As within targeted sediment intervals.





## X-ray Diffraction

Table I.1

Client:	Burns & McDonnell Engineering	MI#:	23125
Project:	N/A	P.O.#:	156465
Location:	N/A	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23125-01	23125-02	23125-03	23125-04
	Sample ID:	MW-105-31-32	MW-105-28-30	MW-105-23-25	MW-105-15-17
	Depth (ft):	31-32	28-30	23-25	15-17
	Chemical Formula	Relative Abundance (%)			
Quartz	SiO <sub>2</sub>	19	47	45	43
Plagioclase Feldspar	(Na,Ca)AlSi <sub>3</sub> O <sub>8</sub>	11	11	6	8
K-Feldspar	KAlSi <sub>3</sub> O <sub>8</sub>	5	4	4	4
Calcite	CaCO <sub>3</sub>				2
Dolomite	(Ca,Mg)(CO <sub>3</sub> ) <sub>2</sub>		1.5		3.5
Siderite	FeCO <sub>3</sub>	0.5			0.5
Goethite	alpha-FeOOH	8.5			
Kaolinite	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub>	19	2	2	3
Chlorite	(Mg,Al) <sub>6</sub> (Si,Al) <sub>4</sub> O <sub>10</sub> (OH) <sub>8</sub>	1	1	1	1
Illite / Mica	KAl <sub>2</sub> (Si <sub>3</sub> AlO <sub>10</sub> )(OH) <sub>2</sub>	21	24	17	27
Mixed-Layered Illite/Smectite	K <sub>0.5</sub> Al <sub>2</sub> (Si,Al) <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub> • 2H <sub>2</sub> O	15	9.5	25	8
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
% Illite in ML I/S		80%	70%	70%	75%



## X-ray Diffraction

Table I.2

Client:	Burns & McDonnell Engineering	MI#:	23125
Project:	N/A	P.O.#:	156465
Location:	N/A	Method:	X-ray Diffraction

Mineral Constituent	Lab ID:	23125-05	23125-06	23125-07	23125-08
	Sample ID:	MW-106S-22-24	MW-106S-37-39	MW-106D-51-53	MW-106D-58-60
	Depth (ft):	22-24	37-39	51-53	58-60
	Chemical Formula	Relative Abundance (%)			
Quartz	SiO <sub>2</sub>	50	60	19	42
Plagioclase Feldspar	(Na,Ca)AlSi <sub>3</sub> O <sub>8</sub>	6	14	10	20
K-Feldspar	KAlSi <sub>3</sub> O <sub>8</sub>	4	3.5	3	7
Calcite	CaCO <sub>3</sub>				0.5
Halite	NaCl			5	2
Siderite	FeCO <sub>3</sub>			3	2
Kaolinite	Al <sub>2</sub> Si <sub>2</sub> O <sub>5</sub> (OH) <sub>4</sub>	3	5	13	13
Chlorite	(Mg,Al) <sub>6</sub> (Si,Al) <sub>4</sub> O <sub>10</sub> (OH) <sub>8</sub>	1	1.5	12	1.5
Illite / Mica	KAl <sub>2</sub> (Si <sub>3</sub> AlO <sub>10</sub> )(OH) <sub>2</sub>	10	13	30	9
Mixed-Layered Illite/Smectite	K <sub>0.5</sub> Al <sub>2</sub> (Si,Al) <sub>4</sub> O <sub>10</sub> (OH) <sub>2</sub> • 2H <sub>2</sub> O	26	3	5	3
<b>Total</b>		<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
% Illite in ML I/S		50%	75%	85%	70%



## Certificate of Analysis 3111624

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 12/11/2023 15:53

Project Name: Green Landfill Semiannual Groundwater	Workorder: 3111624
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Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/08/2023 14:20.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3111624-01	MW1/	Groundwater	11/07/2023 15:55	11/08/2023 14:20	Eric Brown
3111624-02	MW2/	Groundwater	11/07/2023 15:00	11/08/2023 14:20	Eric Brown
3111624-03	MW3A/	Groundwater	11/08/2023 10:10	11/08/2023 14:20	Eric Brown
3111624-04	MW4/	Groundwater	11/07/2023 10:25	11/08/2023 14:20	Eric Brown
3111624-05	MW5/	Groundwater	11/07/2023 08:45	11/08/2023 14:20	Eric Brown
3111624-06	MW6/	Groundwater	11/08/2023 09:05	11/08/2023 14:20	Eric Brown
3111624-07	DUPLICATE/	Groundwater	11/08/2023 10:30	11/08/2023 14:20	Eric Brown
3111624-08	FIELD BLANK/	Water	11/08/2023 09:15	11/08/2023 14:20	Eric Brown

LabNumber	Measurement	Value
3111624-01	Field Conductance	564
	Field pH	6.78
	Field Temp (C)	17.26
3111624-02	Field Conductance	1100
	Field pH	6.46
	Field Temp (C)	16.71
3111624-03	Field Conductance	4390
	Field pH	6.48
	Field Temp (C)	16.62
3111624-04	Field Conductance	3480
	Field pH	6.32
	Field Temp (C)	17.94
3111624-05	Field Conductance	3440
	Field pH	6.36
	Field Temp (C)	16.10
3111624-06	Field Conductance	2990
	Field pH	6.34
	Field Temp (C)	17.37



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-01**  
 Description: **MW1**

Sample Collection Date Time: 11/07/2023 15:55  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Arsenic</b>	<b>0.0016</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Barium</b>	<b>0.079</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Boron</b>	<b>1.65</b>	D1	mg/L	1.00	1.00	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:20	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Calcium</b>	<b>25.2</b>	D1	mg/L	4.00	1.30	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:20	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Iron</b>	<b>1.51</b>	M2	mg/L	0.100	0.050	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:12	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB
<b>Sodium</b>	<b>206</b>	D1, M2	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:15	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:03	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>9</b>	J	mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>978</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.94</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>684</b>		mg/L	50	50	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>1.1</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 10:09	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.072</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.104</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.176</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.176</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>5.7</b>		mg/L	0.5	0.4	SW846 9056	11/10/2023 21:54	11/10/2023 21:54	CSC
<b>Fluoride</b>	<b>0.6</b>		mg/L	0.2	0.2	SW846 9056	11/10/2023 21:54	11/10/2023 21:54	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>30</b>		mg/L	1	0.5	SW846 9056	11/10/2023 21:54	11/10/2023 21:54	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-02**  
 Description: **MW2**

Sample Collection Date Time: 11/07/2023 15:00  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Arsenic</b>	<b>0.0283</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Barium</b>	<b>0.270</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:26	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Calcium</b>	<b>179</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:42	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Iron</b>	<b>17.1</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:19	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Lithium</b>	<b>0.005</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB
<b>Sodium</b>	<b>56.2</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:19	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:07	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>20</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>1670</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.23</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>1060</b>		mg/L	100	100	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>1.6</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 10:31	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>-0.396</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.001</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.001</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.001</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>185</b>	D	mg/L	1.0	0.7	SW846 9056	11/10/2023 22:49	11/10/2023 22:49	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	11/10/2023 22:22	11/10/2023 22:22	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>159</b>		mg/L	1	0.5	SW846 9056	11/10/2023 22:22	11/10/2023 22:22	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-03**  
 Description: **MW3A**

Sample Collection Date Time: 11/08/2023 10:10  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:10	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Barium</b>	<b>0.038</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Boron</b>	<b>0.31</b>		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:45	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Calcium</b>	<b>475</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:52	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Iron</b>	<b>0.185</b>		mg/L	0.100	0.050	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:25	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Lithium</b>	<b>0.71</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB
<b>Sodium</b>	<b>301</b>	D1	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/21/2023 14:48	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:10	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>105</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>6700</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.37</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>3630</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>0.6</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 12:38	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>1.00</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>1.45</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>2.45</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>2.45</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1190</b>	D	mg/L	20.0	14.4	SW846 9056	11/14/2023 03:55	11/14/2023 03:55	CSC
<b>Fluoride</b>	<b>0.4</b>		mg/L	0.2	0.2	SW846 9056	11/10/2023 23:16	11/10/2023 23:16	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>2530</b>	D	mg/L	20	10	SW846 9056	11/11/2023 00:11	11/11/2023 00:11	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-04**  
 Description: **MW4**

Sample Collection Date Time: 11/07/2023 10:25  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:14	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Barium</b>	<b>0.020</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Boron</b>	<b>0.81</b>		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:55	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Calcium</b>	<b>702</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:01	MRWD
<b>Chromium</b>	<b>0.0008</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
Iron	ND	B, u	mg/L	0.100	0.050	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:55	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Lithium</b>	<b>0.99</b>	D1	mg/L	0.20	0.05	SW846-6020 A	11/10/2023 09:07	11/14/2023 14:34	AKB
<b>Mercury</b>	<b>0.0004</b>	J	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Selenium</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB
<b>Sodium</b>	<b>240</b>	D2	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:41	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:14	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>89</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>5710</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.16</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>4080</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 12:59	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.00	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	1.32	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>1.32</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	1.32	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>1090</b>	D	mg/L	10.0	7.2	SW846 9056	11/14/2023 04:22	11/14/2023 04:22	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	11/11/2023 00:39	11/11/2023 00:39	CSC
<b>Sulfate</b>	<b>1890</b>	D	mg/L	10	5	SW846 9056	11/11/2023 01:34	11/11/2023 01:34	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-05**  
 Description: **MW5**

Sample Collection Date Time: 11/07/2023 08:45  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:18	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Barium</b>	<b>0.011</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Boron</b>	<b>0.21</b>		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:04	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Calcium</b>	<b>439</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:20	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Iron	ND	B, u	mg/L	0.100	0.050	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:04	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Lithium</b>	<b>0.36</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Mercury</b>	<b>0.0002</b>	J	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB
<b>Sodium</b>	<b>197</b>	D2	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:44	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:18	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>75</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>6000</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.25</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>4650</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>	Y1	mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 13:21	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.00	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	1.12	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>1.12</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	1.12	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>992</b>	D	mg/L	10.0	7.2	SW846 9056	11/14/2023 04:50	11/14/2023 04:50	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	11/11/2023 02:56	11/11/2023 02:56	CSC
<b>Sulfate</b>	<b>2390</b>	D	mg/L	10	5	SW846 9056	11/11/2023 03:23	11/11/2023 03:23	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-06**  
 Description: **MW6**

Sample Collection Date Time: 11/08/2023 09:05  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:21	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
<b>Barium</b>	<b>0.009</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
<b>Boron</b>	<b>0.15</b>	M2	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:23	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
<b>Calcium</b>	<b>375</b>	D1, M3	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:30	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Iron	ND	B, u	mg/L	0.100	0.050	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:23	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB
<b>Sodium</b>	<b>424</b>	D2	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:47	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:21	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>18</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>5120</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.42</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>4030</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>2.4</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 13:42	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.220</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>-0.005</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.220</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.220</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>192</b>	D, M3	mg/L	2.5	1.8	SW846 9056	11/11/2023 04:18	11/11/2023 04:18	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	11/11/2023 03:51	11/11/2023 03:51	CSC



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>8480</b>	D, M3	mg/L	50	25	SW846 9056	11/14/2023 16:40	11/14/2023 16:40	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-07**  
 Description: **DUPLICATE**

Sample Collection Date Time: 11/08/2023 10:30  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:25	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
<b>Barium</b>	<b>0.039</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
<b>Boron</b>	<b>0.30</b>		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:33	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
<b>Calcium</b>	<b>471</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:39	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Iron	ND	B, u	mg/L	0.100	0.050	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:33	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
<b>Lithium</b>	<b>0.74</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB
<b>Sodium</b>	<b>331</b>	D2	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:50	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:25	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>110</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>7440</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>7.25</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
<b>Total Dissolved Solids</b>	<b>5290</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>0.7</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 14:03	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>-0.068</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.477</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.477</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.477</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>3090</b>	D	mg/L	25.0	18.0	SW846 9056	11/17/2023 22:54	11/17/2023 22:54	CSC
<b>Fluoride</b>	<b>0.4</b>		mg/L	0.2	0.2	SW846 9056	11/11/2023 05:13	11/11/2023 05:13	CSC



**Pace Analytical Services, LLC**

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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Sulfate</b>	<b>1490</b>	D	mg/L	20	10	SW846 9056	11/14/2023 05:44	11/14/2023 05:44	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111624-08**  
 Description: **FIELD BLANK**

Sample Collection Date Time: 11/08/2023 09:15  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:29	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Barium	ND	u	mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:42	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:42	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Iron	ND	B, u	mg/L	0.100	0.050	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:42	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB
Sodium	ND	u	mg/L	0.26	0.10	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:54	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:29	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	u	mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>1</b>		umhos/cm	1	1	2510 B-2011	11/09/2023 09:01	11/09/2023 13:45	AED
<b>pH (Lab)</b>	<b>5.83</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	ND	G1, u	mg/L	50	50	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
Total Organic Carbon	ND	u	mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 14:24	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.00	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report Radium</b>	<b>0.520</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
	<b>0.520</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.520</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	0.6		mg/L	0.5	0.4	SW846 9056	11/11/2023 06:08	11/11/2023 06:08	CSC
Fluoride	ND	u	mg/L	0.2	0.2	SW846 9056	11/11/2023 06:08	11/11/2023 06:08	CSC
Sulfate	0.6	J	mg/L	1	0.5	SW846 9056	11/11/2023 06:08	11/11/2023 06:08	CSC



**Notes for work order 3111624**

- 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.
- B Target analyte detected in method blank at or above the method reporting limit.
- D Results reported from dilution.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- G1 Residue yield was less than the method required 2.5mg.
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- J5 Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
- L2 The associated blank spike recovery was below method acceptance limits.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

- 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





**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
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**Batch BCK0852 - EPA 200.2**

**Blank (BCK0852-BLK1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:34

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
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**Blank (BCK0852-BLK2)**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:01

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	0.658	0.100	mg/L							B
Sodium	ND	0.26	mg/L							U

**Blank (BCK0852-BLK3)**

Prepared: 11/10/2023 9:07, Analyzed: 11/16/2023 11:16

Iron	0.720	0.100	mg/L							B
Sodium	ND	0.26	mg/L							U

**LCS (BCK0852-BS1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:37

Antimony	0.061	0.005	mg/L	0.0625		98.0	85-115			
Molybdenum	0.06	0.01	mg/L	0.0625		98.5	85-115			
Mercury	0.0024	0.0005	mg/L	0.00250		94.4	85-115			
Arsenic	0.0605	0.0010	mg/L	0.0625		96.9	85-115			
Barium	0.060	0.004	mg/L	0.0625		95.3	85-115			
Beryllium	0.0580	0.0020	mg/L	0.0625		92.8	85-115			
Cadmium	0.0590	0.0010	mg/L	0.0625		94.4	85-115			
Chromium	0.0613	0.0020	mg/L	0.0625		98.1	85-115			
Cobalt	0.060	0.004	mg/L	0.0625		96.2	85-115			
Copper	0.060	0.003	mg/L	0.0625		95.7	85-115			
Lead	0.056	0.002	mg/L	0.0625		89.1	85-115			
Lithium	0.06	0.02	mg/L	0.0625		91.3	85-115			
Selenium	0.060	0.003	mg/L	0.0625		95.7	85-115			
Thallium	0.0576	0.0020	mg/L	0.0625		92.2	85-115			



**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
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**Batch BCK0852 - EPA 200.2**

**LCS (BCK0852-BS2)**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:04

Boron	0.11	0.10	mg/L	0.125		88.9	85-115			
Calcium	5.71	0.40	mg/L	6.25		91.4	85-115			
Iron	5.50	0.100	mg/L	6.25		88.0	85-115			B
Sodium	4.80	0.26	mg/L	6.25		76.8	85-115			L2

**LCS (BCK0852-BS3)**

Prepared: 11/10/2023 9:07, Analyzed: 11/16/2023 11:19

Iron	6.00	0.100	mg/L	6.25		95.9	85-115			B
Sodium	5.18	0.26	mg/L	6.25		82.9	85-115			L2

**Matrix Spike (BCK0852-MS1)**

Source: 3111623-01

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:01

Mercury	0.0023	0.0005	mg/L	0.00250	ND	91.3	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	101	80-120			
Antimony	0.065	0.005	mg/L	0.0625	ND	103	80-120			
Arsenic	0.0637	0.0010	mg/L	0.0625	ND	102	80-120			
Barium	0.097	0.004	mg/L	0.0625	0.037	95.1	80-120			
Beryllium	0.0580	0.0020	mg/L	0.0625	ND	92.9	80-120			
Cadmium	0.0588	0.0010	mg/L	0.0625	ND	94.1	80-120			
Chromium	0.0602	0.0020	mg/L	0.0625	ND	96.3	80-120			
Cobalt	0.058	0.004	mg/L	0.0625	ND	92.3	80-120			
Copper	0.055	0.003	mg/L	0.0625	ND	88.3	80-120			
Lead	0.054	0.002	mg/L	0.0625	ND	85.7	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	86.6	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	101	80-120			
Thallium	0.0554	0.0020	mg/L	0.0625	ND	88.6	80-120			

**Matrix Spike (BCK0852-MS2)**

Source: 3111624-06

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:09

Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	94.4	80-120			
Arsenic	0.0652	0.0010	mg/L	0.0625	ND	104	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.009	96.0	80-120			
Beryllium	0.0568	0.0020	mg/L	0.0625	ND	91.0	80-120			
Cadmium	0.0573	0.0010	mg/L	0.0625	ND	91.7	80-120			
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120			
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.4	80-120			
Lead	0.053	0.002	mg/L	0.0625	ND	84.8	80-120			
Lithium	0.10	0.02	mg/L	0.0625	0.04	89.2	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	111	80-120			
Thallium	0.0551	0.0020	mg/L	0.0625	ND	88.2	80-120			



**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
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**Batch BCK0852 - EPA 200.2**

**Matrix Spike (BCK0852-MS3) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:33

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	226	4.00	mg/L	6.25	221	81.5	80-120			D2
Iron	8.11	1.00	mg/L	6.25	2.26	93.6	80-120			D2, B
Sodium	876	2.60	mg/L	6.25	895	NR	80-120			D2, M3

**Matrix Spike (BCK0852-MS4) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:39

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	377	4.00	mg/L	6.25	375	24.5	80-120			D2, M3
Iron	5.83	1.00	mg/L	6.25	ND	93.4	80-120			D2, B
Sodium	351	2.60	mg/L	6.25	351	NR	80-120			D2, M3

**Matrix Spike Dup (BCK0852-MSD1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:05

Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	2.41	20	
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.7	80-120	1.53	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	100	80-120	0.770	20	
Arsenic	0.0626	0.0010	mg/L	0.0625	ND	100	80-120	1.81	20	
Barium	0.096	0.004	mg/L	0.0625	0.037	93.4	80-120	1.13	20	
Beryllium	0.0582	0.0020	mg/L	0.0625	ND	93.1	80-120	0.231	20	
Cadmium	0.0578	0.0010	mg/L	0.0625	ND	92.5	80-120	1.74	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.4	80-120	0.955	20	
Cobalt	0.057	0.004	mg/L	0.0625	ND	90.8	80-120	1.64	20	
Copper	0.054	0.003	mg/L	0.0625	ND	86.6	80-120	1.94	20	
Lead	0.053	0.002	mg/L	0.0625	ND	84.3	80-120	1.71	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	86.3	80-120	0.238	20	
Selenium	0.063	0.003	mg/L	0.0625	ND	101	80-120	0.368	20	
Thallium	0.0544	0.0020	mg/L	0.0625	ND	87.0	80-120	1.83	20	

**Matrix Spike Dup (BCK0852-MSD2) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:12

Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	0.478	20	
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120	5.07	20	J5
Mercury	0.0025	0.0005	mg/L	0.00250	ND	98.5	80-120	4.18	20	J5
Arsenic	0.0662	0.0010	mg/L	0.0625	ND	106	80-120	1.49	20	
Barium	0.071	0.004	mg/L	0.0625	0.009	98.1	80-120	1.86	20	J5
Beryllium	0.0583	0.0020	mg/L	0.0625	ND	93.3	80-120	2.56	20	
Cadmium	0.0597	0.0010	mg/L	0.0625	ND	95.5	80-120	4.07	20	J5
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120	0.0251	20	
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.9	80-120	0.825	20	
Copper	0.057	0.003	mg/L	0.0625	ND	91.6	80-120	1.34	20	
Lead	0.055	0.002	mg/L	0.0625	ND	87.6	80-120	3.24	20	J5
Lithium	0.10	0.02	mg/L	0.0625	0.04	94.3	80-120	3.10	20	
Selenium	0.069	0.003	mg/L	0.0625	ND	110	80-120	0.900	20	
Thallium	0.0567	0.0020	mg/L	0.0625	ND	90.7	80-120	2.82	20	J5



**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
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**Batch BCK0852 - EPA 200.2**

**Matrix Spike Dup (BCK0852-MSD3) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:36

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	220	4.00	mg/L	6.25	221	NR	80-120	2.58	20	D2, M3
Iron	8.02	1.00	mg/L	6.25	2.26	92.2	80-120	1.07	20	D2, B
Sodium	853	2.60	mg/L	6.25	895	NR	80-120	2.61	20	D2, M3

**Matrix Spike Dup (BCK0852-MSD4) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:43

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	374	4.00	mg/L	6.25	375	NR	80-120	0.676	20	D2, M3
Iron	5.80	1.00	mg/L	6.25	ND	92.9	80-120	0.507	20	D2, B
Sodium	349	2.60	mg/L	6.25	351	NR	80-120	0.649	20	D2, M3

**Post Spike (BCK0852-PS1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:16

Antimony	0.068	0.005	mg/L	0.0625	ND	109	75-125			J5
Molybdenum	0.06	0.01	mg/L	0.0625	ND	101	75-125			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	96.7	75-125			J5
Arsenic	0.0632	0.0010	mg/L	0.0625	ND	101	75-125			
Barium	0.102	0.004	mg/L	0.0625	0.037	104	75-125			J5
Beryllium	0.0625	0.0020	mg/L	0.0625	ND	100	75-125			
Cadmium	0.0617	0.0010	mg/L	0.0625	ND	98.7	75-125			J5
Chromium	0.0590	0.0020	mg/L	0.0625	ND	94.4	75-125			
Cobalt	0.056	0.004	mg/L	0.0625	ND	90.4	75-125			
Copper	0.054	0.003	mg/L	0.0625	ND	87.0	75-125			
Lead	0.057	0.002	mg/L	0.0625	ND	90.6	75-115			J5
Lithium	0.10	0.02	mg/L	0.0625	0.04	102	75-125			
Selenium	0.063	0.003	mg/L	0.0625	ND	101	75-125			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	75-125			J5

**Post Spike (BCK0852-PS2) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:46

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	230	4.00	mg/L	6.25	221	149	75-125			D2
Iron	8.16	1.00	mg/L	6.25	2.26	94.3	75-125			D2, B
Sodium	891	2.60	mg/L	6.25	895	NR	75-125			D2, M3



**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
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**Batch BCK1517 - EPA 200.2**

**Blank (BCK1517-BLK1)**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 13:03

Iron	ND	0.100	mg/L							U
Sodium	ND	0.26	mg/L							U

**LCS (BCK1517-BS1)**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 13:06

Iron	6.47	0.100	mg/L	6.25		104	85-115			
Sodium	6.06	0.26	mg/L	6.25		96.9	85-115			

**Matrix Spike (BCK1517-MS1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:03

Iron	7.53	10.0	mg/L	6.25	ND	121	80-120			D2, M2, J
Sodium	196	26.0	mg/L	6.25	206	NR	80-120			D2, M2

**Matrix Spike Dup (BCK1517-MSD1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:06

Iron	7.72	10.0	mg/L	6.25	ND	124	80-120	2.45	20	D2, M2, J
Sodium	199	26.0	mg/L	6.25	206	NR	80-120	1.12	20	D2

**Post Spike (BCK1517-PS1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:19

Iron	7.22	10.0	mg/L	6.25	ND	115	75-125			D2, J
Sodium	183	26.0	mg/L	6.25	206	NR	75-125			D2, M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCK0601 - Default Prep Micro</b>										
<b>LCS (BCK0601-BS1)</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	4.95		Std. Units	5.00		99.0	98.8-101.2			
<b>LCS (BCK0601-BS2)</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	5.09		Std. Units	5.00		102	98.8-101.2			H3
<b>Duplicate (BCK0601-DUP1) Source: 3111624-06</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	7.42	0.10	Std. Units		7.42			0.00	10	H3
<b>Duplicate (BCK0601-DUP2) Source: 3111623-01</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	7.62	0.10	Std. Units		7.60			0.263	10	H3
<b>Batch BCK0621 - Default Prep Micro</b>										
<b>Blank (BCK0621-BLK1)</b>										
Prepared: 11/9/2023 9:01, Analyzed: 11/9/2023 13:45										
Specific Conductance (Lab)	ND		1 umhos/cm							U
<b>LCS (BCK0621-BS1)</b>										
Prepared: 11/9/2023 9:01, Analyzed: 11/9/2023 13:45										
Specific Conductance (Lab)	1410		umhos/cm	1410		100	80-120			
<b>Duplicate (BCK0621-DUP1) Source: 3111624-06</b>										
Prepared: 11/9/2023 9:01, Analyzed: 11/9/2023 13:45										
Specific Conductance (Lab)	5120	1	umhos/cm		5120			0.00	0.938	
<b>Duplicate (BCK0621-DUP2) Source: 3111624-01</b>										
Prepared: 11/9/2023 9:01, Analyzed: 11/9/2023 13:45										
Specific Conductance (Lab)	973	1	umhos/cm		978			0.513	0.938	
<b>Batch BCK0870 - Default Prep Wet Chem</b>										
<b>Blank (BCK0870-BLK1)</b>										
Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44										
Total Dissolved Solids	ND	25	mg/L							U





Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCK0870 - Default Prep Wet Chem

LCS (BCK0870-BS1)

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	1480	25	mg/L	1500		98.5	80-120			
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Duplicate (BCK0870-DUP1) Source: 3111623-01

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	4460	250	mg/L		4340			2.73	10	
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Duplicate (BCK0870-DUP2) Source: 3111625-01

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	5740	250	mg/L		5770			0.521	10	
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Batch BCK1259 - Default Prep Wet Chem

Blank (BCK1259-BLK1)

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	ND	13	mg/L							U
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LCS (BCK1259-BS1)

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	121	13	mg/L	125		96.8	90-110			
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Duplicate (BCK1259-DUP1) Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	ND	13	mg/L		9				25	U
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Matrix Spike (BCK1259-MS1) Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	270	13	mg/L	250	9	104	90-110			
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Matrix Spike Dup (BCK1259-MSD1) Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	270	13	mg/L	250	9	104	90-110	0.00	10	
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Batch BCK1372 - Default Prep Wet Chem

Blank (BCK1372-BLK1)

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 6:16

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
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Batch BCK1372 - Default Prep Wet Chem

LCS (BCK1372-BS1)

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 6:38

Total Organic Carbon	4.8	0.5	mg/L	5.00		96.0	80-120			
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Duplicate (BCK1372-DUP1) Source: 3111491-01

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 11:56

Total Organic Carbon	7.7	0.5	mg/L		7.8			1.67	25	
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Duplicate (BCK1372-DUP2) Source: 3111624-05

Prepared: 11/15/2023 9:48, Analyzed: 11/20/2023 22:54

Total Organic Carbon	0.4	0.5	mg/L		0.7			51.2	25	Y1, J
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Matrix Spike (BCK1372-MS1) Source: 3111491-02

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 12:17

Total Organic Carbon	6.8	0.5	mg/L	2.50	4.5	92.6	80-120			
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Matrix Spike (BCK1372-MS2) Source: 3111624-06

Prepared: 11/15/2023 9:48, Analyzed: 11/20/2023 23:15

Total Organic Carbon	6.5	0.5	mg/L	5.00	2.4	81.8	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
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**Batch BCK1030 - Default Prep IC**

**Blank (BCK1030-BLK1)**

Prepared: 11/11/2023 11:36, Analyzed: 11/11/2023 11:36

Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U

**LCS (BCK1030-BS1)**

Prepared: 11/11/2023 11:09, Analyzed: 11/11/2023 11:09

Chloride	12.6		mg/L	12.5		100	90-110			
Fluoride	5.2		mg/L	5.00		104	90-110			
Sulfate	25		mg/L	25.0		101	90-110			

**Matrix Spike (BCK1030-MS1) Source: 3111624-06**

Prepared: 11/11/2023 8:52, Analyzed: 11/11/2023 8:52

Fluoride	1.5		mg/L	5.00	0.4	21.3	75-125			M2
Chloride	140		mg/L	12.5	173	NR	75-125			M3
Sulfate	2200		mg/L	25.0	7630	NR	75-125			M3

**Matrix Spike (BCK1030-MS2) Source: 3111625-01**

Prepared: 11/11/2023 9:47, Analyzed: 11/11/2023 9:47

Chloride	1520		mg/L	12.5	2240	NR	75-125			M3
Fluoride	1.3		mg/L	5.00	0.3	19.3	75-125			M2
Sulfate	2090		mg/L	25.0	3770	NR	75-125			M3

**Matrix Spike Dup (BCK1030-MSD1) Source: 3111624-06**

Prepared: 11/11/2023 9:19, Analyzed: 11/11/2023 9:19

Chloride	138		mg/L	12.5	173	NR	75-125	1.87	15	M3
Fluoride	1.7		mg/L	5.00	0.4	24.2	75-125	9.09	15	M2
Sulfate	2160		mg/L	25.0	7630	NR	75-125	1.51	15	M3

**Matrix Spike Dup (BCK1030-MSD2) Source: 3111625-01**

Prepared: 11/11/2023 10:14, Analyzed: 11/11/2023 10:14

Chloride	1530		mg/L	12.5	2240	NR	75-125	0.502	15	M3
Fluoride	1.2		mg/L	5.00	0.3	18.6	75-125	2.73	15	M2
Sulfate	2100		mg/L	25.0	3770	NR	75-125	0.421	15	M3



**Certified Analyses included in this Report**

Analyte	Certifications
<b>2510 B-2011 in Water</b>	
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 FL Drinking Water Mdv (E871159)
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>5310 C-2014 in Water</b>	
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 MS Drinking Water MADV
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)

<b>Sample Acceptance Checklist for Work Order 3111624</b>	
Shipped By: Client	Temperature: 3.00° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624	(mm/dd/yy):	Time (24 hr):					
3111624-01 A	<u>11/7/23</u>	<u>1555</u>	Plastic 500mL pH<2 w/HNO3	1	MW1	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B <u>+Se, Ti, Fe</u>
			Preservation Check: pH: <u>✓</u>				
3111624-01 B	<u>11/7/23</u>	<u>1555</u>	Plastic 1L	1	MW1	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056 COD TOC
3111624-01 C	<u>11/7/23</u>	<u>1555</u>	Plastic 500mL pH<2 w/H2SO4	1	MW1	g / c	
			Preservation Check: pH: <u>✓</u>				
3111624-01 D	<u>11/7/23</u>	<u>1555</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW1	g / c	Radium 226 (sub)
			Preservation Check: pH: _____				

Preservation Check Performed by: *SW*

Field data collected by: *Eric Brown* Date (mm/dd/yy) 11/7/23 Time (24 hr) 1555 *mw-1*

pH 6.78 Cond (*ms*) 0.564 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.26 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Eric Brown* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

Scheduled for: **11/13/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** Green Landfill Semiannual Groundwater

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

Samples Chlorinated? Yes \_\_\_ No X

\*For composite samples please indicate begin time, end time and temp(°C) at end time below:

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (°C) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (°C) \_\_\_\_\_

LAB USE ONLY Workorder # 3111624 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-01 E	<u>11/7/23</u>	<u>1555</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH : _____				
3111624-01 F	<u>11/7/23</u>	<u>1555</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH : <u>1</u>				
3111624-01 G	<u>11/7/23</u>	<u>1555</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW1	g / c	Radium Total (sub)
			Preservation Check: pH : <u>1</u>				
3111624-01 H	<u>11/7/23</u>	<u>1555</u>	AG 250mL pH<2 w/H2SO4	1	MW1	g / c	TOC
			Preservation Check: pH : _____				

Preservation Check Performed by: [Signature]

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (°C) _____	or (°F) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		Tot Cl (mg/L) _____
		Free Cl (mg/L) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1420</u>
_____	_____	_____	_____
_____	_____	_____	_____



# Chain of Custody

Scheduled for: **11/13/2023**



Client: **Big Rivers Electric Corporation**  
**Reid/Green Station**

Report To:  
**Big Rivers Electric Corporation Reid/Green Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Invoice To:  
**Big Rivers Electric Corporation Reid/Green Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Project: **Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
<b>3111624</b>	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
3111624-02 A	<u>11/7/23</u>	<u>1500</u>	Plastic 500ml pH<2 w/HNO3	1	MW2	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B  <b>+Se, TI, Fe</b>
			Preservation Check: pH: <u>9</u>				
3111624-02 B	<u>11/7/23</u>	<u>1500</u>	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056 COD TOC
3111624-02 C	<u>11/7/23</u>	<u>1500</u>	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	
			Preservation Check: pH: <u>5</u>				
3111624-02 D	<u>11/7/23</u>	<u>1500</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW2	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>5</u>				
3111624-02 E	<u>11/7/23</u>	<u>1500</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
			Preservation Check: pH: _____				

Preservation Check Performed by: *Eric Brown*

Field data collected by: <u>Eric Brown</u>	Date (mm/dd/yy) <u>11/7/23</u>	Time (24 hr) <u>1500</u>	<u>MW-2</u>
pH <u>6.46</u>	Cond (uMm) <u>MS 1.10</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
Free Cl (mg/L) _____	Temp (oC) <u>16.71</u>	or (oF) _____	Static Water Level _____
DO (mg/L) _____	Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Turb. (NTU) _____			

Relinquished by: (Signature)

Received by: (Signature)

Date (mm/dd/yy)

Time (24 hr)

*Eric Brown*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*Shirley*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11/8/23  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

1420  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Chain of Custody

Scheduled for: 11/13/2023



Client: **Big Rivers Electric Corporation**  
Reid/Green Station

Report To:  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station

Project: **Green Landfill Semiannual Groundwater**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

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 N/A End Time            Temp (oC)           

Effluent: Start Date            Start time            End Date            End Time            Temp (oC)           

**LAB USE ONLY**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-02 F	<u>11/3/23</u>	<u>1500</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>1</u>				
3111624-02 G	<u>11/3/23</u>	<u>1500</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW2	g / c	Radium Total (sub)
			Preservation Check: pH: <u>1</u>				
3111624-02 H	<u>11/3/23</u>	<u>1500</u>	AG 250mL pH<2 w/H2SO4	1	MW2	g / c	TOC
			Preservation Check: pH: <u>1</u>				
3111624-03 A	<u>11/8/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/HNO3	1	MW3A	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B <b>+Se, Tl, Fe</b>
			Preservation Check: pH: <u>1</u>				
3111624-03 B	<u>11/8/23</u>	<u>1010</u>	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: *Eric Brown*

Field data collected by: <u>Eric Brown</u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1010</u>	<u>MW-3A</u>
pH <u>6.48</u>	Cond (umho/cm) <u>4.39</u>	Res Cl (mg/L) <u>          </u>	Tot Cl (mg/L) <u>          </u>
Temp (oC) <u>16.62</u>	or (oF) <u>          </u>	Static Water Level <u>          </u>	DO (mg/L) <u>          </u>
Flow (MGD) <u>          </u>	or (CFS) <u>          </u>	or (g/min) <u>          </u>	Turb. (NTU) <u>          </u>

Relinquished by: (Signature) <u><i>Eric Brown</i></u>	Received by: (Signature) <u><i>[Signature]</i></u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1420</u>
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# Chain of Custody

Scheduled for: 11/13/2023



Client: **Big Rivers Electric Corporation**  
Reid/Green Station

Report To:  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Project: **Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-03 C	<u>11/8/23</u>	<u>1010</u>	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
			Preservation Check: pH :	<u>/</u>			
3111624-03 D	<u>11/8/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-03 E	<u>11/8/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-03 F	<u>11/8/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-03 G	<u>11/8/23</u>	<u>1010</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW3A	g / c	Radium Total (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-03 H	<u>11/8/23</u>	<u>1010</u>	AG 250mL pH<2 w/H2SO4	1	MW3A	g / c	TOC
			Preservation Check: pH :	<u>/</u>			

Preservation Check Performed by: *SB*

Field data collected by: <u>Eric Brown</u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1010</u>	<u>MW-3A</u>
pH <u>6.48</u>	Cond ( $\mu$ mS/cm) <u>4.39</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
Temp (oC) <u>16.62</u>	or (oF) _____	Static Water Level _____	DO (mg/L) _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature)

Received by: (Signature)

Date (mm/dd/yy)

Time (24 hr)

*Eric Brown*

*Shugh*

11/8/23

1420

# Chain of Custody

Scheduled for: **11/13/2023**



Client: **Big Rivers Electric Corporation**  
**Reid/Green Station**

Report To:  
**Big Rivers Electric Corporation Reid/Green**  
**Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Invoice To:  
**Big Rivers Electric Corporation Reid/Green Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Project: **Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Mark Bertram*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time N/A Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624	(mm/dd/yy):	Time (24 hr):					
3111624-04 A	<u>11/3/23</u>	<u>1025</u>	Plastic 500mL pH<2 w/HNO3	1	MW4	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <u>✓</u>				<u>+Se, Ti, Fe</u>
3111624-04 B	<u>11/7/23</u>	<u>1026</u>	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3111624-04 C	<u>11/7/23</u>	<u>1025</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	COD TOC
			Preservation Check: pH: _____				
3111624-04 D	<u>11/7/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				
3111624-04 E	<u>11/7/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: *SW*

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) 11/13/23

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) *Mark Bertram* Received by: (Signature) *[Signature]* Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

Scheduled for: 11/13/2023



Client: **Big Rivers Electric Corporation**  
**Reid/Green Station**

Report To:  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Project: **Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Eric Brown  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-04 F	<u>11/7/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>/</u>				
3111624-04 G	<u>11/7/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW4	g / c	Radium Total (sub)
			Preservation Check: pH: <u>/</u>				
3111624-04 H	<u>11/7/23</u>	<u>1025</u>	AG 250mL pH<2 w/H2SO4	1	MW4	g / c	TOC
			Preservation Check: pH: <u>/</u>				
3111624-05 A	<u>11/7/23</u>	<u>0845</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B <b>+Se, Tl, Fe</b>
			Preservation Check: pH: <u>/</u>				
3111624-05 B	<u>11/7/23</u>	<u>0845</u>	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: EB

Field data collected by: Eric Brown Date (mm/dd/yy) 11/7/23 Time (24 hr) 1025 MW-4

pH 6.32 Cond (MS) 3.48 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.94 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Eric Brown Received by: (Signature) [Signature] Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: \_\_\_\_\_

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Eric Brown  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3111624 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-05 C	<u>11/7/23</u>	<u>0845</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH :	<u>/</u>			
3111624-05 D	<u>11/7/23</u>	<u>0845</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-05 E	<u>11/7/23</u>	<u>0845</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-05 F	<u>11/7/23</u>	<u>0845</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-05 G	<u>11/7/23</u>	<u>0845</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-05 H	<u>11/7/23</u>	<u>0845</u>	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
			Preservation Check: pH :	<u>/</u>			

Preservation Check Performed by: Eric Brown

Field data collected by: <u>Eric Brown</u>	Date (mm/dd/yy) <u>11/7/23</u>	Time (24 hr) <u>0845</u>	<u>MW-5</u>
pH <u>6.36</u>	Cond (umho) <u>3.44</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
Free Cl (mg/L) _____	Temp (oC) <u>16.10</u>	or (oF) _____	Static Water Level _____
DO (mg/L) _____	Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Turb. (NTU) _____			

Relinquished by: (Signature)

Eric Brown

Received by: (Signature)

Shy

Date (mm/dd/yy)

11/8/23

Time (24 hr)

1420



# Chain of Custody

Scheduled for: **11/13/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project:** Green Landfill Semiannual Groundwater

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000

PWS ID#: KY  
State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Eric Brown  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624							
3111624-06 A	<u>11/8/23</u>	<u>0905</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B <u>+Se, Tl, Fe</u>
			Preservation Check: pH: <u>✓</u>				
3111624-06 B	<u>11/8/23</u>	<u>0905</u>	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056 COD TOC
3111624-06 C	<u>11/8/23</u>	<u>0905</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	
			Preservation Check: pH: <u>✓</u>				
3111624-06 D	<u>11/8/23</u>	<u>0905</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				
3111624-06 E	<u>11/8/23</u>	<u>0905</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: EB

Field data collected by: Eric Brown Date (mm/dd/yy) 11/8/23 Time (24 hr) 0905 MW-6  
pH 6.34 Cond (uS) 2.99 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.37 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Eric Brown Received by: (Signature) [Signature] Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: Green Landfill Semiannual Groundwater**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Eric Brown  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

**\*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-06 F	<u>11/8/23</u>	<u>0905</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-06 G	<u>11/8/23</u>	<u>0905</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW6	g / c	Radium Total (sub)
			Preservation Check: pH :	<u>/</u>			
3111624-06 H	<u>11/8/23</u>	<u>0905</u>	AG 250mL pH<2 w/H2SO4	1	MW6	g / c	TOC
			Preservation Check: pH :	<u>/</u>			
3111624-07 A	<u>11/8/23</u>	<u>1030</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B <u>+Se, Ti, Fe</u>
			Preservation Check: pH :	<u>/</u>			
3111624-07 B	<u>11/8/23</u>	<u>1030</u>	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: SW

Field data collected by: Eric Brown Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) Eric Brown Received by: (Signature) [Signature] Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

Scheduled for: **11/13/2023**



Client: **Big Rivers Electric Corporation**  
**Reid/Green Station**

Report To:  
**Big Rivers Electric Corporation Reid/Green Station**  
**Mark Bertram**  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
**Big Rivers Electric Corporation Reid/Green Station**

Project: **Green Landfill Semiannual Groundwater**

**Mark Bertram**  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State:   KY  

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature):   *Eric Brun*    
\*required information\*

Compliance Monitoring? Yes \_\_\_ No   X  

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No   X  

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date   N/A   End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624							
Sample ID#							
3111624-07 C	<u>  11/8/23  </u>	<u>  1030  </u>	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH: <u>  /  </u>				
3111624-07 D	<u>  11/8/23  </u>	<u>  1030  </u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>  /  </u>				
3111624-07 E	<u>  11/8/23  </u>	<u>  1030  </u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>  /  </u>				
3111624-07 F	<u>  11/8/23  </u>	<u>  1030  </u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>  /  </u>				
3111624-07 G	<u>  11/8/23  </u>	<u>  1030  </u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH: <u>  /  </u>				
3111624-07 H	<u>  11/8/23  </u>	<u>  1030  </u>	AG 250mL pH<2 w/H2SO4	1	DUPLICATE	g / c	TOC
			Preservation Check: pH: <u>  /  </u>				

Preservation Check Performed by:   *EW*  

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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)

  *Eric Brun*  

  *[Signature]*  

  11/8/23  

  1420

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

**\*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624 Sample ID#							
3111624-08 A	<u>11/8/23</u>	<u>0915</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Beryllium Tot 6020 Cadmium Tot 6020 Calcium Tot 6010B Barium Tot 6020 Chromium Tot 6020 Cobalt Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Copper Tot 6020 Antimony Tot 6020 Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Sodium Tot 6010B
			Preservation Check: pH: <u>✓</u>				<u>+Se, Ti, Fe</u>
3111624-08 B	<u>11/8/23</u>	<u>0915</u>	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
3111624-08 C	<u>11/8/23</u>	<u>0915</u>	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH: _____				
3111624-08 D	<u>11/8/23</u>	<u>0915</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH: _____				
3111624-08 E	<u>11/8/23</u>	<u>0915</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH: _____				

Preservation Check Performed by: [Signature]

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: Green Landfill Semiannual Groundwater**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111624-08 F	<u>11/8/23</u>	<u>0915</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>/</u>				
3111624-08 G	<u>11/8/23</u>	<u>0915</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			Preservation Check: pH: <u>/</u>				
3111624-08 H	<u>11/8/23</u>	<u>0915</u>	AG 250mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	TOC
			Preservation Check: pH: <u>/</u>				

**Thermometer Serial Number**

/ 181390287  
181460057  
Temp 2.0°C

Preservation Check Performed by: [Signature]

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		DO (mg/L) _____
		Turb. (NTU) _____
		Free Cl (mg/L) _____

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1420</u>
_____	_____	_____	_____
_____	_____	_____	_____



December 08, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3111624-Revised Report  
Pace Project No.: 30639443

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on November 14, 2023. 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

(Greensburg, PA) - Revision 1 - This report replaces the December 7, 2023 report. This project was revised on December 8, 2023 to include QC sheets.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3111624-Revised Report  
Pace Project No.: 30639443

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30639443001	3111624-01	Water	11/07/23 15:55	11/14/23 10:20
30639443002	3111624-02	Water	11/07/23 00:00	11/14/23 10:20
30639443003	3111624-03	Water	11/07/23 00:00	11/14/23 10:20
30639443004	3111624-04	Water	11/07/23 00:00	11/14/23 10:20
30639443005	3111624-05	Water	11/07/23 00:00	11/14/23 10:20
30639443006	3111624-06	Water	11/08/23 00:00	11/14/23 10:20
30639443007	3111624-07	Water	11/08/23 00:00	11/14/23 10:20
30639443008	3111624-08	Water	11/08/23 00:00	11/14/23 10:20

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30639443001	3111624-01	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443002	3111624-02	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443003	3111624-03	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443004	3111624-04	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443005	3111624-05	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443006	3111624-06	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443007	3111624-07	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30639443008	3111624-08	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

**Sample: 3111624-01** Lab ID: 30639443001 Collected: 11/07/23 15:55 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.0720 ± 0.547 (1.08)</b> C:NA T:82%	pCi/L	12/07/23 14:24	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.104 ± 0.426 (0.967)</b> C:65% T:85%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.176 ± 0.973 (2.05)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**Sample: 3111624-02** Lab ID: 30639443002 Collected: 11/07/23 00:00 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.396 ± 0.562 (1.32)</b> C:NA T:85%	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.00129 ± 0.328 (0.774)</b> C:75% T:79%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.00129 ± 0.890 (2.09)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**Sample: 3111624-03** Lab ID: 30639443003 Collected: 11/07/23 00:00 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>1.00 ± 0.670 (0.831)</b> C:NA T:82%	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.45 ± 0.524 (0.722)</b> C:77% T:81%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.45 ± 1.19 (1.55)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

**Sample: 3111624-04** Lab ID: **30639443004** Collected: 11/07/23 00:00 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.000 ± 0.334 (0.748)</b> C:NA T:91%	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.32 ± 0.512 (0.765)</b> C:76% T:86%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.32 ± 0.846 (1.51)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**Sample: 3111624-05** Lab ID: **30639443005** Collected: 11/07/23 00:00 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.000 ± 0.607 (1.21)</b> C:NA T:87%	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.12 ± 0.531 (0.903)</b> C:73% T:77%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.12 ± 1.14 (2.11)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**Sample: 3111624-06** Lab ID: **30639443006** Collected: 11/08/23 00:00 Received: 11/14/23 10:20 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.220 ± 0.336 (0.541)</b> C:NA T:93%	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>-0.00535 ± 0.325 (0.767)</b> C:75% T:79%	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.220 ± 0.661 (1.31)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

**Sample: 3111624-07**      **Lab ID: 30639443007**      Collected: 11/08/23 00:00      Received: 11/14/23 10:20      Matrix: Water  
 PWS:      Site ID:      Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>-0.0683 ± 0.518 (1.08)</b> <b>C:NA T:81%</b>	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.477 ± 0.398 (0.793)</b> <b>C:79% T:77%</b>	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.477 ± 0.916 (1.87)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**Sample: 3111624-08**      **Lab ID: 30639443008**      Collected: 11/08/23 00:00      Received: 11/14/23 10:20      Matrix: Water  
 PWS:      Site ID:      Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.000 ± 0.487 (0.975)</b> <b>C:NA T:95%</b>	pCi/L	12/07/23 14:37	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.520 ± 0.407 (0.798)</b> <b>C:76% T:83%</b>	pCi/L	12/04/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.520 ± 0.894 (1.77)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3111624-Revised Report  
 Pace Project No.: 30639443

---

QC Batch:	630814	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 30639443001, 30639443002, 30639443003, 30639443004, 30639443005, 30639443006, 30639443007, 30639443008

---

METHOD BLANK: 3075669 Matrix: Water

Associated Lab Samples: 30639443001, 30639443002, 30639443003, 30639443004, 30639443005, 30639443006, 30639443007, 30639443008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.284 ± 0.361 (0.763) C:66% T:85%	pCi/L	12/04/23 15:21	

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: 3111624-Revised Report  
 Pace Project No.: 30639443

---

QC Batch:	630813	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 30639443001, 30639443002, 30639443003, 30639443004, 30639443005, 30639443006, 30639443007, 30639443008

---

METHOD BLANK: 3075668 Matrix: Water

Associated Lab Samples: 30639443001, 30639443002, 30639443003, 30639443004, 30639443005, 30639443006, 30639443007, 30639443008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.241 (0.540) C:NA T:88%	pCi/L	12/07/23 14:24	

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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## QUALIFIERS

Project: 3111624-Revised Report  
Pace Project No.: 30639443

### 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.

## REPORT OF LABORATORY ANALYSIS

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**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3111624**

**WO# : 30639443**



**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
<b>Sample ID: 3111624-01</b>	<b>Water</b>	<b>Sampled:11/07/2023 15:55</b>	<b>Specific Method</b>
Radium 228 (sub)	05/05/2024 15:55	EPA 904.0 Radium Sum C	
Radium Total (sub)	05/05/2024 15:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/05/2024 15:55	EPA 903.1	

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

<b>Sample ID: 3111624-02</b>	<b>Water</b>	<b>Sampled:11/07/2023 00:00</b>	<b>Specific Method</b>
Radium 226 (sub)	05/05/2024 00:00	EPA 903.1	
Radium 228 (sub)	05/05/2024 00:00	EPA 904.0 Radium Sum C	
Radium Total (sub)	05/05/2024 00:00	EPA 904.0 Radium Sum C	

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

<b>Sample ID: 3111624-03</b>	<b>Water</b>	<b>Sampled:11/07/2023 00:00</b>	<b>Specific Method</b>
Radium 226 (sub)	05/05/2024 00:00	EPA 903.1	
Radium 228 (sub)	05/05/2024 00:00	EPA 904.0 Radium Sum C	
Radium Total (sub)	05/05/2024 00:00	EPA 904.0 Radium Sum C	

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

Released By     K. D.     Date     11-13-23     Received By     [Signature]     Date     11/14/23 10:20    

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

3111624

Analysis Expires Laboratory ID Comments

Sample ID: 3111624-04 Water Sampled: 11/07/2023 00:00 Specific Method  
Radium Total (sub) 05/05/2024 00:00 EPA 904.0 Radium Sum C  
Radium 226 (sub) 05/05/2024 00:00 EPA 903.1  
Radium 228 (sub) 05/05/2024 00:00 EPA 904.0 Radium Sum C

SAMPLE STATE OF ORIGIN     <sup>KED</sup> KY     RUSH MULTIPLIER     0    

Sample ID: 3111624-05 Water Sampled: 11/07/2023 00:00 Specific Method  
Radium 228 (sub) 05/05/2024 00:00 EPA 904.0 Radium Sum C  
Radium Total (sub) 05/05/2024 00:00 EPA 904.0 Radium Sum C  
Radium 226 (sub) 05/05/2024 00:00 EPA 903.1

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

Sample ID: 3111624-06 Water Sampled: 11/08/2023 00:00 Specific Method  
Radium 226 (sub) 05/06/2024 00:00 EPA 903.1  
Radium 228 (sub) 05/06/2024 00:00 EPA 904.0 Radium Sum C  
Radium Total (sub) 05/06/2024 00:00 EPA 904.0 Radium Sum C

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

Sample ID: 3111624-07 Water Sampled: 11/08/2023 00:00 Specific Method  
Radium Total (sub) 05/06/2024 00:00 EPA 904.0 Radium Sum C  
Radium 226 (sub) 05/06/2024 00:00 EPA 903.1  
Radium 228 (sub) 05/06/2024 00:00 EPA 904.0 Radium Sum C

SAMPLE STATE OF ORIGIN     KY     RUSH MULTIPLIER     0    

**WO# : 30639443**  
PM: SMB Due Date: 12/07/23  
CLIENT: PACE\_44\_MVKY

Released By     K. De...     Date     11-13-23     Received By     [Signature]     Date     11/14/23 1000    

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

SUBCONTRACT ORDER  
Pace Analytical Services, LLC Kentucky  
3111624

Analysis	Expires	Laboratory ID	Comments
Sample ID: 3111624-08	Water	Sampled: 11/08/2023 00:00	Specific Method
Radium 226 (sub)	05/06/2024 00:00	EPA 903.1	
Radium 228 (sub)	05/06/2024 00:00	EPA 904.0 Radium Sum C	
Radium Total (sub)	05/06/2024 00:00	EPA 904.0 Radium Sum C	


SAMPLE STATE OF ORIGIN           KY           RUSH MULTIPLIER           0          

**WO# : 30639443**  
PM: SMB                      Due Date: 12/07/23  
CLIENT: PACE\_44\_MVKY

Released By           K. D.           Date           11-13-23           Received By           [Signature]           Date           11/14/23 1020          

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_




**DC# Title: ENV-FRM-GBUR-0088 v06\_Sample Condition Upon Receipt- Pittsburgh**  
**WO#: 30639443**  
 Effective Date: 09/20/2023  
 PM: SMB Due Date: 12/07/23  
 CLIENT: PACE\_44\_MVKY  
 Client Name: Pace KY

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other Initial / Date

Tracking Number: \_\_\_\_\_

Examined By: JS 11/14/23  
 Labeled By: JS 11/14/23  
 Temped By: JS 11/14/23

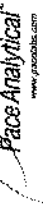
Custody Seal on Cooler/Box Present:  Yes  No Seals Intact:  Yes  No  
 Thermometer Used: 16 Type of Ice: (N/A) Blue None

Cooler Temperature: Observed Temp 3.0 °C Correction Factor: +0.0 °C Final Temp: 3.0 °C  
 Temp should be above freezing to 6°C 2.8

Comments:	Yes	No	NA	pH paper Lot# <u>100034</u>	D.P.D. Residual Chlorine Lot # _____
Chain of Custody Present	/			1.	
Chain of Custody Filled Out: -Were client corrections present on COC	/			2.	
Chain of Custody Relinquished	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5.	
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 samples field filtered:			/	13.	
Organic Samples checked for dechlorination			/	14.	
Filtered volume received for dissolved tests:			/	15.	
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	/			16.	
All containers meet method preservation requirements:	/			Initial when completed <u>JS</u>	Date/Time of Preservation
				Lot# of added Preservative	
8260C/D: Headspace in VOA Vials (> 6mm)		/		17.	
624.1: Headspace in VOA Vials (0mm)		/		18.	
Trip Blank Present:		/		Trip blank custody seal present? YES or NO	
Rad Samples Screened <.05 mrem/hr.	/			Initial when completed <u>JS</u>	Date: <u>11/14/23</u> Survey Meter SN: <u>25014350</u>
Comments:					

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

# Quality Control Sample Performance Assessment



Analyst **Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-226  
Analyst: MAR1  
Date: 11/27/2023  
Batch ID: 76478  
Matrix: DW

Method Blank Assessment	
MB Sample ID	3075666
MB Concentration:	0.000
MB Counting Uncertainty:	0.241
MB MDC:	0.540
MB Numerical Performance Indicator:	0.00
MB Status vs. Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCS/D (Y or N)?	
	LCS76478	YCS76478
Count Date:	12/7/2023	12/7/2023
Spike I.D.:	23-013	23-013
Spike Concentration (pCi/mL):	32.279	32.279
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.651	0.651
Target Conc. (pCi/L, g, F):	4.943	4.943
Uncertainty (Calculated):	0.232	0.232
Result (pCi/L, g, F):	4.692	4.692
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.139	0.973
Numerical Performance Indicator:	1.41	-0.49
Percent Recovery:	116.86%	94.92%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	133%	133%
Lower % Recovery Limits:	73%	73%

Duplicate Sample Assessment	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:	LCS76478
Duplicate Sample I.D.:	LCSD76478
Sample Result (pCi/L, g, F):	5.794
Sample Result Counting Uncertainty (pCi/L, g, F):	1.139
Sample Duplicate Result (pCi/L, g, F):	4.692
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.973
Are sample and/or duplicate results below RL?	NO
Duplicate Numerical Performance Indicator:	1.441
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	20.71%
Duplicate Status vs Numerical Indicator:	N/A
Duplicate Status vs RPD:	Pass
% RPD Limit:	32%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.:		
Sample MS I.D.:		
Sample MSD I.D.:		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc. (pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (Calculated):		
MSD Spike Uncertainty (Calculated):		
Sample Result:		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment
Sample I.D.:
Sample MS I.D.:
Sample Matrix Spike Result:
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):
Sample Matrix Spike Duplicate Result:
Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):
Duplicate Numerical Performance Indicator:
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:
MS/MSD Duplicate Status vs RPD:
% RPD Limit:

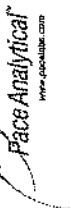
## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

LL 12 07 23

VAM 12/17/23

# Quality Control Sample Performance Assessment



Analyst Must Manually Enter All Fields Highlighted in Yellow.

Test: Ra-228  
Analyst: JJS1  
Date: 11/29/2023  
Worklist: 76479  
Matrix: WT

Method Blank Assessment	
MB Sample ID	3075669
MB concentration:	0.284
MB 2 Sigma CSU:	0.361
MB MDC:	0.763
MB Numerical Performance Indicator:	1.54
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	
LCS# (Y or NY?)	Y
LCS76479	LCS76479
Count Date:	12/4/2023
Spike I.D.:	23-043
Decay Corrected Spike Concentration (pCi/mL):	38.775
Volume Used (mL):	0.10
Aliquot Volume (L, g, F):	0.817
Target Conc. (pCi/L, g, F):	4.744
Uncertainty (Calculated):	0.232
Result (pCi/L, g, F):	5.091
LCSA/LCSD 2 Sigma CSU (pCi/L, g, F):	1.134
Numerical Performance Indicator:	1.17
Percent Recovery:	115.45%
Status vs Numerical Indicator:	N/A
Upper % Recovery Limits:	Pass
Lower % Recovery Limits:	135%
	60%

Duplicate Sample Assessment	
Sample I.D.:	LCS76479
Duplicate Sample I.D.:	LCS76479
Sample Result (pCi/L, g, F):	5.434
Sample Duplicate Result (pCi/L, g, F):	1.197
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	5.091
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.134
Are sample and/or duplicate results below RL?	NO
Duplicate Numerical Performance Indicator:	0.409
Duplicate Percent Recoveries Duplicate RPD:	7.31%
Duplicate Status vs Numerical Indicator:	Pass
Duplicate Status vs RPD:	Pass
% RPD Limit:	36%

Sample Matrix Spike Control Assessment	
Sample Collection Date:	Sample I.D.
Sample MS I.D.:	Sample MS I.D.
Sample MSD I.D.:	Sample MSD I.D.
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	MS/MSD 1
Spike Volume Used in MS (mL):	MS/MSD 2
Spike Volume Used in MSD (mL):	
MS Aliquot (L, g, F):	
MS Target Conc. (pCi/L, g, F):	
MSD Aliquot (L, g, F):	
MSD Target Conc. (pCi/L, g, F):	
MS Spike Uncertainty (calculated):	
MSD Spike Uncertainty (calculated):	
Sample Result:	
Sample Result 2 Sigma CSU (pCi/L, g, F):	
Sample Matrix Spike Result:	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	
Sample Matrix Spike Duplicate Result:	
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	
MS Numerical Performance Indicator:	
MSD Numerical Performance Indicator:	
MS Percent Recovery:	
MSD Percent Recovery:	
MS Status vs Numerical Indicator:	
MSD Status vs Numerical Indicator:	
MS Status vs Recovery:	
MSD Status vs Recovery:	
MS/MSD Upper % Recovery Limits:	
MS/MSD Lower % Recovery Limits:	

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	Sample I.D.
Sample MS I.D.:	Sample MS I.D.
Sample MSD I.D.:	Sample MSD I.D.
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
Sample Matrix Spike Duplicate Result:	Sample Matrix Spike Duplicate Result:
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):
Duplicate Numerical Performance Indicator:	Duplicate Numerical Performance Indicator:
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:	(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs Numerical Indicator:
% RPD Limit:	% RPD Limit:

# Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*Handwritten notes:*  
VAC  
12/5/23  
12/5/23



## Certificate of Analysis 3111625

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 12/11/2023 15:36

Project Name: Green Landfill Semiannual Well MW104	Workorder: 3111625
--	--------------------

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/08/2023 14:20.

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](http://www.pacelabs.com)

### SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3111625-01	MW-104/	Groundwater	11/07/2023 11:25	11/08/2023 14:20	Eric Brown
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
3111625-01	Field Conductance				4820
	Field pH				6.35
	Field Temp (C)				17.28



**ANALYTICAL RESULTS**

Lab Sample ID: **3111625-01**  
 Description: **MW-104**

Sample Collection Date Time: 11/07/2023 11:25  
 Sample Received Date Time: 11/08/2023 14:20

**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	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Arsenic</b>	<b>0.0010</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Boron</b>	<b>0.24</b>		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 16:55	MRWD
<b>Cadmium</b>	<b>0.0004</b>	J	mg/L	0.0010	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Calcium</b>	<b>496</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 17:01	MRWD
<b>Chromium</b>	<b>0.0006</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Cobalt</b>	<b>0.004</b>		mg/L	0.004	0.004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Copper</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Iron</b>	<b>0.412</b>		mg/L	0.100	0.050	SW846 6010 B	11/16/2023 11:51	11/17/2023 13:57	MRWD
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Lithium</b>	<b>0.05</b>		mg/L	0.02	0.005	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB
<b>Sodium</b>	<b>736</b>	D1	mg/L	26.0	10.0	SW846 6010 B	11/16/2023 11:51	11/17/2023 14:00	MRWD
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:50	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chemical Oxygen Demand</b>	<b>95</b>		mg/L	13	8	HACH 8000	11/14/2023 08:18	11/15/2023 10:50	HMF
<b>Specific Conductance (Lab)</b>	<b>8330</b>		umhos/cm	1	1	2510 B-2011	11/10/2023 08:16	11/14/2023 16:17	AED
<b>pH (Lab)</b>	<b>7.33</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:58	11/09/2023 16:18	AED
<b>Total Dissolved Solids</b>	<b>5770</b>		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG
<b>Total Organic Carbon</b>	<b>0.9</b>		mg/L	0.5	0.4	5310 C-2014	11/15/2023 09:48	11/16/2023 14:45	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.00	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	0.710	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	0.710	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
See Attached Subcontract Report	0.710	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>2490</b>	D, M3	mg/L	10.0	7.2	SW846 9056	11/11/2023 07:57	11/11/2023 07:57	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	11/11/2023 07:30	11/11/2023 07:30	CSC
<b>Sulfate</b>	<b>4190</b>	D, M3	mg/L	50	25	SW846 9056	11/11/2023 08:25	11/11/2023 08:25	CSC



**Notes for work order 3111625**

- 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.
- B Target analyte detected in method blank at or above the method reporting limit.
- D Results reported from dilution.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- J5 Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
- L2 The associated blank spike recovery was below method acceptance limits.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

- 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





**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
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**Batch BCK0852 - EPA 200.2**

**Blank (BCK0852-BLK1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:34

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
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**Blank (BCK0852-BLK2)**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:01

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Iron	0.658	0.100	mg/L							B
Sodium	ND	0.26	mg/L							U

**Blank (BCK0852-BLK3)**

Prepared: 11/10/2023 9:07, Analyzed: 11/16/2023 11:16

Iron	0.720	0.100	mg/L							B
Sodium	ND	0.26	mg/L							U

**LCS (BCK0852-BS1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:37

Mercury	0.0024	0.0005	mg/L	0.00250		94.4	85-115			
Molybdenum	0.06	0.01	mg/L	0.0625		98.5	85-115			
Antimony	0.061	0.005	mg/L	0.0625		98.0	85-115			
Arsenic	0.0605	0.0010	mg/L	0.0625		96.9	85-115			
Barium	0.060	0.004	mg/L	0.0625		95.3	85-115			
Beryllium	0.0580	0.0020	mg/L	0.0625		92.8	85-115			
Cadmium	0.0590	0.0010	mg/L	0.0625		94.4	85-115			
Chromium	0.0613	0.0020	mg/L	0.0625		98.1	85-115			
Cobalt	0.060	0.004	mg/L	0.0625		96.2	85-115			
Copper	0.060	0.003	mg/L	0.0625		95.7	85-115			
Lead	0.056	0.002	mg/L	0.0625		89.1	85-115			
Lithium	0.06	0.02	mg/L	0.0625		91.3	85-115			
Selenium	0.060	0.003	mg/L	0.0625		95.7	85-115			
Thallium	0.0576	0.0020	mg/L	0.0625		92.2	85-115			



**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
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**Batch BCK0852 - EPA 200.2**

**LCS (BCK0852-BS2)**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:04

Boron	0.11	0.10	mg/L	0.125		88.9	85-115			
Calcium	5.71	0.40	mg/L	6.25		91.4	85-115			
Iron	5.50	0.100	mg/L	6.25		88.0	85-115			B
Sodium	4.80	0.26	mg/L	6.25		76.8	85-115			L2

**LCS (BCK0852-BS3)**

Prepared: 11/10/2023 9:07, Analyzed: 11/16/2023 11:19

Iron	6.00	0.100	mg/L	6.25		95.9	85-115			B
Sodium	5.18	0.26	mg/L	6.25		82.9	85-115			L2

**Matrix Spike (BCK0852-MS1)**

Source: 3111623-01

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:01

Molybdenum	0.06	0.01	mg/L	0.0625	ND	101	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	91.3	80-120			
Antimony	0.065	0.005	mg/L	0.0625	ND	103	80-120			
Arsenic	0.0637	0.0010	mg/L	0.0625	ND	102	80-120			
Barium	0.097	0.004	mg/L	0.0625	0.037	95.1	80-120			
Beryllium	0.0580	0.0020	mg/L	0.0625	ND	92.9	80-120			
Cadmium	0.0588	0.0010	mg/L	0.0625	ND	94.1	80-120			
Chromium	0.0602	0.0020	mg/L	0.0625	ND	96.3	80-120			
Cobalt	0.058	0.004	mg/L	0.0625	ND	92.3	80-120			
Copper	0.055	0.003	mg/L	0.0625	ND	88.3	80-120			
Lead	0.054	0.002	mg/L	0.0625	ND	85.7	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.04	86.6	80-120			
Selenium	0.063	0.003	mg/L	0.0625	ND	101	80-120			
Thallium	0.0554	0.0020	mg/L	0.0625	ND	88.6	80-120			

**Matrix Spike (BCK0852-MS2)**

Source: 3111624-06

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:09

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	94.4	80-120			
Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120			
Arsenic	0.0652	0.0010	mg/L	0.0625	ND	104	80-120			
Barium	0.069	0.004	mg/L	0.0625	0.009	96.0	80-120			
Beryllium	0.0568	0.0020	mg/L	0.0625	ND	91.0	80-120			
Cadmium	0.0573	0.0010	mg/L	0.0625	ND	91.7	80-120			
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120			
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.1	80-120			
Copper	0.057	0.003	mg/L	0.0625	ND	90.4	80-120			
Lead	0.053	0.002	mg/L	0.0625	ND	84.8	80-120			
Lithium	0.10	0.02	mg/L	0.0625	0.04	89.2	80-120			
Selenium	0.070	0.003	mg/L	0.0625	ND	111	80-120			
Thallium	0.0551	0.0020	mg/L	0.0625	ND	88.2	80-120			



**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
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**Batch BCK0852 - EPA 200.2**

**Matrix Spike (BCK0852-MS3) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:33

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	226	4.00	mg/L	6.25	221	81.5	80-120			D2
Iron	8.11	1.00	mg/L	6.25	2.26	93.6	80-120			D2, B
Sodium	876	2.60	mg/L	6.25	895	NR	80-120			D2, M3

**Matrix Spike (BCK0852-MS4) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:39

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	377	4.00	mg/L	6.25	375	24.5	80-120			D2, M3
Iron	5.83	1.00	mg/L	6.25	ND	93.4	80-120			D2, B
Sodium	351	2.60	mg/L	6.25	351	NR	80-120			D2, M3

**Matrix Spike Dup (BCK0852-MSD1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:05

Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	2.41	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	100	80-120	0.770	20	
Mercury	0.0023	0.0005	mg/L	0.00250	ND	92.7	80-120	1.53	20	
Arsenic	0.0626	0.0010	mg/L	0.0625	ND	100	80-120	1.81	20	
Barium	0.096	0.004	mg/L	0.0625	0.037	93.4	80-120	1.13	20	
Beryllium	0.0582	0.0020	mg/L	0.0625	ND	93.1	80-120	0.231	20	
Cadmium	0.0578	0.0010	mg/L	0.0625	ND	92.5	80-120	1.74	20	
Chromium	0.0596	0.0020	mg/L	0.0625	ND	95.4	80-120	0.955	20	
Cobalt	0.057	0.004	mg/L	0.0625	ND	90.8	80-120	1.64	20	
Copper	0.054	0.003	mg/L	0.0625	ND	86.6	80-120	1.94	20	
Lead	0.053	0.002	mg/L	0.0625	ND	84.3	80-120	1.71	20	
Lithium	0.09	0.02	mg/L	0.0625	0.04	86.3	80-120	0.238	20	
Selenium	0.063	0.003	mg/L	0.0625	ND	101	80-120	0.368	20	
Thallium	0.0544	0.0020	mg/L	0.0625	ND	87.0	80-120	1.83	20	

**Matrix Spike Dup (BCK0852-MSD2) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:12

Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120	5.07	20	J5
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	0.478	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	98.5	80-120	4.18	20	J5
Arsenic	0.0662	0.0010	mg/L	0.0625	ND	106	80-120	1.49	20	
Barium	0.071	0.004	mg/L	0.0625	0.009	98.1	80-120	1.86	20	J5
Beryllium	0.0583	0.0020	mg/L	0.0625	ND	93.3	80-120	2.56	20	
Cadmium	0.0597	0.0010	mg/L	0.0625	ND	95.5	80-120	4.07	20	J5
Chromium	0.0621	0.0020	mg/L	0.0625	ND	99.3	80-120	0.0251	20	
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.9	80-120	0.825	20	
Copper	0.057	0.003	mg/L	0.0625	ND	91.6	80-120	1.34	20	
Lead	0.055	0.002	mg/L	0.0625	ND	87.6	80-120	3.24	20	J5
Lithium	0.10	0.02	mg/L	0.0625	0.04	94.3	80-120	3.10	20	
Selenium	0.069	0.003	mg/L	0.0625	ND	110	80-120	0.900	20	
Thallium	0.0567	0.0020	mg/L	0.0625	ND	90.7	80-120	2.82	20	J5



**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
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**Batch BCK0852 - EPA 200.2**

**Matrix Spike Dup (BCK0852-MSD3) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:36

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	220	4.00	mg/L	6.25	221	NR	80-120	2.58	20	D2, M3
Iron	8.02	1.00	mg/L	6.25	2.26	92.2	80-120	1.07	20	D2, B
Sodium	853	2.60	mg/L	6.25	895	NR	80-120	2.61	20	D2, M3

**Matrix Spike Dup (BCK0852-MSD4) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:43

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	374	4.00	mg/L	6.25	375	NR	80-120	0.676	20	D2, M3
Iron	5.80	1.00	mg/L	6.25	ND	92.9	80-120	0.507	20	D2, B
Sodium	349	2.60	mg/L	6.25	351	NR	80-120	0.649	20	D2, M3

**Post Spike (BCK0852-PS1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:16

Mercury	0.0024	0.0005	mg/L	0.00250	ND	96.7	75-125			J5
Antimony	0.068	0.005	mg/L	0.0625	ND	109	75-125			J5
Molybdenum	0.06	0.01	mg/L	0.0625	ND	101	75-125			
Arsenic	0.0632	0.0010	mg/L	0.0625	ND	101	75-125			
Barium	0.102	0.004	mg/L	0.0625	0.037	104	75-125			J5
Beryllium	0.0625	0.0020	mg/L	0.0625	ND	100	75-125			
Cadmium	0.0617	0.0010	mg/L	0.0625	ND	98.7	75-125			J5
Chromium	0.0590	0.0020	mg/L	0.0625	ND	94.4	75-125			
Cobalt	0.056	0.004	mg/L	0.0625	ND	90.4	75-125			
Copper	0.054	0.003	mg/L	0.0625	ND	87.0	75-125			
Lead	0.057	0.002	mg/L	0.0625	ND	90.6	75-115			J5
Lithium	0.10	0.02	mg/L	0.0625	0.04	102	75-125			
Selenium	0.063	0.003	mg/L	0.0625	ND	101	75-125			
Thallium	0.0587	0.0020	mg/L	0.0625	ND	93.9	75-125			J5

**Post Spike (BCK0852-PS2) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:46

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	230	4.00	mg/L	6.25	221	149	75-125			D2
Iron	8.16	1.00	mg/L	6.25	2.26	94.3	75-125			D2, B
Sodium	891	2.60	mg/L	6.25	895	NR	75-125			D2, M3



**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
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**Batch BCK1517 - EPA 200.2**

**Blank (BCK1517-BLK1)**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 13:03

Iron	ND	0.100	mg/L							U
Sodium	ND	0.26	mg/L							U

**LCS (BCK1517-BS1)**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 13:06

Iron	6.47	0.100	mg/L	6.25		104	85-115			
Sodium	6.06	0.26	mg/L	6.25		96.9	85-115			

**Matrix Spike (BCK1517-MS1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:03

Iron	7.53	10.0	mg/L	6.25	ND	121	80-120			D2, M2, J
Sodium	196	26.0	mg/L	6.25	206	NR	80-120			D2, M2

**Matrix Spike Dup (BCK1517-MSD1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:06

Iron	7.72	10.0	mg/L	6.25	ND	124	80-120	2.45	20	D2, M2, J
Sodium	199	26.0	mg/L	6.25	206	NR	80-120	1.12	20	D2

**Post Spike (BCK1517-PS1) Source: 3111624-01RE1**

Prepared: 11/16/2023 11:51, Analyzed: 11/17/2023 14:19

Iron	7.22	10.0	mg/L	6.25	ND	115	75-125			D2, J
Sodium	183	26.0	mg/L	6.25	206	NR	75-125			D2, M2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCK0832 - Default Prep Micro

LCS (BCK0832-BS1)

Prepared: 11/9/2023 8:58, Analyzed: 11/9/2023 16:18

pH (Lab)	5.04		Std. Units	5.00		101	98.8-101.2			
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Duplicate (BCK0832-DUP1) Source: 3111625-01

Prepared: 11/9/2023 8:58, Analyzed: 11/9/2023 16:18

pH (Lab)	7.37	0.10	Std. Units		7.33			0.544	10	H3
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Batch BCK0870 - Default Prep Wet Chem

Blank (BCK0870-BLK1)

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCK0870-BS1)

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	1480	25	mg/L	1500		98.5	80-120			
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Duplicate (BCK0870-DUP1) Source: 3111623-01

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	4460	250	mg/L		4340			2.73	10	
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Duplicate (BCK0870-DUP2) Source: 3111625-01

Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44

Total Dissolved Solids	5740	250	mg/L		5770			0.521	10	
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Batch BCK0963 - Default Prep Micro

Blank (BCK0963-BLK1)

Prepared: 11/13/2023 10:59, Analyzed: 11/14/2023 16:17

Specific Conductance (Lab)	ND	1	umhos/cm							U
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LCS (BCK0963-BS1)

Prepared: 11/13/2023 10:59, Analyzed: 11/14/2023 16:17

Specific Conductance (Lab)	1410		umhos/cm	1410		99.8	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
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Batch BCK0963 - Default Prep Micro

Duplicate (BCK0963-DUP1)

Source: 3111625-01

Prepared: 11/13/2023 10:59, Analyzed: 11/14/2023 16:17

Specific Conductance (Lab)	8380	1	umhos/cm		8330			0.598	0.938	
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Batch BCK1259 - Default Prep Wet Chem

Blank (BCK1259-BLK1)

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	ND	13	mg/L							U
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LCS (BCK1259-BS1)

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	121	13	mg/L	125		96.8	90-110			
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Duplicate (BCK1259-DUP1)

Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	ND	13	mg/L		9				25	U
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Matrix Spike (BCK1259-MS1)

Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	270	13	mg/L	250	9	104	90-110			
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Matrix Spike Dup (BCK1259-MSD1)

Source: 3111624-01

Prepared: 11/14/2023 8:18, Analyzed: 11/15/2023 10:50

Chemical Oxygen Demand	270	13	mg/L	250	9	104	90-110	0.00	10	
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Batch BCK1372 - Default Prep Wet Chem

Blank (BCK1372-BLK1)

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 6:16

Total Organic Carbon	ND	0.5	mg/L							U
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LCS (BCK1372-BS1)

Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 6:38

Total Organic Carbon	4.8	0.5	mg/L	5.00		96.0	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
<b>Batch BCK1372 - Default Prep Wet Chem</b>										
<b>Duplicate (BCK1372-DUP1) Source: 3111491-01</b>										
Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 11:56										
Total Organic Carbon	7.7	0.5	mg/L		7.8			1.67	25	
<b>Duplicate (BCK1372-DUP2) Source: 3111624-05</b>										
Prepared: 11/15/2023 9:48, Analyzed: 11/20/2023 22:54										
Total Organic Carbon	0.4	0.5	mg/L		0.7			51.2	25	Y1, J
<b>Matrix Spike (BCK1372-MS1) Source: 3111491-02</b>										
Prepared: 11/15/2023 9:48, Analyzed: 11/16/2023 12:17										
Total Organic Carbon	6.8	0.5	mg/L	2.50	4.5	92.6	80-120			
<b>Matrix Spike (BCK1372-MS2) Source: 3111624-06</b>										
Prepared: 11/15/2023 9:48, Analyzed: 11/20/2023 23:15										
Total Organic Carbon	6.5	0.5	mg/L	5.00	2.4	81.8	80-120			



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK1030 - Default Prep IC**

**Blank (BCK1030-BLK1)**

Prepared: 11/11/2023 11:36, Analyzed: 11/11/2023 11:36

Fluoride	ND	0.2	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1	mg/L							U

**LCS (BCK1030-BS1)**

Prepared: 11/11/2023 11:09, Analyzed: 11/11/2023 11:09

Chloride	12.6		mg/L	12.5		100	90-110			
Fluoride	5.2		mg/L	5.00		104	90-110			
Sulfate	25		mg/L	25.0		101	90-110			

**Matrix Spike (BCK1030-MS1) Source: 3111624-06**

Prepared: 11/11/2023 8:52, Analyzed: 11/11/2023 8:52

Fluoride	1.5		mg/L	5.00	0.4	21.3	75-125			M2
Chloride	140		mg/L	12.5	173	NR	75-125			M3
Sulfate	2200		mg/L	25.0	7630	NR	75-125			M3

**Matrix Spike (BCK1030-MS2) Source: 3111625-01**

Prepared: 11/11/2023 9:47, Analyzed: 11/11/2023 9:47

Fluoride	1.3		mg/L	5.00	0.3	19.3	75-125			M2
Chloride	1520		mg/L	12.5	2240	NR	75-125			M3
Sulfate	2090		mg/L	25.0	3770	NR	75-125			M3

**Matrix Spike Dup (BCK1030-MSD1) Source: 3111624-06**

Prepared: 11/11/2023 9:19, Analyzed: 11/11/2023 9:19

Chloride	138		mg/L	12.5	173	NR	75-125	1.87	15	M3
Fluoride	1.7		mg/L	5.00	0.4	24.2	75-125	9.09	15	M2
Sulfate	2160		mg/L	25.0	7630	NR	75-125	1.51	15	M3

**Matrix Spike Dup (BCK1030-MSD2) Source: 3111625-01**

Prepared: 11/11/2023 10:14, Analyzed: 11/11/2023 10:14

Chloride	1530		mg/L	12.5	2240	NR	75-125	0.502	15	M3
Fluoride	1.2		mg/L	5.00	0.3	18.6	75-125	2.73	15	M2
Sulfate	2100		mg/L	25.0	3770	NR	75-125	0.421	15	M3



**Certified Analyses included in this Report**

Analyte	Certifications
<b>2510 B-2011 in Water</b>	
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 FL Drinking Water Mdv (E871159)
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>5310 C-2014 in Water</b>	
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 MS Drinking Water MADV
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030) VA NELAC MDV (460210) WV Wastewater Madisonville (241), 825 Industrial Rd Madisonville, KY 42431
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)

<b>Sample Acceptance Checklist for Work Order 3111625</b>	
Shipped By: Client	Temperature: 3.00° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

### Chain of Custody

Scheduled for: 11/13/2023



Client: **Big Rivers Electric Corporation**  
Reid/Green Station

Report To:  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Project: **Green Landfill Semiannual Well MW104**

Phone: (270) 844-8000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

\*For composite samples please indicate begin time, end time and temp (oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No X

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3111625 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111625-01 A	<u>11/7/23</u>	<u>1125</u>	Plastic 500mL pH<2 w/HNO3	1	MW-104	g / c	Thallium Tot 6020 Antimony Tot 6020 Beryllium Tot 6020 Barium Tot 6020 Arsenic Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Copper Tot 6020 Iron Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020  <u>+Se, Tl, Fe</u>
3111625-01 B	<u>11/7/23</u>	<u>1125</u>	Plastic 1L	1	MW-104	g / c	Chloride 9056 Fluoride 9056 pH (Lab) Sulfate 9056 TDS COD TOC
3111625-01 C	<u>11/7/23</u>	<u>1125</u>	Plastic 500mL pH<2 w/H2SO4	1	MW-104	g / c	
3111625-01 D	<u>11/7/23</u>	<u>1125</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-104	g / c	Radium 226 (sub)
3111625-01 E	<u>11/7/23</u>	<u>1125</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)

Preservation Check Performed by: *CB*

Field data collected by: Eric Brown Date (mm/dd/yy) 11/7/23 Time (24 hr) 1125  
pH 6.35 Cond 4.82 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.28 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by (Signature): *Eric Brown* Received by (Signature): *[Signature]* Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

**Scheduled for: 11/13/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** Green Landfill Semiannual Well MW104

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: \_\_\_\_\_

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 # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111625-01 F	<u>11/7/23</u>	<u>1125</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>/</u>				
3111625-01 G	<u>11/7/23</u>	<u>1125</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-104	g / c	Radium Total (sub)
			Preservation Check: pH: <u>/</u>				
3111625-01 H	<u>11/7/23</u>	<u>1125</u>	AG 250mL pH<2 w/H2SO4	1	MW-104	g / c	TOC
			Preservation Check: pH: <u>/</u>				

**Thermometer Serial Number**  
181390287  
181460057  
Temp 3.0 C

Preservation Check Performed by: [Signature]

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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): [Signature] Received by (Signature): [Signature] Date (mm/dd/yy): 11/8/23 Time (24 hr): 1420

PACE- Check here if trip charge applied to associated COC

Printed: 10/31/2023 8:37:38AM



December 08, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3111625-Revised Report  
Pace Project No.: 30639440

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on November 15, 2023. 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

(Greensburg, PA) - Revision 1 - This report replaces the December 7, 2023 report. This project was revised on December 8, 2023 to include QC sheets.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 3111625-Revised Report  
 Pace Project No.: 30639440

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3111625-Revised Report  
Pace Project No.: 30639440

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30639440001	3111625-01	Water	11/08/23 11:25	11/15/23 12:34

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 3111625-Revised Report  
Pace Project No.: 30639440

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30639440001	3111625-01	EPA 903.1	MAR1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

### REPORT OF LABORATORY ANALYSIS

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3111625-Revised Report  
 Pace Project No.: 30639440

**Sample: 3111625-01**      **Lab ID: 30639440001**      Collected: 11/08/23 11:25      Received: 11/15/23 12:34      Matrix: Water  
 PWS:      Site ID:      Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	<b>0.000 ± 0.566 (1.13)</b> <b>C:NA T:92%</b>	pCi/L	12/07/23 14:51	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	<b>0.710 ± 0.529 (1.05)</b> <b>C:69% T:86%</b>	pCi/L	12/04/23 15:23	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	<b>0.710 ± 1.10 (2.18)</b>	pCi/L	12/07/23 16:35	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3111625-Revised Report  
 Pace Project No.: 30639440

QC Batch: 630814	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30639440001

METHOD BLANK: 3075669 Matrix: Water

Associated Lab Samples: 30639440001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.284 ± 0.361 (0.763) C:66% T:85%	pCi/L	12/04/23 15:21	

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: 3111625-Revised Report  
 Pace Project No.: 30639440

QC Batch: 630813	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30639440001

METHOD BLANK: 3075668 Matrix: Water

Associated Lab Samples: 30639440001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.241 (0.540) C:NA T:88%	pCi/L	12/07/23 14:24	

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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## QUALIFIERS

Project: 3111625-Revised Report  
Pace Project No.: 30639440

### 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.

## REPORT OF LABORATORY ANALYSIS

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**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3111625**

**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: 3111625-01	Water	Sampled: 11/08/2023 11:25	Specific Method
Radium Total (sub)	05/06/2024 11:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/06/2024 11:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/06/2024 11:25	EPA 903.1	

SAMPLE STATE OF ORIGIN

KY

RUSH MULTIPLIER

0


**WO# : 30639440**



30639440

K. D. 11-13-23 [Signature] 11/14/23 10:00  
 Date Date Received By Date




 DC# Title: ENV-FRM-GBUR-0088 v06\_Sample Condition Upon Receipt  
 Pittsburgh  
 Effective Date: 09/20/2023  
 Client Name: Pace KY

WO#: 30639440  
 PM: SMB  
 Due Date: 12/08/23  
 CLIENT: PRCE\_44\_MVKY

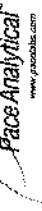
Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other  
 Initial / Date: \_\_\_\_\_  
 Tracking Number: \_\_\_\_\_  
 Examined By: J Sullivan  
 Labeled By: J Sullivan  
 Temped By: J Sullivan

Custody Seal on Cooler/Box Present:  Yes  No  
 Thermometer Used: 16 Type of Ice: Wed Blue None  
 Seals Intact:  Yes  No  
 Cooler Temperature: Observed Temp 4.6 °C Correction Factor: +0.0 °C Final Temp: 4.6 °C  
 Temp should be above freezing to 6°C

Comments:	pH paper Lot#			D.P.D. Residual Chlorine Lot #
	Yes	No	NA	
Chain of Custody Present	/			1020134
Chain of Custody Filled Out: -Were client corrections present on COC	/			
Chain of Custody Relinquished	/			
Sampler Name & Signature on COC:	/			
Sample Labels match COC: -Includes date/time/ID Matrix:	/			
Samples Arrived within Hold Time:	/			
Short Hold Time Analysis (<72hr remaining):	/			
Rush Turn Around Time Requested:	/			
Sufficient Volume:	/			
Correct Containers Used: -Pace Containers Used	/			
Containers Intact:	/			
Orthophosphate field filtered:	/			
Hex Cr Aqueous samples field filtered:	/			
Organic Samples checked for dechlorination	/			
Filtered volume received for dissolved tests:	/			
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	/			
All containers meet method preservation requirements:	/			PKC2 Initial when completed <u>JS</u> Date/Time of Preservation _____ Lot# of added Preservative _____
8260C/D: Headspace in VOA Vials (> 6mm)	/			
624.1: Headspace in VOA Vials (0mm)	/			
Trip Blank Present:	/			Trip blank custody seal present? YES or NO
Rad Samples Screened <.05 mrem/hr.	/			Initial when completed <u>JS</u> Date: <u>11/19/23</u> Survey Meter SN: <u>25014380</u>
Comments:				

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PA Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

# Quality Control Sample Performance Assessment



Analyst **Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-226  
Analyst: MAR1  
Date: 11/27/2023  
Batch ID: 76478  
Matrix: DW

Method Blank Assessment	
MB Sample ID	3075666
MB concentration:	0.000
MB Counting Uncertainty:	0.241
MB MDC:	0.540
MB Numerical Performance Indicator:	0.00
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCS/D (Y or N)?	
	LCS76478	YCS76478
Count Date:	12/7/2023	12/7/2023
Spike I.D.:	23-013	23-013
Spike Concentration (pCi/mL):	32.279	32.279
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.651	0.653
Target Conc. (pCi/L, g, F):	4.958	4.943
Uncertainty (Calculated):	0.233	0.232
Result (pCi/L, g, F):	5.794	4.692
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.139	0.973
Numerical Performance Indicator:	1.41	-0.49
Percent Recovery:	116.86%	94.92%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	133%	133%
Lower % Recovery Limits:	73%	73%

Duplicate Sample Assessment	Matrix Spike/Matrix Spike Duplicate Sample Assessment
Sample I.D.:	Sample I.D.:
Duplicate Sample I.D.:	Sample MS I.D.:
Sample Result (pCi/L, g, F):	Sample MS Result:
Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:
Sample Duplicate Result (pCi/L, g, F):	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:
Are sample and/or duplicate results below RL?	Sample Matrix Spike Duplicate Counting Uncertainty (pCi/L, g, F):
Duplicate Numerical Performance Indicator:	Duplicate Numerical Performance Indicator:
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs Numerical Indicator:
Duplicate Status vs RPD:	MS/MSD Duplicate Status vs RPD:
% RPD Limit:	% RPD Limit:

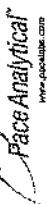
## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

LL 12 07 23

VAM 12/17/23

# Quality Control Sample Performance Assessment



Analyst Must Manually Enter All Fields Highlighted in Yellow.

Test: Ra-228  
Analyst: JJS1  
Date: 11/29/2023  
Worklist: 76479  
Matrix: WT

Method Blank Assessment	
MB Sample ID	3075669
MB concentration:	0.284
MB 2 Sigma CSU:	0.361
MB MDC:	0.763
MB Numerical Performance Indicator:	1.54
MB Status vs Numerical Indicator:	Pass
MB Status vs MDC:	Pass

Laboratory Control Sample Assessment	
LCS# (Y or N)?	Y
LCS76479	LCS76479
Count Date:	12/4/2023
Spike I.D.:	23-043
Decay Corrected Spike Concentration (pCi/mL):	38.775
Volume Used (mL):	0.10
Aliquot Volume (L, g, F):	0.817
Target Conc. (pCi/L, g, F):	4.744
Uncertainty (Calculated):	0.232
Result (pCi/L, g, F):	5.091
LCSA/LCSD 2 Sigma CSU (pCi/L, g, F):	1.134
Numerical Performance Indicator:	1.17
Percent Recovery:	115.45%
Status vs Numerical Indicator:	N/A
Upper % Recovery Limits:	135%
Lower % Recovery Limits:	60%

Duplicate Sample Assessment	
Sample I.D.:	LCS76479
Duplicate Sample I.D.:	LCS76479
Sample Result (pCi/L, g, F):	5.434
Sample Duplicate Result (pCi/L, g, F):	1.197
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	5.091
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.134
Are sample and/or duplicate results below RL?	NO
Duplicate Numerical Performance Indicator:	0.409
Duplicate Percent Recoveries Duplicate RPD:	7.31%
Duplicate Status vs Numerical Indicator:	Pass
Duplicate Status vs RPD:	Pass
% RPD Limit:	36%

Sample Matrix Spike Control Assessment	
Sample Collection Date:	Sample I.D.
Sample MS I.D.:	Sample MS I.D.
Sample MSD I.D.:	Sample MSD I.D.
Sample I.D.:	Sample I.D.
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	Spike Volume Used in MS (mL):
Spike Volume Used in MSD (mL):	MS Aliquot (L, g, F):
MS Target Conc. (pCi/L, g, F):	MSD Aliquot (L, g, F):
MSD Target Conc. (pCi/L, g, F):	MSD Spike Uncertainty (calculated):
MS Spike Uncertainty (calculated):	MSD Spike Uncertainty (calculated):
Sample Result 2 Sigma CSU (pCi/L, g, F):	Sample Matrix Spike Result:
Sample Matrix Spike Duplicate Result:	Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	MS Numerical Performance Indicator:
MS Numerical Performance Indicator:	MS Percent Recovery:
MS Percent Recovery:	MSD Percent Recovery:
MS Status vs Numerical Indicator:	MS Status vs Numerical Indicator:
MSD Status vs Numerical Indicator:	MS/MSD Upper % Recovery Limits:
MS/MSD Upper % Recovery Limits:	MS/MSD Lower % Recovery Limits:

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	Sample I.D.
Sample MS I.D.:	Sample MS I.D.
Sample MSD I.D.:	Sample MSD I.D.
Sample Matrix Spike Result:	Sample Matrix Spike Duplicate Result:
Sample Matrix Spike Duplicate Result:	Sample Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):
Sample Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	Duplicate Numerical Performance Indicator:
Duplicate Numerical Performance Indicator:	(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs RPD:
MS/MSD Duplicate Status vs RPD:	% RPD Limit:

# Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*Handwritten notes:*  
VAC  
12/5/23  
12/5/23



## Certificate of Analysis 3112898

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 11/20/2023 15:46

Project Name: Green Landfill Arsenic Wells

Workorder: 3112898

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/08/2023 14:20.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3112898-01	MW-106S/MW-106S	Groundwater	11/07/2023 14:00	11/08/2023 14:20	Eric Brown
3112898-02	MW-106D/MW-106D	Groundwater	11/07/2023 13:05	11/08/2023 14:20	Eric Brown
3112898-03	MW-105/MW-105	Groundwater	11/08/2023 11:55	11/08/2023 14:20	Eric Brown

**ANALYTICAL RESULTS**

Lab Sample ID: **3112898-01**  
Description: **MW-106S MW-106S**

Sample Collection Date Time: 11/07/2023 14:00  
Sample Received Date Time: 11/08/2023 14:20

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Arsenic	0.0832		mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:54	AKB

**ANALYTICAL RESULTS**

Lab Sample ID: **3112898-02**  
Description: **MW-106D MW-106D**

Sample Collection Date Time: 11/07/2023 13:05  
Sample Received Date Time: 11/08/2023 14:20

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Arsenic	0.0012		mg/L	0.0010	0.0004	SW846-6020 A	11/13/2023 08:43	11/16/2023 16:01	AKB

**ANALYTICAL RESULTS**

Lab Sample ID: **3112898-03**  
Description: **MW-105 MW-105**

Sample Collection Date Time: 11/08/2023 11:55  
Sample Received Date Time: 11/08/2023 14:20

Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Arsenic	0.0103		mg/L	0.0010	0.0004	SW846-6020 A	11/10/2023 09:07	11/13/2023 17:58	AKB



**Notes for work order 3112898**

- 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**

- D2          Sample required dilution due to matrix interference.
- 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/Acronyms**

- 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



**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
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**Batch BCK0852 - EPA 200.2**

**Blank (BCK0852-BLK1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:34

Arsenic	ND	0.0010	mg/L							U
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**LCS (BCK0852-BS1)**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 16:37

Arsenic	0.0605	0.0010	mg/L	0.0625		96.9	85-115			
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**Matrix Spike (BCK0852-MS1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:01

Arsenic	0.0637	0.0010	mg/L	0.0625	ND	102	80-120			
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**Matrix Spike (BCK0852-MS2) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:09

Arsenic	0.0652	0.0010	mg/L	0.0625	ND	104	80-120			
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**Matrix Spike Dup (BCK0852-MSD1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:05

Arsenic	0.0626	0.0010	mg/L	0.0625	ND	100	80-120	1.81	20	
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**Matrix Spike Dup (BCK0852-MSD2) Source: 3111624-06**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:12

Arsenic	0.0662	0.0010	mg/L	0.0625	ND	106	80-120	1.49	20	
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**Post Spike (BCK0852-PS1) Source: 3111623-01**

Prepared: 11/10/2023 9:07, Analyzed: 11/13/2023 18:16

Arsenic	0.0632	0.0010	mg/L	0.0625	ND	101	75-125			
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**Batch BCK1114 - EPA 200.2**

**Blank (BCK1114-BLK2)**

Prepared: 11/13/2023 8:43, Analyzed: 11/16/2023 15:51

Arsenic	ND	0.0010	mg/L							U
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**LCS (BCK1114-BS2)**

Prepared: 11/13/2023 8:43, Analyzed: 11/16/2023 15:54

Arsenic	61.8		ug/L	62.5		98.8	85-115			
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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
<b>Batch BCK1114 - EPA 200.2</b>										
<b>Matrix Spike (BCK1114-MS2)</b>		<b>Source: 3110769-01</b>								
Prepared: 11/13/2023 8:43, Analyzed: 11/16/2023 16:48										
Arsenic	62.3		ug/L	62.5	0.115	99.5	80-120			D2
<b>Matrix Spike Dup (BCK1114-MSD2)</b>		<b>Source: 3110769-01</b>								
Prepared: 11/13/2023 8:43, Analyzed: 11/16/2023 16:52										
Arsenic	63.3		ug/L	62.5	0.115	101	80-120	1.55	20	D2
<b>Post Spike (BCK1114-PS2)</b>		<b>Source: 3110769-01</b>								
Prepared: 11/13/2023 8:43, Analyzed: 11/16/2023 16:56										
Arsenic	62.9		ug/L	62.5	0.115	100	75-125			D2

**Sample Acceptance Checklist for Work Order 3112898**

Shipped By: Client

Temperature: 3.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

LAB USE ONLY - ARI's Workorder Login Label Here

3112898

Scan QR Code for Instructions



**CHAIN-OF-CUSTODY Analytical Request Document**

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

Pace<sup>®</sup> Location Requested (City/State):

Pace

Company Name: Big Rivers  
 Street Address: Sebrice Green  
 Contact/Report To:  
 Phone #: \_\_\_\_\_  
 E-Mail: \_\_\_\_\_  
 Cx E-Mail: \_\_\_\_\_

Customer Project #: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Invoice to: \_\_\_\_\_  
 Invoice Email: \_\_\_\_\_  
 Purchase Order # (if applicable): \_\_\_\_\_  
 Quote #: \_\_\_\_\_

Site Collection Info/Facility ID (as applicable): \_\_\_\_\_  
 Regulatory Program (DW, RCRA, etc.) as applicable: \_\_\_\_\_  
 County / State or origin of Sample(s): \_\_\_\_\_

Date Deliverables: [ ] Level I [ ] Level II [ ] Level III [ ] Level IV [ ] Level V [ ] Other [ ]  
 Rush (Pre-approval required): [ ] 12 Day [ ] 5 day [ ] 3 day [ ] Other [ ]  
 Date Results Requested: \_\_\_\_\_  
 Field Filtered (if applicable): [ ] Yes [ ] No  
 Analysis: \_\_\_\_\_

\* Matrix Coder (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SS), Oil (OI), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Other (OT), Surface Water (SW), Sediment (SD), Sludge (SU), Caulk

Matrix	Customer Sample ID	Comp / Gmb	CONCRETE for Composite Start Date	Time	Composite End Date	Res. CLZ	Number & Type of Containers PLASTIC GLASS
GW	MW-105	GW	11/7/23	1400			1
GW	MW-106S	GW	11/7/23	1305			1
GW	MW-106D	GW	11/7/23	1305			1
GW	MW-105	GW	11/8/23	1155			1

Thermometer Serial Number

/ 181390287

181460057

Temp 30°C

Customer Remarks / Special Conditions / Possible Hazards:

Collected By: Eric Brown  
 Printed Name: \_\_\_\_\_  
 Signature: Eric Brown

Received by Company: Eric Brown  
 Date/Time: 11/8/23 14:20

Received by Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

Received by Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

Received by Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

Received by Company: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

Additional Instructions from Pace:  
 a. Coasters: \_\_\_\_\_ Thermometer ID: \_\_\_\_\_ Correction Factor (C): \_\_\_\_\_ Obs. Temp. (C): \_\_\_\_\_ Connected Items (CI): \_\_\_\_\_  
 Tracking Number: \_\_\_\_\_  
 Delivered by: [ ] In-Person [ ] Courier [ ] FedEx [ ] UPS [ ] Other  
 Page: \_\_\_\_\_ of \_\_\_\_\_

**APPENDIX G - GREEN SURFACE IMPOUNDMENT LABORATORY  
ANALYTICAL REPORTS**

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## Certificate of Analysis 3061148

Greg Dick  
Big Rivers Electric Corporation Reid/Green Station  
PO Box 24  
Henderson, KY 42419

Customer ID: 44-102032  
Report Printed: 07/10/2023 10:21

Project Name: Green Surface Impoundment

Workorder: 3061148

Dear Greg Dick

Enclosed are the analytical results for samples received by the laboratory 06/26/2023 12:14.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3061148-01	MW11/	Groundwater	06/25/2023 07:55	06/26/2023 12:14	Greg Dick
3061148-02	MW12/	Groundwater	06/25/2023 11:20	06/26/2023 12:14	Greg Dick
3061148-03	MW13/	Groundwater	06/25/2023 09:30	06/26/2023 12:14	Greg Dick
3061148-04	MW14/	Groundwater	06/25/2023 08:45	06/26/2023 12:14	Greg Dick
3061148-05	DUPLICATE/	Groundwater	06/25/2023 09:00	06/26/2023 12:14	Greg Dick
3061148-06	FIELD BLANK/	Water	06/25/2023 11:45	06/26/2023 12:14	Greg Dick

LabNumber	Measurement	Value
3061148-01	Field Conductance	5610
	Field pH	6.87
	Field Temp (C)	17.49
3061148-02	Field Conductance	919
	Field pH	6.90
	Field Temp (C)	21.55
3061148-03	Field Conductance	1160
	Field pH	6.65
	Field Temp (C)	21.70
3061148-04	Field Conductance	1630
	Field pH	6.69
	Field Temp (C)	18.90

**Work Order Comments:**

**Corrected Report:**

This report has been issued as a revision of the previous report dated 7/5/23@1553. Collection date corrected.



### ANALYTICAL RESULTS

Lab Sample ID: **3061148-01**  
Description: **MW11**

Sample Collection Date Time: 06/25/2023 07:55  
Sample Received Date Time: 06/26/2023 12:14

#### Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.57		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 10:53	MRWD
Calcium	131	D1	mg/L	40.0	13.0	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:00	MRWD

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.53	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
Total Dissolved Solids	2960		mg/L	50	50	2540 C-2015	06/30/2023 13:02	06/30/2023 13:02	HAG

#### Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	1790	D	mg/L	25.0	18.0	SW846 9056	07/03/2023 01:40	07/03/2023 01:40	CSC
Fluoride	0.2		mg/L	0.2	0.2	SW846 9056	07/03/2023 01:13	07/03/2023 01:13	CSC
Sulfate	568	D	mg/L	50	25	SW846 9056	07/03/2023 01:40	07/03/2023 01:40	CSC

### ANALYTICAL RESULTS

Lab Sample ID: **3061148-02**  
Description: **MW12**

Sample Collection Date Time: 06/25/2023 11:20  
Sample Received Date Time: 06/26/2023 12:14

#### Metals by SW846 6000 Series Methods Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.31		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:03	MRWD
Calcium	94.3	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:06	MRWD

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.48	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
Total Dissolved Solids	608		mg/L	100	100	2540 C-2015	06/30/2023 13:02	06/30/2023 13:02	HAG

#### Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	9.5		mg/L	0.5	0.4	SW846 9056	07/03/2023 02:08	07/03/2023 02:08	CSC
Fluoride	0.4		mg/L	0.2	0.2	SW846 9056	07/03/2023 02:08	07/03/2023 02:08	CSC
Sulfate	4		mg/L	1	0.5	SW846 9056	07/03/2023 02:08	07/03/2023 02:08	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3061148-03**  
 Description: **MW13**

Sample Collection Date Time: 06/25/2023 09:30  
 Sample Received Date Time: 06/26/2023 12:14

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:22	MRWD
Calcium	94.0	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:25	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.24	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
Total Dissolved Solids	656		mg/L	100	100	2540 C-2015	06/30/2023 13:02	06/30/2023 13:02	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	21.0		mg/L	0.5	0.4	SW846 9056	07/03/2023 02:35	07/03/2023 02:35	CSC
Fluoride	0.2		mg/L	0.2	0.2	SW846 9056	07/03/2023 02:35	07/03/2023 02:35	CSC
Sulfate	77		mg/L	1	0.5	SW846 9056	07/03/2023 02:35	07/03/2023 02:35	CSC

**ANALYTICAL RESULTS**

Lab Sample ID: **3061148-04**  
 Description: **MW14**

Sample Collection Date Time: 06/25/2023 08:45  
 Sample Received Date Time: 06/26/2023 12:14

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:31	MRWD
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	07/03/2023 09:56	07/05/2023 11:31	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.24	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
Total Dissolved Solids	992		mg/L	100	100	2540 C-2015	06/30/2023 13:02	06/30/2023 13:02	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	107		mg/L	0.5	0.4	SW846 9056	07/03/2023 03:02	07/03/2023 03:02	CSC
Fluoride	0.3		mg/L	0.2	0.2	SW846 9056	07/03/2023 03:02	07/03/2023 03:02	CSC
Sulfate	184		mg/L	1	0.5	SW846 9056	07/03/2023 03:02	07/03/2023 03:02	CSC





ANALYTICAL RESULTS

Lab Sample ID: 3061148-05

Sample Collection Date Time: 06/25/2023 09:00

Description: DUPLICATE

Sample Received Date Time: 06/26/2023 12:14

Metals by SW846 6000 Series Methods Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for Boron and Calcium.

Conventional Chemistry Analyses Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for pH (Lab) and Total Dissolved Solids.

Ion Chromatography Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for Chloride, Fluoride, and Sulfate.

ANALYTICAL RESULTS

Lab Sample ID: 3061148-06

Sample Collection Date Time: 06/25/2023 11:45

Description: FIELD BLANK

Sample Received Date Time: 06/26/2023 12:14

Metals by SW846 6000 Series Methods Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for Boron and Calcium.

Conventional Chemistry Analyses Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for pH (Lab) and Total Dissolved Solids.

Ion Chromatography Madisonville

Table with 10 columns: Analyte, Result, Flag, Units, MRL, MDL, Method, Prepared, Analyzed, Analyst. Rows for Chloride, Fluoride, and Sulfate.



**Notes for work order 3061148**

- 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**

- D Results reported from dilution.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- H1 Sample analysis performed past holding time.
- H3 Sample received and analyzed past holding time.
- 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/Acronyms**

- 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



**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
<b>Batch BCG0024 - EPA 200.2</b>										
<b>Blank (BCG0024-BLK1)</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:44										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
<b>LCS (BCG0024-BS1)</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:47										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.32	0.40	mg/L	6.25		101	85-115			
<b>Matrix Spike (BCG0024-MS1) Source: 3032610-01</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:09										
Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	160	4.00	mg/L	6.25	152	123	80-120			D2, M3
<b>Matrix Spike (BCG0024-MS2) Source: 3032611-06</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:16										
Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	8.40	4.00	mg/L	6.25	ND	134	80-120			D2, M1
<b>Matrix Spike Dup (BCG0024-MSD1) Source: 3032610-01</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:13										
Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	165	4.00	mg/L	6.25	152	214	80-120	3.48	20	D2, M3
<b>Matrix Spike Dup (BCG0024-MSD2) Source: 3032611-06</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:19										
Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	7.31	4.00	mg/L	6.25	ND	117	80-120	13.9	20	D2
<b>Post Spike (BCG0024-PS1) Source: 3032610-01</b>										
Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:22										
Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	173	4.00	mg/L	6.25	152	340	75-125			D2, M3



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCF2697 - Default Prep Micro</b>										
<b>LCS (BCF2697-BS1)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.96		Std. Units	5.00		99.2	98.8-101.2			
<b>LCS (BCF2697-BS2)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.99		Std. Units	5.00		99.8	98.8-101.2			
<b>Duplicate (BCF2697-DUP1) Source: 3032611-06</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	5.79	0.10	Std. Units		5.84			0.860	10	H3
<b>Duplicate (BCF2697-DUP2) Source: 3064450-01</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	9.64	0.10	Std. Units		9.64			0.00	10	H3
<b>Batch BCF2798 - Default Prep Wet Chem</b>										
<b>Blank (BCF2798-BLK1)</b>										
Prepared: 6/30/2023 13:02, Analyzed: 6/30/2023 13:02										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCF2798-BS1)</b>										
Prepared: 6/30/2023 13:02, Analyzed: 6/30/2023 13:02										
Total Dissolved Solids	1490	25	mg/L	1500		99.3	80-120			
<b>Duplicate (BCF2798-DUP1) Source: 3061148-01</b>										
Prepared: 6/30/2023 13:02, Analyzed: 6/30/2023 13:02										
Total Dissolved Solids	2970	50	mg/L		2960			0.202	10	
<b>Duplicate (BCF2798-DUP2) Source: 3064431-04</b>										
Prepared: 6/30/2023 13:02, Analyzed: 6/30/2023 13:02										
Total Dissolved Solids	1200	50	mg/L		1190			0.502	10	H1



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0015 - Default Prep IC**

**Matrix Spike (BCG0015-MS1) Source: 3061148-06**

Prepared: 7/3/2023 6:14, Analyzed: 7/3/2023 6:14

Chloride	15.5		mg/L	12.5	0.0	124	75-125			
Fluoride	6.6		mg/L	5.00	0.0	132	75-125			M1
Sulfate	31		mg/L	25.0	0.2	125	75-125			

**Matrix Spike Dup (BCG0015-MSD1) Source: 3061148-06**

Prepared: 7/3/2023 6:42, Analyzed: 7/3/2023 6:42

Chloride	14.8		mg/L	12.5	0.0	119	75-125	4.39	15	
Fluoride	6.1		mg/L	5.00	0.0	121	75-125	8.30	15	
Sulfate	31		mg/L	25.0	0.2	125	75-125	0.523	15	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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
<b>4500-H+ B-2000 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)

**Sample Acceptance Checklist for Work Order 3061148**

Shipped By: Client

Temperature: 5.70° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148-01 A	06/25/23	0755	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-01 B	06/25/23	0755	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-01 C	06/25/23	0755	Plastic 1L	1	MW11	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-02 A	06/25/23	1120	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-02 B	06/25/23	1120	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-02 C	06/25/23	1120	Plastic 1L	1	MW12	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: KED

Field data collected by: <u>Greg Dick</u>	Date (mm/dd/yy): <u>06/25/23</u>	Time (24 hr): <u>0755</u>	<u>MW-11</u>	<u>MW-12</u>
pH: <u>6.87</u> / <u>6.90</u>	Cond (umho): <u>5610</u> / <u>919</u>	Res Cl (mg/L): _____	Tot Cl (mg/L): _____	Free Cl (mg/L): _____
Temp (oC): <u>7.49</u> / <u>21.55</u> or (oF): _____	Static Water Level: _____	DO (mg/L): _____	Turb. (NTU): _____	
Flow (MGD): _____ or (CFS): _____ or (g/min): _____				

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1214

# Chain of Custody

Scheduled for: **06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

**\*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148-03 A	<u>06/25/23</u>	<u>0930</u>	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-03 B	<u>06/25/23</u>	<u>0930</u>	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-03 C	<u>06/25/23</u>	<u>0930</u>	Plastic 1L	1	MW13	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-04 A	<u>06/25/23</u>	<u>0845</u>	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-04 B	<u>06/25/23</u>	<u>0845</u>	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-04 C	<u>06/25/23</u>	<u>0845</u>	Plastic 1L	1	MW14	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-05 A	<u>06/25/23</u>	<u>0900</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			

Preservation Check Performed by: KED

Field data collected by: <u>Greg Dick</u>	Date (mm/dd/yy): <u>06/25/23</u>	Time (24 hr): <u>0930</u>   <u>0845</u>
pH: <u>6.65</u>   <u>6.69</u>	Cond (umho): <u>1160</u>   <u>1160</u>	Res Cl (mg/L) _____
Temp (oC): <u>21.70</u>   <u>18.90</u>	Static Water Level _____	DO (mg/L) _____
Flow (MGD) _____	Turb. (NTU) _____	

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1214



# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick \*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**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148-05 B	06/25/23	0900	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-05 C	06/25/23	0900	Plastic 1L	1	DUPLICATE	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-06 A	06/25/23	1145	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-06 B	06/25/23	1145	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-06 C	06/25/23	1145	Plastic 1L	1	FIELD BLANK	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: KED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) <u>Greg Dick</u>	Received by: (Signature) <u>KED</u>	Date (mm/dd/yy) <u>06/26/23</u>	Time (24 hr) <u>1214</u>
--	--	------------------------------------	-----------------------------

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3061148 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148-01 A	<u>06/25/23</u>	<u>0755</u>	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-01 B	<u>06/25/23</u>	<u>0755</u>	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-01 C	<u>06/25/23</u>	<u>0755</u>	Plastic 1L	1	MW11	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-02 A	<u>06/25/23</u>	<u>1120</u>	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-02 B	<u>06/25/23</u>	<u>1120</u>	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH:	<input checked="" type="checkbox"/>			
3061148-02 C	<u>06/25/23</u>	<u>1120</u>	Plastic 1L	1	MW12	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: KED

Field data collected by: <u>Greg Dick</u>	Date (mm/dd/yy) <u>06/25/23</u>	Time (24 hr) <u>0755</u>	<u>MW-11</u>	<u>MW-12</u>
pH <u>6.87</u> <u>6.90</u>	Cond (umho) <u>5610</u> <u>919</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____	Free Cl (mg/L) _____
Temp (oC) <u>17.49</u> <u>21.55</u> or (oF) _____	Static Water Level _____	DO (mg/L) _____	Turb. (NTU) _____	
Flow (MGD) _____ or (CFS) _____ or (g/min) _____				

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1214

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

Greg Dick  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

**\*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148 Sample ID#							
3061148-03 A	06/25/23	0930	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
				Preservation Check: pH :	<input checked="" type="checkbox"/>		
3061148-03 B	06/25/23	0930	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
				Preservation Check: pH :	<input checked="" type="checkbox"/>		
3061148-03 C	06/25/23	0930	Plastic 1L	1	MW13	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-04 A	06/25/23	0845	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
				Preservation Check: pH :	<input checked="" type="checkbox"/>		
3061148-04 B	06/25/23	0845	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
				Preservation Check: pH :	<input checked="" type="checkbox"/>		
3061148-04 C	06/25/23	0845	Plastic 1L	1	MW14	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-05 A	06/25/23	0900	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
				Preservation Check: pH :	<input checked="" type="checkbox"/>		

Preservation Check Performed by: KED

Field data collected by: <u>Greg Dick</u> <u>gh Dick</u>	Date (mm/dd/yy): <u>06/25/23</u>	Time (24 hr): <u>0930</u>   <u>0845</u>
pH: <u>6.65</u>   <u>6.69</u>	Cond (umho): <u>1160</u>   <u>11630</u>	Res Cl (mg/L) _____
Temp (oC): <u>21.70</u>   <u>18.90</u>	Static Water Level _____	DO (mg/L) _____
Flow (MGD) _____	Turb. (NTU) _____	Free Cl (mg/L) _____

Relinquished by: (Signature) Greg Dick Received by: (Signature) KED Date (mm/dd/yy) 06/26/23 Time (24 hr) 1214

# Chain of Custody

**Scheduled for: 06/05/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: Green Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [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 # 3061148 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3061148-05 B	<u>06/25/23</u>	<u>0900</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-05 C	<u>06/25/23</u>	<u>0900</u>	Plastic 1L	1	DUPLICATE	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3061148-06 A	<u>06/25/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-06 B	<u>06/25/23</u>	<u>1145</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3061148-06 C	<u>06/25/23</u>	<u>1145</u>	Plastic 1L	1	FIELD BLANK	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: [Signature]

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 06/26/23 Time (24 hr) 1214



## Certificate of Analysis 3111623

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 11/20/2023 15:52

Project Name: Green Surface Impoundment

Workorder: 3111623

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/08/2023 14:20.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3111623-01	MW11/	Groundwater	11/06/2023 16:15	11/08/2023 14:20	Eric Brown
3111623-02	MW12/	Groundwater	11/06/2023 15:25	11/08/2023 14:20	Eric Brown
3111623-03	MW13/	Groundwater	11/06/2023 12:30	11/08/2023 14:20	Eric Brown
3111623-04	MW14/	Groundwater	11/06/2023 13:30	11/08/2023 14:20	Eric Brown
3111623-05	DUPLICATE/	Groundwater	11/06/2023 13:45	11/08/2023 14:20	Eric Brown
3111623-06	FIELD BLANK/	Water	11/06/2023 15:35	11/08/2023 14:20	Eric Brown

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
3111623-01	Field Conductance	4230
	Field pH	6.81
	Field Temp (C)	18.04
3111623-02	Field Conductance	609
	Field pH	7.33
	Field Temp (C)	18.47
3111623-03	Field Conductance	843
	Field pH	6.58
	Field Temp (C)	18.34
3111623-04	Field Conductance	1010
	Field pH	6.70
	Field Temp (C)	18.47



**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-01**  
Description: **MW11**

Sample Collection Date Time: 11/06/2023 16:15  
Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.44	M2	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:07	MRWD
Calcium	221	D1, M3	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:23	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.60	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	4340		mg/L	250	250	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	2060	D	mg/L	25.0	18.0	SW846 9056	11/11/2023 04:07	11/11/2023 04:07	CSC
Fluoride	0.2		mg/L	0.2	0.2	SW846 9056	11/11/2023 03:12	11/11/2023 03:12	CSC
Sulfate	855	D	mg/L	50	25	SW846 9056	11/11/2023 04:07	11/11/2023 04:07	CSC

**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-02**  
Description: **MW12**

Sample Collection Date Time: 11/06/2023 15:25  
Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.24		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:26	MRWD
Calcium	77.2	D1	mg/L	4.00	1.30	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:29	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	8.06	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	568		mg/L	100	100	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	20.3		mg/L	0.5	0.4	SW846 9056	11/11/2023 04:35	11/11/2023 04:35	CSC
Fluoride	0.5		mg/L	0.2	0.2	SW846 9056	11/11/2023 04:35	11/11/2023 04:35	CSC
Sulfate	64		mg/L	1	0.5	SW846 9056	11/11/2023 04:35	11/11/2023 04:35	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-03**  
 Description: **MW13**

Sample Collection Date Time: 11/06/2023 12:30  
 Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:36	MRWD
Calcium	95.6	D1	mg/L	4.00	1.30	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:39	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.37	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	752		mg/L	100	100	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	27.1		mg/L	0.5	0.4	SW846 9056	11/11/2023 05:02	11/11/2023 05:02	CSC
Fluoride	0.2		mg/L	0.2	0.2	SW846 9056	11/11/2023 05:02	11/11/2023 05:02	CSC
Sulfate	100		mg/L	1	0.5	SW846 9056	11/11/2023 05:02	11/11/2023 05:02	CSC

**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-04**  
 Description: **MW14**

Sample Collection Date Time: 11/06/2023 13:30  
 Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.13		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 14:45	MRWD
Calcium	155	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:01	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.57	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	940		mg/L	100	100	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	104		mg/L	0.5	0.4	SW846 9056	11/11/2023 05:30	11/11/2023 05:30	CSC
Fluoride	0.3		mg/L	0.2	0.2	SW846 9056	11/11/2023 05:30	11/11/2023 05:30	CSC
Sulfate	176		mg/L	1	0.5	SW846 9056	11/11/2023 05:30	11/11/2023 05:30	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-05**  
Description: **DUPLICATE**

Sample Collection Date Time: 11/06/2023 13:45  
Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	0.13		mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:04	MRWD
Calcium	158	D1	mg/L	40.0	13.0	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:10	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	7.42	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	988		mg/L	100	100	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	105		mg/L	0.5	0.4	SW846 9056	11/11/2023 06:24	11/11/2023 06:24	CSC
Fluoride	0.3		mg/L	0.2	0.2	SW846 9056	11/11/2023 06:24	11/11/2023 06:24	CSC
Sulfate	178		mg/L	1	0.5	SW846 9056	11/11/2023 06:24	11/11/2023 06:24	CSC

**ANALYTICAL RESULTS**

Lab Sample ID: **3111623-06**  
Description: **FIELD BLANK**

Sample Collection Date Time: 11/06/2023 15:35  
Sample Received Date Time: 11/08/2023 14:20

**Metals by SW846 6000 Series Methods Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:14	MRWD
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	11/10/2023 09:07	11/15/2023 15:14	MRWD

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	5.76	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/09/2023 08:55	11/09/2023 15:38	AED
Total Dissolved Solids	88		mg/L	50	50	2540 C-2015	11/09/2023 15:44	11/09/2023 15:44	HAG

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	u	mg/L	0.5	0.4	SW846 9056	11/11/2023 07:19	11/11/2023 07:19	CSC
Fluoride	ND	u	mg/L	0.2	0.2	SW846 9056	11/11/2023 07:19	11/11/2023 07:19	CSC
Sulfate	0.7	J	mg/L	1	0.5	SW846 9056	11/11/2023 07:19	11/11/2023 07:19	CSC



**Notes for work order 3111623**

- 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**

- D Results reported from dilution.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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/Acronyms**

- 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



**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
<b>Batch BCK0852 - EPA 200.2</b>										
<b>Blank (BCK0852-BLK2)</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:01										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
<b>LCS (BCK0852-BS2)</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 14:04										
Boron	0.11	0.10	mg/L	0.125		88.9	85-115			
Calcium	5.71	0.40	mg/L	6.25		91.4	85-115			
<b>Matrix Spike (BCK0852-MS3) Source: 3111623-01</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:33										
Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, U, M2
Calcium	226	4.00	mg/L	6.25	221	81.5	80-120			D2
<b>Matrix Spike (BCK0852-MS4) Source: 3111624-06</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:39										
Boron	ND	1.00	mg/L	0.125	ND		80-120			U, D2, M2
Calcium	377	4.00	mg/L	6.25	375	24.5	80-120			D2, M3
<b>Matrix Spike Dup (BCK0852-MSD3) Source: 3111623-01</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:36										
Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	220	4.00	mg/L	6.25	221	NR	80-120	2.58	20	D2, M3
<b>Matrix Spike Dup (BCK0852-MSD4) Source: 3111624-06</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:43										
Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	374	4.00	mg/L	6.25	375	NR	80-120	0.676	20	D2, M3
<b>Post Spike (BCK0852-PS2) Source: 3111623-01</b>										
Prepared: 11/10/2023 9:07, Analyzed: 11/15/2023 17:46										
Boron	ND	1.00	mg/L	0.125	ND		75-125			M2, D2, U
Calcium	230	4.00	mg/L	6.25	221	149	75-125			D2



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCK0601 - Default Prep Micro</b>										
<b>LCS (BCK0601-BS1)</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	4.95		Std. Units	5.00		99.0	98.8-101.2			
<b>LCS (BCK0601-BS2)</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	5.09		Std. Units	5.00		102	98.8-101.2			H3
<b>Duplicate (BCK0601-DUP1) Source: 3111624-06</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	7.42	0.10	Std. Units		7.42			0.00	10	H3
<b>Duplicate (BCK0601-DUP2) Source: 3111623-01</b>										
Prepared: 11/9/2023 8:55, Analyzed: 11/9/2023 15:38										
pH (Lab)	7.62	0.10	Std. Units		7.60			0.263	10	H3
<b>Batch BCK0870 - Default Prep Wet Chem</b>										
<b>Blank (BCK0870-BLK1)</b>										
Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCK0870-BS1)</b>										
Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44										
Total Dissolved Solids	1480	25	mg/L	1500		98.5	80-120			
<b>Duplicate (BCK0870-DUP1) Source: 3111623-01</b>										
Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44										
Total Dissolved Solids	4460	250	mg/L		4340			2.73	10	
<b>Duplicate (BCK0870-DUP2) Source: 3111625-01</b>										
Prepared: 11/9/2023 15:44, Analyzed: 11/9/2023 15:44										
Total Dissolved Solids	5740	250	mg/L		5770			0.521	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK1030 - Default Prep IC**

**Blank (BCK1030-BLK1)**

Prepared: 11/11/2023 11:36, Analyzed: 11/11/2023 11:36

Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U

**LCS (BCK1030-BS1)**

Prepared: 11/11/2023 11:09, Analyzed: 11/11/2023 11:09

Fluoride	5.2		mg/L	5.00		104	90-110			
Chloride	12.6		mg/L	12.5		100	90-110			
Sulfate	25		mg/L	25.0		101	90-110			

**Matrix Spike (BCK1030-MS1) Source: 3111624-06**

Prepared: 11/11/2023 8:52, Analyzed: 11/11/2023 8:52

Fluoride	1.5		mg/L	5.00	0.4	21.3	75-125			M2
Chloride	140		mg/L	12.5	173	NR	75-125			M3
Sulfate	2200		mg/L	25.0	7630	NR	75-125			M3

**Matrix Spike (BCK1030-MS2) Source: 3111625-01**

Prepared: 11/11/2023 9:47, Analyzed: 11/11/2023 9:47

Chloride	1520		mg/L	12.5	2240	NR	75-125			M3
Fluoride	1.3		mg/L	5.00	0.3	19.3	75-125			M2
Sulfate	2090		mg/L	25.0	3770	NR	75-125			M3

**Matrix Spike Dup (BCK1030-MSD1) Source: 3111624-06**

Prepared: 11/11/2023 9:19, Analyzed: 11/11/2023 9:19

Fluoride	1.7		mg/L	5.00	0.4	24.2	75-125	9.09	15	M2
Chloride	138		mg/L	12.5	173	NR	75-125	1.87	15	M3
Sulfate	2160		mg/L	25.0	7630	NR	75-125	1.51	15	M3

**Matrix Spike Dup (BCK1030-MSD2) Source: 3111625-01**

Prepared: 11/11/2023 10:14, Analyzed: 11/11/2023 10:14

Chloride	1530		mg/L	12.5	2240	NR	75-125	0.502	15	M3
Fluoride	1.2		mg/L	5.00	0.3	18.6	75-125	2.73	15	M2
Sulfate	2100		mg/L	25.0	3770	NR	75-125	0.421	15	M3

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)



**Sample Acceptance Checklist for Work Order 3111623**

Shipped By: Client

Temperature: 3.00° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: **11/13/2023**



Client: **Big Rivers Electric Corporation**  
Reid/Green Station

Report To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Project: **Green Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#:

Please Print Legibly

Collected by (Signature): Eric Brown  
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 N/A End time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
3111623	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
3111623-01 A	<u>11/6/23</u>	<u>1615</u>	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-01 B	<u>11/6/23</u>	<u>1615</u>	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-01 C	<u>11/6/23</u>	<u>1615</u>	Plastic 1L	1	MW11	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3111623-02 A	<u>11/6/23</u>	<u>1525</u>	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: _____				
3111623-02 B	<u>11/6/23</u>	<u>1525</u>	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-02 C	<u>11/6/23</u>	<u>1525</u>	Plastic 1L	1	MW12	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: SW

Field data collected by: <u>Eric Brown</u>	Date (mm/dd/yy) <u>11/6/23</u>	Time (24 hr) <u>MW-11 1615</u>   <u>MW-12 1525</u>
pH <u>6.81</u>   <u>4.23</u>   <u>0.609</u>	Cond (umho) <u>7.33</u>   <u>NS</u>	Res Cl (mg/L) _____
Temp (oC) <u>18.04</u>   <u>18.47</u>	(oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
DO (mg/L) _____		Turb. (NTU) _____

Relinquished by: (Signature) Eric Brown Received by: (Signature) [Signature]  
Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

# Chain of Custody

Scheduled for: **11/13/2023**



Client: **Big Rivers Electric Corporation**  
**Reid/Green Station**

Report To:  
**Big Rivers Electric Corporation Reid/Green**  
**Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Invoice To:  
**Big Rivers Electric Corporation Reid/Green Station**  
**Mark Bertram**  
**9000 Highway 2096**  
**Robards, KY 42452**

Project: **Green Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Eric Brown*  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3111623 Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111623-03 A	<u>11/6/23</u>	<u>1230</u>	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>/</u>				
3111623-03 B	<u>11/6/23</u>	<u>1230</u>	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>/</u>				
3111623-03 C	<u>11/6/23</u>	<u>1230</u>	Plastic 1L	1	MW13	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3111623-04 A	<u>11/6/23</u>	<u>1330</u>	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: _____				
3111623-04 B	<u>11/6/23</u>	<u>1330</u>	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>/</u>				
3111623-04 C	<u>11/6/23</u>	<u>1330</u>	Plastic 1L	1	MW14	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3111623-05 A	<u>11/6/23</u>	<u>1345</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: _____				

Preservation Check Performed by: *SN*

Field data collected by: <u><i>Eric Brown</i></u>	Date (mm/dd/yy) <u>11/6/23</u>	Time (24 hr) <u>1230</u>	<u>MW-13</u>
pH <u>6.58</u>	Cond (µmho) <u>0.843</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
Temp (oC) <u>18.34</u>	or (oF) _____	Static Water Level _____	DO (mg/L) _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature) <u><i>Eric Brown</i></u>	Received by: (Signature) <u><i>[Signature]</i></u>	Date (mm/dd/yy) <u>11/8/23</u>	Time (24 hr) <u>1420</u>
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# Chain of Custody

**Scheduled for: 11/13/2023**



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** Green Surface Impoundment

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Eric Brown  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No X

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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3111623-05 B	<u>11/6/23</u>	<u>1345</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-05 C	<u>11/6/23</u>	<u>1345</u>	Plastic 1L	1	DUPLICATE	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
3111623-06 A	<u>11/6/23</u>	<u>1535</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-06 B	<u>11/6/23</u>	<u>1535</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH: <u>✓</u>				
3111623-06 C	<u>11/6/23</u>	<u>1535</u>	Plastic 1L	1	FIELD BLANK	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Thermometer Serial Number  
181390287  
181460057  
Temp 3.0 °C

Preservation Check Performed by: EW

Field data collected by: Eric Brown Date (mm/dd/yy) 11/6/23 Time (24 hr) 1330 MW-14

pH 6.70 Cond (ms) 1.01 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 18.47 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Eric Brown Received by: (Signature) [Signature] Date (mm/dd/yy) 11/8/23 Time (24 hr) 1420

## APPENDIX H - GREEN LANDFILL DATA VALIDATION

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# Memorandum



Date: October 30, 2023

To: Christopher Hoglund

From: Omkar Parab

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data  
Big Rivers Electric Company (BREC) - Sebree Station, Green Landfill Site,  
Webster County, Kentucky  
Project No. 159154

Groundwater samples were collected at the BREC Sebree Green Landfill Site in Webster County, Kentucky from June 22 to 24, 2023. The samples were analyzed by Pace Analytical Services of Madisonville, Kentucky (Pace Madisonville) for one or more of the following parameters:

Parameter	Analytical Method	Laboratory
Metals	SW846 6010 B SW846 6020 A	Pace - Madisonville
Total Organic Carbon (TOC)	5310 C-2014	
pH	4500-H+ B-2000	
Chemical Oxygen Demand (COD)	HACH Method 8000	
Total Dissolved Solids (TDS)	2540 C-2015	
Anions chloride, fluoride, sulfate	SW846 9056	Pace – Greensburg* *sister lab due to analytical capabilities
Radium-226	EPA 903.1	
Radium-228 *total calculated from radium-226 + radium-228 analyses.	EPA 904.0 Total Radium by calculation	

The following data sets were reviewed in support of this investigation:

Lab	SDG	Dates Collected	Matrix
Pace Analytical Services, LLC	3061146 3061147	06/22/2023 to 06/24/2023	Groundwater

SDG = sample delivery group

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 in Table 1.

1. Chain-of-Custody (COC) –The relinquished and received signatures, times, and dates were present on the COCs for all samples.
2. Requested Analyses Completed – All analyses were completed as requested.

# Memorandum *(continued)*



October 5, 2023

Page 2

3. Holding Times – The pH for all of the samples was analyzed outside the 24-hour holding time, and therefore, these results were qualified as estimated (J). The TDS for samples MW4, MW5, and MW6, was analyzed one day past the 7-day holding time. As such, these results were qualified as estimated (J). All other samples analyses were completed within their recommended holding time.
4. Sample Preservation – All samples were received by Pace-Madisonville within the preservation temperature range of 4 degrees Celsius ( $^{\circ}\text{C}$ ) +/-  $2^{\circ}\text{C}$ . Thermal preservation was not required for the radium samples.
5. Field Blank – Field blanks assess the potential for cross-contamination during the sample activities and/or transport. For this review, sample FIELD BLANK was associated with any samples collected on 06/24/2023, which included MW2 in SDG 3061146.

The following field blank detections were noted during this review:

- Copper, lead, and thallium were detected in this field blank. The associated sample was nondetect for these analytes, and no qualifiers were necessary.
  - Specific conductance was detected in this field blank. The associated sample was greater than five times the blank detection. As such, no qualifier was necessary.
  - TOC was detected in this field blank. Associated sample MW2 exhibited a detection over the reporting limit, but less than five times the field blank. Therefore, this result was qualified as estimated potential high bias (J+).
  - Radium 226, radium 228 and total radium exhibited detections in this field blank. The associated sample was qualified as estimated (J) for each of these analytes.
6. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses.
    - Radium: Radium-226 and radium-228 were detected in all method blanks. Because of the uncertainty associated with radium results, the review criteria were slightly altered to account for this. For any associated radium-226 or radium-228 detection less than five times the corresponding method blank concentration, 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 (except the field blank) were qualified and estimated (J) for the radium fractions.

Note, blanks are not typically qualified based on other blanks. Therefore, the field blank was excluded from this qualification.

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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. 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. Only site-specific MS/MSD results were evaluated during this review. The following site-specific MS/MSD results were outside their respective control limits:
  - SDG 3061146:
    - MS/MSD performed on sample MW1 (Lab ID 3061146-01):  
The MS/MSD RECs for boron and sodium were not reported, while the MSD REC for calcium was below its QC limit. Upon further review, it was found that the lab spike amounts for these metals were less than  $\frac{1}{4}$  the respective concentration of the parent sample. Therefore, the MS/MSD results for these analytes were inconclusive. The corresponding post digestive spike performed on this same sample also yielded the same inconclusive results due to not meeting the  $\frac{1}{4}$  spiking criteria. No data qualifiers were added.
    - MS/MSD performed on sample MW5 (Lab ID 3061146-05):  
The MS REC for TOC was below its QC limit. TOC was detected in the noted spiked sample, and was qualified as estimated biased low (J-).
    - MS/MSD performed on sample MW3 (Lab ID 3061146-03):  
The MS/MSD RECs for chloride and sulfate were not reported. Upon further review, it was noted the spike amounts were less than  $\frac{1}{4}$  the concentration of the parent sample for these analytes making the MS/MSD results inconclusive. No data qualifiers were added.
    - MS/MSD performed on sample FIELD BLANK (Lab ID 3061146-08):  
The MSD REC for fluoride was above its QC limit. Fluoride was non-detect in the noted spiked sample, and no qualifiers were added.



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- MS/MSD performed on sample FIELD BLANK (Lab ID 3061146-08):  
The MSD REC for radium-226 was below its QC limit. Radium-226 was detected in the noted spiked sample and 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).
- SDG 3061147:
  - All site-specific MS/MSD results in this SDG 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 the 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  $\pm$  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 1.50 for the radium samples.

The following field duplicate pair was included in this review.

MW3A // DUPLICATE: The field duplicate results for chloride were analyzed at different dilution factors. Therefore, no conclusions could be made regarding the reproducibility of the results and no qualifiers were added. A sensitivity test was applied to the boron results, and passed said test, and no qualifiers were necessary. COD 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.

# Memorandum *(continued)*



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The field duplicate pair exhibited variable differences in the radium results due to their associated uncertainty. As noted previously, all radium results were qualified estimated (J) for one or more reasons. As such, no further qualifiers were added for these results based solely on the field duplicate review.

All the other field duplicate data were adequately replicated.

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 (flagged D or D1 by the laboratory). RLs were adjusted accordingly, and no data qualifiers were added based on these dilutions.
12. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid for use, as qualified, in reporting the results of this groundwater monitoring event.

## Attachments

Table 1 – Data Qualifier Table

Table 2 – Field Duplicate Comparison

**Table 1  
Data Qualifier Table  
BREC Sebree Green Landfill - June 2023 Sampling Event  
Webster County, Kentucky**

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
<b>SDG: 3061146</b>					
4500-H+ B-2000	pH	MW1	3061146-01	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection
4500-H+ B-2001	pH	MW2	3061146-02	J	Holding time exceedance
5310 C-2014	TOC			J+	Field blank detection
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Field/Method blank detection
4500-H+ B-2003	pH	MW3A	3061146-03	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection
HACH 8000	COD			J	Parent/Field Duplicate Failed RPD test
4500-H+ B-2003	pH	MW4	3061146-04	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection
2540 C-2015	TDS			J	Holding time exceedance
4500-H+ B-2004	pH	MW5	3061146-05	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection
5310 C-2014	TOC			J-	MS REC < QC limit
2540 C-2015	TDS			J	Holding time exceedance
4500-H+ B-2005	pH			J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium	MW6	3061146-06	J	Method blank detection
2540 C-2015	TDS			J	Holding time exceedance
4500-H+ B-2006	pH	DUPLICATE	3061146-07	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection
HACH 8000	COD			J	Parent/Field Duplicate Failed RPD test
4500-H+ B-2005	pH	FIELD BLANK	3061146-08	J	Holding time exceedance
EPA 903.1 Total Radium	Radium 226 Total Radium			J	MSD REC < QC limit
<b>SDG: 3061147</b>					
4500-H+ B-2000	pH	MW-104	3061147-01	J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			J	Method blank detection

**Notes:**

- |  |                                   |
|--|-----------------------------------|
| COD = Chemical oxygen demand                               | REC = Percent recovery            |
| J = Qualified as estimated during data review              | RPD = Relative percent difference |
| J- = Qualified as estimated biased low during data review  | SDG = sample delivery group       |
| J+ = Qualified as estimated biased high during data review | TDS = Total Dissolved Solids      |
| MS/MSD = Matrix spike/Matrix spike duplicate               | TOC = Total organic carbon        |
| MW = Monitoring Well                                       |                                   |
| QC = Quality Control                                       |                                   |

**Table 2**  
**Field Duplicate Comparison**  
**BREC Sebree Green Landfill- June 2023 Sampling Event**  
**Webster County, Kentucky**

Sample ID: Lab ID: Date Sampled:	MW3A 3061146-03 6/23/2023	DUPLICATE 3061146-07 6/23/2023	Units	Meets QC
Barium	0.035	0.038	mg/L	Yes
Boron	0.30	0.32	mg/L	Yes
Calcium	531	515	mg/L	Yes
Chloride	1,820	4,460	mg/L	Dilution
Chemical Oxygen Demand	113 J	78 J	mg/L	No, (RPD 37%)
Specific Conductance (Lab)	8,260	8,340	umhos/cm	Yes
Fluoride	0.5	0.5	mg/L	Yes
Lithium	0.64	0.58	mg/L	Yes
pH (Lab)	7.82 J	7.87 J	Std. Unit	Yes
Sodium	354	334	mg/L	Yes
Sulfate	1,140	1,180	mg/L	Yes
Total Dissolved Solids	5,090	4,860	mg/L	Yes
Total Organic Carbon	0.6	0.7	mg/L	Yes
Radium 226 See Attached Subcontract Report	0.379 J	0.278 J	pCi/L	See Text
Radium 228 See Attached Subcontract Report	1.05 J	1.37 J	pCi/L	See Text
Total Radium See Attached Subcontract Report	1.43 J	1.65 J	pCi/L	See Text

**Notes:**

Dilution - differing dilutions, no conclusions can be made  
ID - Identification  
J = Qualified as estimated during data review  
mg/L - milligram per liter  
MW = Monitoring Well  
pCi/L = picoCurie per liter  
QC = Quality Control  
RPD = Relative percent difference  
Std. Unit = standard unit  
umhos/cm =micromhos per centimeter

# Memorandum



Date: December 13, 2023  
To: Christopher Hoggund  
From: Omkar Parab  
Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data  
Big Rivers Electric Company (BREC) - Sebree Station, Landfill Site,  
Webster County, Kentucky  
Project No. 159154

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Groundwater samples were collected at the BREC Sebree Landfill Site in Webster County, Kentucky on November 7 and 8, 2023. 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
Specific Conductance	2510 B-2011	
Total Dissolved Solids (TDS)	2540 C-2015	
Total Organic Carbon (TOC)	5310 C-2014	
Chemical Oxygen Demand (COD)	HACH Method 8000	
pH	SM 4500-H+B-2011	
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 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 in Table 1.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates were present on the COCs for all samples.
2. Requested Analyses Completed – All analyses were completed as requested.
3. Holding Times – The pH for all the samples was analyzed outside the 24-hour holding time, and therefore, these results were qualified as estimated (J). All the other samples/analyses were completed within their recommended holding time.
4. Sample Preservation – All samples were received by Pace-Madisonville within the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C. The radium samples sent to Pace Greensburg did not require thermal preservation.

# Memorandum *(continued)*



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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 11/08/2023, which included MW3A, MW6, and DUPLICATE. The following field blank detections were noted during this review:
  - Specific conductance was detected in the field blank (Lab ID: 3111624-08). All the associated sample detections for specific conductance were greater than five times the blank detection. No qualifiers were added.
  - Chloride and sulfate were detected in the field blank. All the associated sample detections for noted analytes were greater than five times the blank detection. No qualifiers were added.
  - Radium-226 and radium-228 were detected in the field blank (Lab ID: 3111624-08). Because of the uncertainty associated with radium results, the review criteria were slightly altered to account for this. The associated radium-226 or radium-228 detections were less than five times the field blank concentration plus/minus its uncertainty, and 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 samples were also 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:
  - Iron was detected in two method blanks reported for QC batch BCK0852. Samples MW1 and MW3A exhibited detections greater than the reporting limit (RL) but less than five times the blank concentrations. The noted analyte sample results were qualified as estimated potential high bias (J+). All other associated samples were either nondetect or greater than five times the blank detection.
  - Radium: Radium-226 and radium-228 were detected in all method blanks. Because of the uncertainty associated with radium results, the review criteria were 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 (except the field blank) were qualified and estimated (J) for the radium fractions. Note, several samples were previously qualified estimated (J) for the field blank detections. Note, blanks are not typically qualified based on other blanks. Therefore, the field blank was excluded from this qualification.

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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.  
All LCS RECs were within their respective QC limits, except for two LCS RECs of sodium in QC batch BCK0852. The LCS RECs were below the QC limit for sodium. Sodium was detected in all of the associated samples, and was qualified as estimated potential low bias (J-).
  
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 did not calculate a REC and no result was reported and accuracy and precision were assessed by review of LCS results. Only site-specific MS/MSD results were evaluated during this review. The following site-specific MS/MSD results were outside their respective control limits:
  - MS/MSD RECs performed on sample MW1 (Lab ID 3111624-01[noted RE1]):
    - The MS/MSD results for several metals were reported at a dilution, while the parent sample was not reported at a dilution. Therefore, no conclusions could be made regarding the accuracy of the MS/MSD results. No qualifiers were added.
    - The lab also performed a post-digestive spike (PDS) on the same sample. The RECs for sodium and calcium were reported as ‘NR’. The lab spike was less than  $\frac{1}{4}$  the concentration of the parent sample for these analytes, and the PDS results were inconclusive.
  
  - MS/MSD REC performed on sample MW6 (Lab ID 3111624-06):
    - The MS/MSD results for several metals were reported at a dilution, while the parent sample was not reported at a dilution. Therefore, no conclusions could be made regarding the accuracy of the MS/MSD results. No qualifiers were added.
    - The MS/MSD RECs for fluoride were below the control limits, as well as below the 30% NFGI QC limit. Because fluoride was detected in the parent spiked sample and it was qualified as estimated potential low bias (J-), rather than rejected (R)



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- The MS/MSD RECs for chloride and sulfate were reported as ‘NR’. The lab spike was less than  $\frac{1}{4}$  the concentration of the parent sample for calcium and sodium, and MS/MSD results were inconclusive.
  - MS/MSD REC performed on sample MW-104 (Lab ID 3111625-01):
    - The MS/MSD RECs for fluoride were below the control limits, as well as below the 30% NFGI QC limit. Because fluoride was detected in the parent spiked sample, it was qualified as estimated potential low bias (J-), rather than rejected (R)
    - The MS/MSD RECs for chloride and sulfate were reported as ‘NR’. The lab spike was less than  $\frac{1}{4}$  the concentration of the parent sample for calcium and sodium, and MS/MSD results were inconclusive.
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.
- For the laboratory duplicate analysis performed on site-specific sample MW5, TOC exhibited an elevated RPD. The noted analyte was detected at a concentration less than 5x the reporting limit, therefore, it was instead tested for a sensitivity test. It passed the test, and no qualifier was required.
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  $\pm$  the lower detection limit for water samples.

The following field duplicate pair was included in this review.

- MW3A // DUPLICATE: Chloride, sulfate and TDS did not meet the duplication criteria since they yielded elevated RPDs. As such, the parent/duplicate pair was qualified as estimated (J) for these analytes.

# Memorandum *(continued)*



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- General: The field duplicate pair exhibited variable differences in the radium results due to their associated uncertainty. As noted previously, all radium results were qualified estimated (J) for one or more reasons. As such, no further qualifiers were added for these results based solely on the field duplicate review.
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. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid for use, as qualified, in reporting the results of this groundwater monitoring event.

## Attachments

Table 1 – Data Qualifier Table

Table 2 – Field Duplicate Comparison

**Table 1**  
**Data Qualifier Table**  
**BREC Sebree Green Landfill - November 2023 Sampling Event**  
**Webster County, Kentucky**

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
SW846 6010 B	Iron	MW1	3111624-01	J+	Method blank detection
EPA 903.1	Radium 226			J	Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SM 4500-H+B-2011	pH			J	Holding time exceedance
EPA 903.1	Radium 226	MW2	3111624-02	J	Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SM 4500-H+B-2011	pH			J	Holding time exceedance
SW846 6010 B	Iron	MW3A	3111624-03	J+	Method blank detection
EPA 903.1	Radium 226			J	Field/Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SW846 9056	Chloride			J	Parent/ Duplicate failed RPD test
SW846 9056	Sulfate			J	
2540 C-2015	TDS	J			
SM 4500-H+B-2011	pH			J	Holding time exceedance
EPA 903.1	Radium 226	MW4	3111624-04	J	Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SM 4500-H+B-2011	pH			J	Holding time exceedance
EPA 903.1	Radium 226	MW5	3111624-05	J	Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SM 4500-H+B-2011	pH			J	Holding time exceedance
EPA 903.1	Radium 226	MW6	3111624-06	J	Field/Method blank detection
EPA 904.0	Radium 228				
Total Radium	Total Radium				
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SM 4500-H+B-2011	pH			J	Holding time exceedance
SW846 9056	Fluoride	J-	MS/MSD RECs < QC limits		
SM 4500-H+B-2011	pH	FIELD BLANK	3111624-08	J	Holding time exceedance

**Table 1**  
**Data Qualifier Table**  
**BREC Sebree Green Landfill - November 2023 Sampling Event**  
**Webster 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	DUPLICATE	3111624-07	J	Field/Method blank detection
SW846 6010 B	Sodium			J-	LCS REC < QC limit
SW846 9056	Chloride			J	Parent/ Duplicate failed RPD test
SW846 9056	Sulfate			J	
2540 C-2015	TDS			J	
SM 4500-H+B-2011	pH			J	Holding time exceedance
EPA 903.1 EPA 904.0 Total Radium	Radium 226 Radium 228 Total Radium			MW-104	3111625-01
SM 4500-H+B-2011	pH	J	Holding time exceedance		
SW846 6010 B	Sodium	J-	LCS REC < QC limit		
SW846 9056	Fluoride	J-	MS/MSD RECs < QC limits		

**Notes:**

- J = Qualified as estimated
- J- = Qualified as estimated potential low bias
- J+ = Qualified as estimated potential high bias
- LCS = Laboratory control sample
- MS = Matrix spike
- MW = Monitoring well
- QC = Quality control
- REC = Percent recovery
- RPD = Relative percent difference
- TDS = Total dissolved solids

**Table 2**  
**Field Duplicate Comparison**  
**BREC Sebree Green Landfill - November 2023 Sampling Event**  
**Webster County, Kentucky**

Sample ID: Lab ID: Date Sampled:	MW3A 3111624-03 11/8/2023	DUPLICATE 3111624-07 11/8/2023	Units	Meets QC
Barium	0.038	0.039	mg/L	Yes
Boron	0.31	0.3	mg/L	Yes
Calcium	475	471	mg/L	Yes
Lithium	0.71	0.74	mg/L	Yes
Sodium	301	331	mg/L	Yes
Chemical Oxygen Demand	105	110	mg/L	Yes
Chloride	1190 J	3090 J	mg/L	No, (RPD 89%)
Fluoride	0.4	0.4	mg/L	Yes
Iron	0.185 J+	0.1 U	mg/L	Yes
pH (Lab)	7.37 J	7.25 J	std. units	Yes
Radium 226 (sub)	1.00 J	-0.0683 J	pCi/L	See Text
Radium 228 (sub)	1.45 J	0.477 J	pCi/L	See Text
Radium Total (sub)	2.45 J	0.477 J	pCi/L	See Text
Specific Conductance (Lab)	6700	7440	umhos/cm	Yes
Sulfate	2530 J	1490 J	mg/L	No, (RPD 52%)
Total Dissolved Solids	3630 J	5290 J	mg/L	No, (RPD 37%)
Total Organic Carbon	0.6	0.7	mg/L	Yes

**Notes:**

- ID - Identification
- J = Qualified as estimated
- J+ = Qualified as estimated potential high bias
- mg/L - milligram per liter
- MW = Monitoring Well
- pCi/L = picoCurie per liter
- QC = Quality Control
- RPD = Relative percent difference
- std. unit = standard unit
- U = non-detect
- umhos/cm = microsiemens per centimeter

# Memorandum



Date: May 18, 2023  
To: Christopher Hoglund  
From: Omkar Parab  
Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data  
BREC Sebree, Webster County, Kentucky.  
Project No. 156465

---

Soil samples were collected at the BREC Sebree Landfill Site in Webster County, Kentucky on April 25, 26, and 27 2023. The samples were analyzed by Pace Analytical Services of Indianapolis, Indiana (Pace Indianapolis) for one or more of the following parameters:

Parameter	Analytical Method
Metals ICP Iron	EPA 6010
Metals SPLP Arsenic, Iron	Samples are prepped for SPLP by EPA 3010, then analyzed by EPA 6010
Metals ICPMS Arsenic	EPA 6020
Percent Moisture (used to determine dry weight reporting)	SM 2540G

\*Notes: EPA – Environmental Protection Agency; ICP – inductively coupled plasma; ICPMS – inductively coupled plasma/mass spectrometry; SPLP - Synthetic Precipitation Leaching Procedure

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 no qualifiers were added during this review.

1. Chain-of-Custody (COC) –The relinquished and received signatures, times, and dates were present on the COC for all samples.
2. Requested Analyses Completed – All analyses were completed as requested.
3. Holding Times – All samples/analyses were completed within their recommended holding time.
4. Sample Preservation – All samples were received within the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C.
5. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses. No detections of target analytes were reported in the method blanks.
6. 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

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analyte recovery, independent of field sample matrix interference. In some instances, the lab also performed laboratory control sample duplicates. All LCS RECs were within QC limits.

7. Matrix Spike/Matrix Spike Duplicates (MS/MSD) – MS/MSDs are typically run for organic and inorganic analyses. A sample is split into three portions (original, MS and MSD), and a known amount of a target analyte is added (spiked) to two portions (MS and MSD) of the sample. The results of these two portions are compared with each other for reproducibility using the 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.

- The MS/MSD performed on sample MW-105-31-32 (Lab ID- 50343859001) yielded SPLP MS/MSD RECs outside the QC limit for iron. Upon further review, it was observed that the lab spike amounts were less than  $\frac{1}{4}$  the concentration in the parent sample. As such, these MS/MSD results were inconclusive. No qualifiers were added.

Also on this same parent sample, the total arsenic MS/MSD results were outside control reasons for the same issue. No conclusion could be made, and no qualifiers were added.

The associated LCS results for each of these metals were within control limits, and no further review was necessary.

8. 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 50 percent for soil 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 two times  $\pm$  the lower detection limit for soil samples.

Note: Although the SPLP results are reported in aqueous units, they were collected as soil samples. Therefore, the soil field duplicate criteria were used for the field duplicate review.



# Memorandum *(continued)*



May 18, 2023

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The following field duplicate pair was included in this review, and detections are presented on Table 2:

- MW-106S-22-24// Dup-1 (collected 04/26/2023): All results were adequately replicated.
9. 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.
  10. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid for use, as reported, in reporting the results of this investigation.

## Attachment(s)

Table 1 – Field Duplicate Comparison – Detections Only

**Table 1  
Field Duplicate Comparison - Detections Only  
BREC Sebree - April 2023 Sampling Event  
Webster County, Kentucky**

Sample ID:	MW-106S-22-24	Dup-1	Units	Meets QC
Lab ID:	50343859005	50343859007		
Date:	4/26/2023	4/26/2023		
Compound				
<b>6010 MET ICP</b>				
Iron	17,800	15,500	mg/kg	Yes
<b>6010 MET ICP, SPLP</b>				
Arsenic	0.046	0.058	mg/L	Yes
Iron	152	189	mg/L	Yes
<b>6020 MET ICPMS</b>				
Arsenic	2.4	3.6	mg/kg	Yes
<b>Percent Moisture</b>				
Percent Moisture	19.6	20.2	%	Yes

**Notes:**

- ID - identification
- mg/L - milligrams per liter
- MW = monitoring well
- mg/kg = miligram per kilogram
- QC = quality control
- % = percentage
- ICP =inductively coupled plasma
- SPLP = synthetic precipitation leaching procedure
- ICPMS = inductively coupled plasma mass spectrometry

**APPENDIX I - GREEN SURFACE IMPOUNDMENT DATA  
VALIDATION**

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# Memorandum



Date: September 14, 2023

To: Christopher Hoglund

From: Omkar Parab

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data  
Big Rivers Electric Company (BREC) - Sebree Station, Surface Impoundment Site,  
Webster County, Kentucky  
Project No. 159154

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Groundwater samples were collected at the BREC Sebree Green Surface Impoundment Site in Webster County, Kentucky on June 25, 2023. The samples were analyzed by Pace Analytical Services of Madisonville, Kentucky (Pace Madisonville) for one or more of the following parameters:

Parameter	Analytical Method	Laboratory
Calcium	SW846 6010 B	Pace - Madisonville
Boron		
pH	4500-H+ B-2000	
Total Dissolved Solids (TDS)	2540 C-2015	
Anions chloride, fluoride, sulfate	SW846 9056	

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 in Table 1.

1. Chain-of-Custody (COC) –The relinquished and received signatures, times, and dates were present on the COCs for all samples.
2. Requested Analyses Completed – All analyses were completed as requested.
3. Holding Times – The pH for all the samples was analyzed outside the 24-hour holding time, and therefore, these results were qualified as estimated (J). All the other samples/analyses were completed within their recommended holding time.
4. Sample Preservation – All samples were received by Pace-Madisonville within the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C.
5. Field Blank – Field blanks assess the potential for cross-contamination during the sample activities and/or transport.

No detections of target analytes were noted in the field blank.

# Memorandum *(continued)*



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6. Method Blanks – Method blanks assess the potential for cross-contamination during the sample preparation and/or analyses.

No detections of target analytes were noted in the method blank.

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.

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 did not calculate a REC and no result was reported and accuracy and precision were assessed by review of LCS results. Only site-specific MS/MSD results were evaluated during this review. The following site-specific MS/MSD results were outside their respective control limits:

- MS/MSD REC performed on sample field blank (Lab ID 3061148-06):
  - The MS REC for fluoride was above the control limits. The fluoride was nondetect in the parent sample and no qualifiers were added.

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 the 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?

# Memorandum *(continued)*



September 14, 2023

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- 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  $\pm$  the lower detection limit for water samples.

The following field duplicate pair was included in this review.

- MW14 // DUPLICATE: The field duplicate results for calcium were analyzed at different dilution factors. Therefore, no conclusions could be made regarding the reproducibility of the results and no qualifiers were added. A sensitivity test was applied to the fluoride and boron results, which they passed said test, and no qualifiers were necessary. All the other field duplicate data were adequately replicated.
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. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid for use, as qualified, in reporting the results of this groundwater monitoring event.

## Attachments

Table 1 – Data Qualifier Table

Table 2 – Field Duplicate Comparison

**Table 1**  
**Data Qualifier Table**  
**BREC Sebree Green Surface Impoundment - June 2023 Sampling Event**  
**Webster County, Kentucky**

Analytical Method	Analyte(s)	Sample Identification	Laboratory Number	Data Validation Qualifier	Reason(s) for Qualification
4500-H+ B-2000	pH	MW11	3061148-01	J	Holding time exceedance
		MW12	3061148-02		
		MW13	3061148-03		
		MW14	3061148-04		
		DUPLICATE	3061148-05		
		FIELD BLANK	3061148-06		

**Notes:**

J = Qualified as estimated during data review

MW = Monitoring Well



**Table 2**  
**Field Duplicate Comparison**  
**BREC Sebree Green Surface Impoundment - June 2023 Sampling Event**  
**Webster County, Kentucky**

Sample ID:	MW14	DUPLICATE		
Lab ID:	3061148-04	3061148-05	Units	Meets QC
Date Sampled:	6/25/2023	6/25/2023		
Boron	0.1 U	0.15	mg/L	Yes
Calcium	0.4 U	189	mg/L	Dilution
Total Dissolved Solids	992	896	mg/L	Yes
Chloride	107	101	mg/L	Yes
Fluoride	0.3	0.3	mg/L	Yes
Sulfate	184	173	mg/L	Yes
pH	7.24	7.36	Std. Units	Yes

**Notes:**

Dilution - differing dilutions, no conclusions can be made

ID - Identification

U = nondetect

mg/L - milligram per liter

MW = Monitoring Well

QC = Quality Assurance/Quality Control

# Memorandum



Date: December 20, 2023

To: Christopher Hoglund

From: Jacque Reilly

Re: Quality Assurance/Quality Control (QA/QC) Review of Analytical Data  
Big Rivers Electric Company (BREC) - Sebree Station, Surface Impoundment Site,  
Webster County, Kentucky  
Project No. 159154

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Groundwater samples were collected at the BREC Sebree Green Surface Impoundment Site in Webster County, Kentucky on November 6, 2023 through November 8, 2023. The samples were analyzed by Pace Analytical Services of Madisonville, Kentucky (Pace Madisonville) for one or more of the following parameters:

Parameter(s)	Analytical Method	Laboratory
Metals arsenic, boron, and calcium	SW-846 6010B/ SW-846 6020A	Pace - Madisonville
pH	4500-H+ B-2011	
Total Dissolved Solids (TDS)	2540 C-2015	
Anions chloride, fluoride, and sulfate	SW-846 9056	

The quality assurance (QA)/quality control (QC) results in association with the groundwater samples collected were examined for any method-specific requirements. Data qualifiers, when appropriate, were added to the data in accordance with recommendations 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 any data qualifiers added during the course of this review are summarized in Table 1.

1. Chain-of-Custody (COC) – The relinquished and received signatures, times, and dates were present on the COCs for all samples.
2. Requested Analyses Completed – All analyses were completed as requested.
3. Holding Times – The pH for all the samples in the sample delivery group (SDG) 3111623 was analyzed outside the 24-hour holding time, and therefore, these results were qualified as estimated (J). All the other samples/analyses were completed within their recommended holding time.
4. Sample Preservation – The preservation temperature(s) noted by Pace-Madisonville were within the preservation temperature range of 4 degrees Celsius (°C) +/- 2°C. No qualifiers were necessary.
5. Field Blank – One field blank was collected in the field to assess potential cross-contamination during the sample activities and/or transport. The following detections of target analytes were noted in the field blank:

# Memorandum *(continued)*



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- SDG 3111623: A detection of TDS and a trace detection (J-flagged) of sulfate were noted in the field blank sample. All associated detections were five times greater than the field blank detections, and therefore, no qualifiers were necessary.
6. Method Blanks – Method blanks were reviewed to assess possible cross-contamination or carryover in sample preparation or analysis. No target analytes were detected in the method blanks.
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 the 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. All LCS results were within QC limits, except for:
- SDG 3111623: The LCS REC for pH in batch BCK0601 exceeded the QC limits. All associated pH results were already qualified for holding time exceedances (see section 3) thus, these results were qualified as estimated (J) and no bias indicators were added.
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 RPD. They are also compared against the unspiked portion of the sample for REC of the spike. Note that only site-specific MS/MSD results were evaluated during this QA/QC review. All site-specific MS/MSD results were within their respective QC limits except for the following:

SDG 3111623; MS/MSD performed on MW-11 (3111623-01): The MS REC for calcium recovered above the QC Limit. Upon further review, the laboratory spike amount for calcium was less than  $\frac{1}{4}$  the concentration of the spiked sample. Additionally, this analysis for the spiked parent sample was performed at a dilution. As such, no conclusion could be made regarding this MS/MSD and no qualifiers were added. Note: The corresponding post spike was also performed on this same sample and also did not meet the  $\frac{1}{4}$  requirement. Accuracy was assessed by review of the LCS, which was within its QC limits.

On this same spiked sample, it is noted that boron was spiked, but no MS/MSD results were provided.

# Memorandum *(continued)*



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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 the site-specific laboratory duplicates were within QC limits and no qualifiers were necessary.
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  $\pm$  the lower detection limit for water samples.

The following field duplicate pair was included in this review.

- MW-14 // DUPLICATE (3111623-04 // 3111623-05): All results were adequately replicated.
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. Reporting limits (RLs) were adjusted accordingly, and no data qualifiers were added based on these dilutions.
  12. Conclusion – The data were reviewed for achievement of any method-specified QA/QC criteria. The data are valid for use, as qualified, in reporting the results of this groundwater monitoring event.

## Attachments

Table 1 – Data Qualifier Table

Table 2 – Field Duplicate Comparison

**Table 1**  
**Data Qualifier Table**  
**BREC Sebree Green Surface Impoundment - November 2023 Sampling Event**  
**Webster County, Kentucky**

SDG	Sample Identification	Laboratory Number	Analytical Method	Analyte(s)	Data Validation Qualifier	Reason(s) for Qualification
3111623	MW11	3111623-01	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits
	MW12	3111623-02	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits
	MW13	3111623-03	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits
	MW14	3111623-04	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits
	DUPLICATE	3111623-05	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits
	FIELD BLANK	3111623-06	4500-H+ B-2000	pH	J	Holding time exceedance LCS REC > QC Limits

**Notes:**

- J = Qualified as estimated during data review
- LCS = Laboratory Control Sample
- MW = Monitoring Well
- REC = Percent Recovery
- SDG = Sample Delivery Group

**Table 2**  
**Field Duplicate Comparison**  
**BREC Sebree Green Surface Impoundment - November 2023 Sampling Event**  
**Webster County, Kentucky**

Sample ID: Lab ID: Date Sampled:	MW14 3111623-04 11/6/2023	DUPLICATE 3111623-05 11/6/2023	Units	Meets QC
Boron	0.13	0.13	mg/L	Yes
Calcium	155	158	mg/L	Yes
pH	7.57 J	7.42 J	std. unit	Yes
Total Dissolved Solids (TDS)	940	988	mg/L	Yes
Chloride	104	105	mg/L	Yes
Fluoride	0.3	0.3	mg/L	Yes
Sulfate	176	178	mg/L	Yes

**Notes:**

- ID - Identification
- J - Estimated
- mg/L - milligram per Liter
- MW = Monitoring Well
- QC = Quality Assurance/Quality Control
- std. unit = standard unit

## APPENDIX J - GREEN LANDFILL STATISTICAL EVALUATIONS

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November 3, 2023

Mr. Mark Bertram  
Big Rivers Electric Corporation  
9000 Highway 2096  
Robards, KY 42452

Re: Statistical Evaluation of June 2023 Assessment Monitoring Groundwater Data  
Sebree Generating Station Green Landfill in Robards, Kentucky  
Agency Interest ID #: 4196

Dear Mr. Bertram:

This letter presents the results of the statistical evaluation of analytical data from the June 2023 assessment monitoring event performed at the Sebree Generating Station's Green Landfill in Webster County, Robards, 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 June 2023 sampling results to calculated groundwater protection standards (GWPSs). The GWPSs for the groundwater monitoring network were reviewed and updated as part of the statistical evaluation completed for the June 2023 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 June 2023 data to the updated GWPSs is presented on Table 2. The statistical evaluation presented herein was performed in accordance with the *Groundwater Monitoring System and Statistical Methods* document prepared by Associated Engineers, Inc. and dated June 28, 2016.

In June 2023, the Green 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 the CCR unit 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 June 2023 assessment monitoring event for inclusion in the Sebree Generating Station Operating Record.

### **Statistical Evaluation of Sebree Green Landfill Compliance Monitoring Well Network Evaluation**

An interwell prediction limit evaluation was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in June 2023 compliance (downgradient) monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 to calculated prediction limits (i.e., background limits) that were established using data collected from March of 2016 through June

Mr. Mark Bertram  
Big Rivers Electric Corporation  
November 3, 2023  
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of 2023 from upgradient monitoring well MW-1. Certain Appendix III and Appendix IV parameters were detected in Jun 2023 at concentrations with statistically significant increases (SSI) above the calculated background limits (equivalent to the MW-1 prediction limits), and a summary of the statistical evaluation is included in Attachment 1. This included the following well/constituent pairs for downgradient compliance monitoring wells with SSIs above calculated background limits:

Appendix III Parameters:

- Calcium (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Chloride (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Sulfate (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Total Dissolved Solids (TDS) (MW-2, MW-3A, MW-4, MW-5, and MW-6)

Appendix IV Parameters:

- Arsenic (MW-2)
- Barium (MW-2)
- Lithium (MW-3A, MW-4, MW-5, and MW-6)
- Mercury (MW-4)
- Molybdenum (MW-2)
- Selenium (MW-4)

Results of SSIs above background were generally consistent with the 2016 through December 2022 statistical results. The Appendix III SSIs for calcium, chloride, sulfate, and TDS continue to occur at downgradient compliance monitoring wells. All above-noted Appendix IV SSIs for this event are consistent with the previous December 2022 event.

The Appendix IV constituents with SSIs (arsenic, barium, lithium, mercury, molybdenum, and selenium) 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 arsenic, barium, lithium, mercury, molybdenum, and selenium at downgradient compliance monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 resulted in the following well/constituent pairs with SSLs above the GWPS:

- Arsenic (MW-2)

Mr. Mark Bertram  
Big Rivers Electric Corporation  
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- Lithium (MW-3A, MW-4, MW-5, and MW-6)

The LCLs for the remaining well/constituent pairs for arsenic, barium, lithium, mercury, molybdenum, and selenium 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 consistent with the December 2022 results.

Given that certain Appendix III and IV constituents were observed at the Green Landfill groundwater monitoring network at concentrations above their respective calculated background limit and 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 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 December 2022 Analytical Results

Attachment 1 – Sanitas™ Statistical Outputs

cc: Greg Dick, BREC Sebree Station

## **TABLES**

**TABLE 1**  
**Calculated Background and Groundwater Protection Standards for Groundwater**  
**Sebree Generating Station Green Landfill in Robards, Kentucky**

Detection Constituents (Appendix III)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Boron	mg/L	2.216	--	--	--
Calcium	mg/L	36.08	--	--	--
Chloride	mg/L	13.9	--	--	--
Fluoride	mg/L	0.888	4	--	--
pH (field)	SU	4.86 - 7.63	--	--	--
Sulfate	mg/L	48.92	--	--	--
TDS	mg/L	692.6	--	--	--
Assessment Constituents (Appendix IV)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Antimony	mg/L	0.00297	0.006	--	0.006
Arsenic	mg/L	0.003712	0.01	--	0.01
Barium	mg/L	0.1013	2	--	2
Beryllium	mg/L	0.000533	0.004	--	0.004
Cadmium	mg/L	0.000299	0.005	--	0.005
Chromium	mg/L	0.00354	0.1	--	0.1
Cobalt	mg/L	0.002	--	0.006	0.006
Fluoride	mg/L	0.888	4	--	4
Lead	mg/L	0.000279	--	0.015	0.015
Lithium	mg/L	0.0396	--	0.04	0.04
Mercury	mg/L	0.0002	0.002	--	0.002
Molybdenum	mg/L	0.002	--	0.1	0.1
Combined Radium 226 and 228**	pCi/L	2.48	5	--	5
Selenium	mg/L	0.00105	0.05	--	0.05
Thallium	mg/L	0.000498	0.002	--	0.002

**Notes:**

\*Groundwater Protection Standards were developed in accordance with §257.95(h). Background concentrations were determined utilizing interwell prediction limits (see Attachment 1). Upgradient Monitoring Well MW-1 was used to calculate background concentrations. This included background data ranging from March 2016 through June 2023

\*\*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.

CFR - Code of Federal Regulations

mg/L - milligrams per Liter

pCi/L - picocuries per Liter

MCL - Maximum Contaminant Level

SU - standard units

TDS - Total Dissolved Solids

**TABLE 2**  
**Green Landfill - June 2023 Analytical Summary**  
**Sebree Generating Station**

APPENDIX III CONSTITUENTS	2023 Calculated Background	2023 GWPS	Units	MW-1	MW-2	MW-3A	MW-4	MW-5	MW-6	
				Background Well	Downgradient Compliance Well					
				Detection Monitoring						
Boron	2.216	--	mg/L	1.93	0.10 U	0.30	1.20 D1	0.24	0.19	
Calcium	36.08	--	mg/L	28.6 D1, M1, M2	<b>192 D1</b>	<b>531 D1</b>	<b>725 D1</b>	<b>485 D1</b>	<b>408 D1</b>	
Chloride	13.9	--	mg/L	5.7	<b>218 D</b>	<b>1820 D</b>	<b>1130 D</b>	<b>1020 D</b>	<b>144 D</b>	
Fluoride	0.888	4	mg/L	0.5	0.2	0.5	0.2	0.3	0.5	
pH (Field Measurement)	4.86 - 7.63	--	s.u.	7.15	6.33	6.94	6.52	6.47	6.60	
Sulfate	48.92	--	mg/L	31	<b>156</b>	<b>1140 D,M2</b>	<b>1650 D</b>	<b>1900 D</b>	<b>2360 D</b>	
Total Dissolved Solids	692.6	--	mg/L	520	<b>1610</b>	<b>5090</b>	<b>4660 H2, J</b>	<b>4220 H2, J</b>	<b>4760 H2, J</b>	
<b>APPENDIX IV CONSTITUENTS</b>										
Antimony	0.00297	0.006	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Arsenic	0.003712	0.01	mg/L	0.0005 J	<b>0.0323</b>	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Barium	0.1013	2	mg/L	0.071	<b>0.340</b>	0.035	0.023	0.012	0.011	
Beryllium	0.000533	0.004	mg/L	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	
Cadmium	0.000299	0.005	mg/L	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Chromium	0.00354	0.1	mg/L	0.0006 U	0.0006 U	0.0006 U	0.0018 J	0.0006 U	0.0008 J	
Cobalt	0.002	0.006	mg/L	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	
Fluoride	0.888	4	mg/L	0.5	0.2	0.5	0.2	0.3	0.5	
Lead	0.000279	0.015	mg/L	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Lithium	0.0396	0.04	mg/L	0.03	0.006 J	<b>0.64</b>	<b>1.2 D1</b>	<b>0.33</b>	<b>0.04</b>	
Mercury	0.0002	0.002	mg/L	0.0002 U	0.0002 U	0.0002 U	<b>0.0004 J</b>	0.0002 U	0.0002 U	
Molybdenum	0.002	0.1	mg/L	0.002 U	<b>0.005 J</b>	0.002 U	0.002 U	0.002 U	0.002 J	
Radium 226	2.48	5	pCi/L	0.805 J	1.50 J	1.43 J	2.09 J	1.69 J/J-	1.40 J	
Radium 228										
Selenium	0.00105	0.05	mg/L	0.001 U	0.001 U	0.001 U	<b>0.003</b>	0.001 U	0.001 U	
Thallium	0.000498	0.002	mg/L	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 J	0.0001 U	

GWPS = Groundwater Protection Standard

**Bold** - Analyte detected above calculated background concentration.

Parameter was detected in well located downgradient of the CCR Landfill at a statistically significant level above its GWPS

mg/L = milligrams per liter

pCi/L = picoCuries per Liter

s.u. = standard units

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is qualified as estimated.

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 analysis

H2 = Initial analysis within holding time. Reanalysis was past holding time.

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

**ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS**



# Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 8:13 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-2	0.00297	n/a	6/24/2023	0.001ND	No	19	57.89	n/a	0.04565	NP Inter (NDs)
Antimony (mg/L)	MW-3A	0.00297	n/a	6/23/2023	0.001ND	No	19	57.89	n/a	0.04565	NP Inter (NDs)
Antimony (mg/L)	MW-4	0.00297	n/a	6/22/2023	0.001ND	No	19	57.89	n/a	0.04565	NP Inter (NDs)
Antimony (mg/L)	MW-5	0.00297	n/a	6/22/2023	0.001ND	No	19	57.89	n/a	0.04565	NP Inter (NDs)
Antimony (mg/L)	MW-6	0.00297	n/a	6/22/2023	0.001ND	No	19	57.89	n/a	0.04565	NP Inter (NDs)
<b>Arsenic (mg/L)</b>	<b>MW-2</b>	<b>0.003712</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>0.0323</b>	<b>Yes</b>	<b>20</b>	<b>10</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
Arsenic (mg/L)	MW-3A	0.003712	n/a	6/23/2023	0.0002ND	No	20	10	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-4	0.003712	n/a	6/22/2023	0.0002ND	No	20	10	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-5	0.003712	n/a	6/22/2023	0.0002ND	No	20	10	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-6	0.003712	n/a	6/22/2023	0.0002ND	No	20	10	ln(x)	0.01	Param Inter
<b>Barium (mg/L)</b>	<b>MW-2</b>	<b>0.1013</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>0.34</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
Barium (mg/L)	MW-3A	0.1013	n/a	6/23/2023	0.035	No	20	0	No	0.01	Param Inter
Barium (mg/L)	MW-4	0.1013	n/a	6/22/2023	0.023	No	20	0	No	0.01	Param Inter
Barium (mg/L)	MW-5	0.1013	n/a	6/22/2023	0.012	No	20	0	No	0.01	Param Inter
Barium (mg/L)	MW-6	0.1013	n/a	6/22/2023	0.011	No	20	0	No	0.01	Param Inter
Beryllium (mg/L)	MW-2	0.000533	n/a	6/24/2023	0.0005ND	No	19	94.74	n/a	0.04565	NP Inter (NDs)
Beryllium (mg/L)	MW-3A	0.000533	n/a	6/23/2023	0.0005ND	No	19	94.74	n/a	0.04565	NP Inter (NDs)
Beryllium (mg/L)	MW-4	0.000533	n/a	6/22/2023	0.0005ND	No	19	94.74	n/a	0.04565	NP Inter (NDs)
Beryllium (mg/L)	MW-5	0.000533	n/a	6/22/2023	0.0005ND	No	19	94.74	n/a	0.04565	NP Inter (NDs)
Beryllium (mg/L)	MW-6	0.000533	n/a	6/22/2023	0.0005ND	No	19	94.74	n/a	0.04565	NP Inter (NDs)
Boron (mg/L)	MW-2	2.216	n/a	6/24/2023	0.05ND	No	21	0	No	0.01	Param Inter
Boron (mg/L)	MW-3A	2.216	n/a	6/23/2023	0.3	No	21	0	No	0.01	Param Inter
Boron (mg/L)	MW-4	2.216	n/a	6/22/2023	1.2	No	21	0	No	0.01	Param Inter
Boron (mg/L)	MW-5	2.216	n/a	6/22/2023	0.24	No	21	0	No	0.01	Param Inter
Boron (mg/L)	MW-6	2.216	n/a	6/22/2023	0.19	No	21	0	No	0.01	Param Inter
Cadmium (mg/L)	MW-2	0.000299	n/a	6/24/2023	0.00005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Cadmium (mg/L)	MW-3A	0.000299	n/a	6/23/2023	0.00005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Cadmium (mg/L)	MW-4	0.000299	n/a	6/22/2023	0.00005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Cadmium (mg/L)	MW-5	0.000299	n/a	6/22/2023	0.00005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Cadmium (mg/L)	MW-6	0.000299	n/a	6/22/2023	0.00005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
<b>Calcium (mg/L)</b>	<b>MW-2</b>	<b>36.08</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>192</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-3A</b>	<b>36.08</b>	<b>n/a</b>	<b>6/23/2023</b>	<b>531</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-4</b>	<b>36.08</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>725</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-5</b>	<b>36.08</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>485</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-6</b>	<b>36.08</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>408</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Chloride (mg/L)</b>	<b>MW-2</b>	<b>13.9</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>218</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-3A</b>	<b>13.9</b>	<b>n/a</b>	<b>6/23/2023</b>	<b>1820</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-4</b>	<b>13.9</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>1130</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-5</b>	<b>13.9</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>1020</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-6</b>	<b>13.9</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>144</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
Chromium (mg/L)	MW-2	0.00354	n/a	6/24/2023	0.0003ND	No	19	73.68	n/a	0.04565	NP Inter (NDs)
Chromium (mg/L)	MW-3A	0.00354	n/a	6/23/2023	0.0003ND	No	19	73.68	n/a	0.04565	NP Inter (NDs)
Chromium (mg/L)	MW-4	0.00354	n/a	6/22/2023	0.0018J	No	19	73.68	n/a	0.04565	NP Inter (NDs)
Chromium (mg/L)	MW-5	0.00354	n/a	6/22/2023	0.0003ND	No	19	73.68	n/a	0.04565	NP Inter (NDs)
Chromium (mg/L)	MW-6	0.00354	n/a	6/22/2023	0.0008J	No	19	73.68	n/a	0.04565	NP Inter (NDs)
Cobalt (mg/L)	MW-2	0.002	n/a	6/24/2023	0.002ND	No	19	42.11	n/a	0.04565	NP Inter (normality)
Cobalt (mg/L)	MW-3A	0.002	n/a	6/23/2023	0.002ND	No	19	42.11	n/a	0.04565	NP Inter (normality)
Cobalt (mg/L)	MW-4	0.002	n/a	6/22/2023	0.002ND	No	19	42.11	n/a	0.04565	NP Inter (normality)
Cobalt (mg/L)	MW-5	0.002	n/a	6/22/2023	0.002ND	No	19	42.11	n/a	0.04565	NP Inter (normality)
Cobalt (mg/L)	MW-6	0.002	n/a	6/22/2023	0.002ND	No	19	42.11	n/a	0.04565	NP Inter (normality)

## Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 8:13 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Fluoride (mg/L)	MW-2	0.888	n/a	6/24/2023	0.2	No	21	0	n/a	0.04182	NP Inter (normality)
Fluoride (mg/L)	MW-3A	0.888	n/a	6/23/2023	0.5	No	21	0	n/a	0.04182	NP Inter (normality)
Fluoride (mg/L)	MW-4	0.888	n/a	6/22/2023	0.2	No	21	0	n/a	0.04182	NP Inter (normality)
Fluoride (mg/L)	MW-5	0.888	n/a	6/22/2023	0.3	No	21	0	n/a	0.04182	NP Inter (normality)
Fluoride (mg/L)	MW-6	0.888	n/a	6/22/2023	0.5	No	21	0	n/a	0.04182	NP Inter (normality)
Lead (mg/L)	MW-2	0.000279	n/a	6/24/2023	0.00025ND	No	19	68.42	n/a	0.04565	NP Inter (NDs)
Lead (mg/L)	MW-3A	0.000279	n/a	6/23/2023	0.00025ND	No	19	68.42	n/a	0.04565	NP Inter (NDs)
Lead (mg/L)	MW-4	0.000279	n/a	6/22/2023	0.00025ND	No	19	68.42	n/a	0.04565	NP Inter (NDs)
Lead (mg/L)	MW-5	0.000279	n/a	6/22/2023	0.00025ND	No	19	68.42	n/a	0.04565	NP Inter (NDs)
Lead (mg/L)	MW-6	0.000279	n/a	6/22/2023	0.00025ND	No	19	68.42	n/a	0.04565	NP Inter (NDs)
Lithium (mg/L)	MW-2	0.0396	n/a	6/24/2023	0.006J	No	20	10	n/a	0.04365	NP Inter (normality)
<b>Lithium (mg/L)</b>	<b>MW-3A</b>	<b>0.0396</b>	<b>n/a</b>	<b>6/23/2023</b>	<b>0.64</b>	<b>Yes</b>	<b>20</b>	<b>10</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-4</b>	<b>0.0396</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>1.2</b>	<b>Yes</b>	<b>20</b>	<b>10</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-5</b>	<b>0.0396</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>0.33</b>	<b>Yes</b>	<b>20</b>	<b>10</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-6</b>	<b>0.0396</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>10</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (normality)</b>
Mercury (ug/L)	MW-2	0.2	n/a	6/24/2023	0.1ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Mercury (ug/L)	MW-3A	0.2	n/a	6/23/2023	0.1ND	No	20	95	n/a	0.04365	NP Inter (NDs)
<b>Mercury (ug/L)</b>	<b>MW-4</b>	<b>0.2</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>0.4</b>	<b>Yes</b>	<b>20</b>	<b>95</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (NDs)</b>
Mercury (ug/L)	MW-5	0.2	n/a	6/22/2023	0.1ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	6/22/2023	0.1ND	No	20	95	n/a	0.04365	NP Inter (NDs)
<b>Molybdenum (mg/L)</b>	<b>MW-2</b>	<b>0.002</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>0.005</b>	<b>Yes</b>	<b>19</b>	<b>47.37</b>	<b>n/a</b>	<b>0.04565</b>	<b>NP Inter (normality)</b>
Molybdenum (mg/L)	MW-3A	0.002	n/a	6/23/2023	0.001ND	No	19	47.37	n/a	0.04565	NP Inter (normality)
Molybdenum (mg/L)	MW-4	0.002	n/a	6/22/2023	0.001ND	No	19	47.37	n/a	0.04565	NP Inter (normality)
Molybdenum (mg/L)	MW-5	0.002	n/a	6/22/2023	0.001ND	No	19	47.37	n/a	0.04565	NP Inter (normality)
Molybdenum (mg/L)	MW-6	0.002	n/a	6/22/2023	0.002J	No	19	47.37	n/a	0.04565	NP Inter (normality)
pH [Field] (SU)	MW-2	7.63	4.86	6/24/2023	6.33	No	21	0	n/a	0.08363	NP Inter (normality)
pH [Field] (SU)	MW-3A	7.63	4.86	6/23/2023	6.94	No	21	0	n/a	0.08363	NP Inter (normality)
pH [Field] (SU)	MW-4	7.63	4.86	6/22/2023	6.52	No	21	0	n/a	0.08363	NP Inter (normality)
pH [Field] (SU)	MW-5	7.63	4.86	6/22/2023	6.47	No	21	0	n/a	0.08363	NP Inter (normality)
pH [Field] (SU)	MW-6	7.63	4.86	6/22/2023	6.6	No	21	0	n/a	0.08363	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-2	2.48	n/a	6/24/2023	1.5	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-3A	2.48	n/a	6/23/2023	1.43	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-4	2.48	n/a	6/22/2023	2.09	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	2.48	n/a	6/22/2023	1.69	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-6	2.48	n/a	6/22/2023	1.4	No	19	0	sqrt(x)	0.01	Param Inter
Selenium (mg/L)	MW-2	0.00105	n/a	6/24/2023	0.0005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Selenium (mg/L)	MW-3A	0.00105	n/a	6/23/2023	0.0005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
<b>Selenium (mg/L)</b>	<b>MW-4</b>	<b>0.00105</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>0.003</b>	<b>Yes</b>	<b>19</b>	<b>89.47</b>	<b>n/a</b>	<b>0.04565</b>	<b>NP Inter (NDs)</b>
Selenium (mg/L)	MW-5	0.00105	n/a	6/22/2023	0.0005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
Selenium (mg/L)	MW-6	0.00105	n/a	6/22/2023	0.0005ND	No	19	89.47	n/a	0.04565	NP Inter (NDs)
<b>Sulfate (mg/L)</b>	<b>MW-2</b>	<b>48.92</b>	<b>n/a</b>	<b>6/24/2023</b>	<b>156</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-3A</b>	<b>48.92</b>	<b>n/a</b>	<b>6/23/2023</b>	<b>1140</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-4</b>	<b>48.92</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>1650</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-5</b>	<b>48.92</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>1900</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-6</b>	<b>48.92</b>	<b>n/a</b>	<b>6/22/2023</b>	<b>2360</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
Thallium (mg/L)	MW-2	0.000498	n/a	6/24/2023	0.00005ND	No	19	63.16	n/a	0.04565	NP Inter (NDs)
Thallium (mg/L)	MW-3A	0.000498	n/a	6/23/2023	0.00005ND	No	19	63.16	n/a	0.04565	NP Inter (NDs)
Thallium (mg/L)	MW-4	0.000498	n/a	6/22/2023	0.00005ND	No	19	63.16	n/a	0.04565	NP Inter (NDs)
Thallium (mg/L)	MW-5	0.000498	n/a	6/22/2023	0.0001J	No	19	63.16	n/a	0.04565	NP Inter (NDs)
Thallium (mg/L)	MW-6	0.000498	n/a	6/22/2023	0.00005ND	No	19	63.16	n/a	0.04565	NP Inter (NDs)

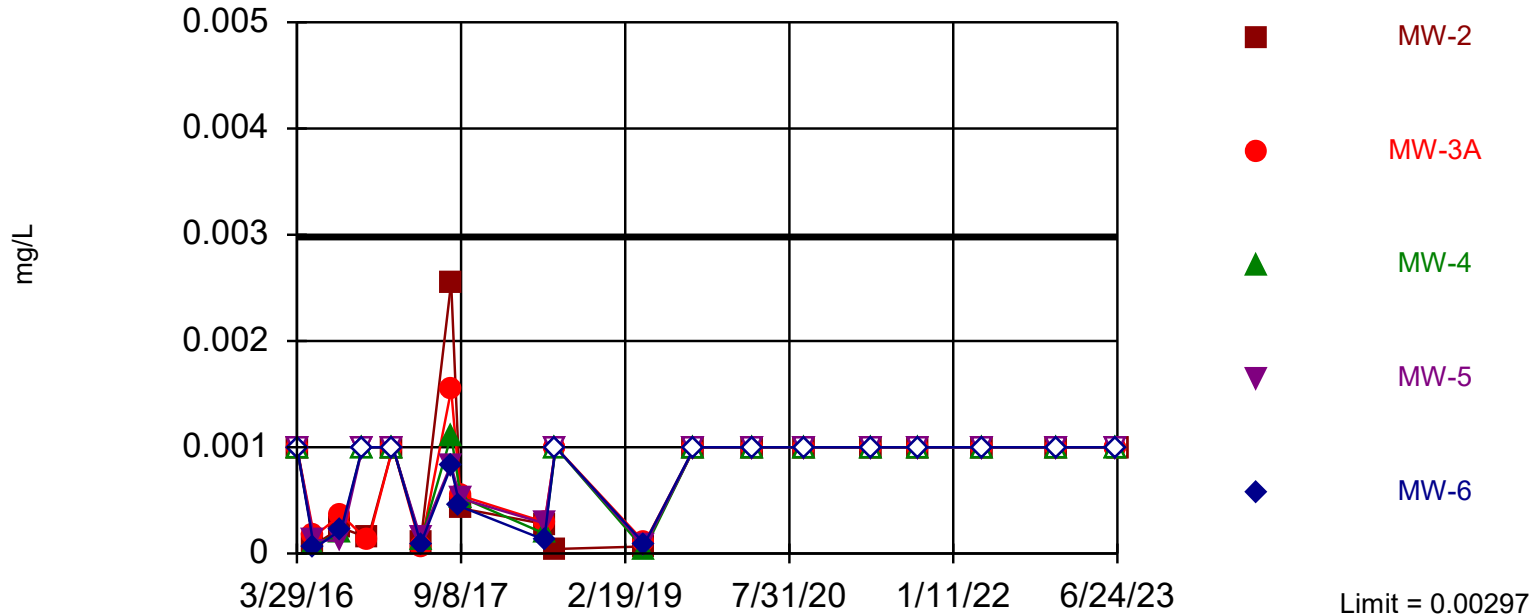
# Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 8:13 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Total Dissolved Solids (mg/L)	MW-2	692.6	n/a	6/24/2023	1610	Yes	21	0	x^4	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-3A	692.6	n/a	6/23/2023	5090	Yes	21	0	x^4	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-4	692.6	n/a	6/22/2023	4660	Yes	21	0	x^4	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-5	692.6	n/a	6/22/2023	4220	Yes	21	0	x^4	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-6	692.6	n/a	6/22/2023	4760	Yes	21	0	x^4	0.01	Param Inter

Within Limit

### Prediction Limit Interwell Non-parametric



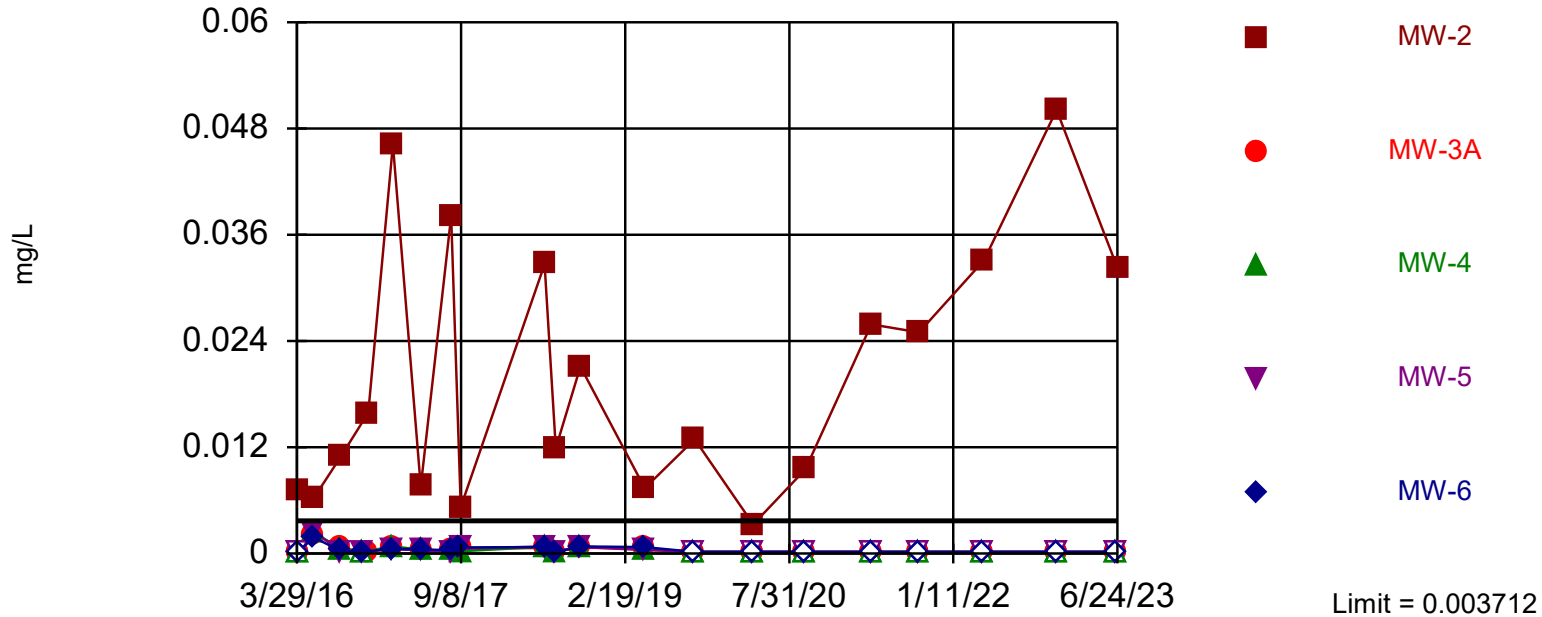
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 19 background values. 57.89% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each compliance well compared to limit. Distribution was found 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 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### Prediction Limit Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-7.333, Std. Dev.=0.6676, n=20, 10% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9137, critical = 0.905. Report alpha = 0.04901. 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.

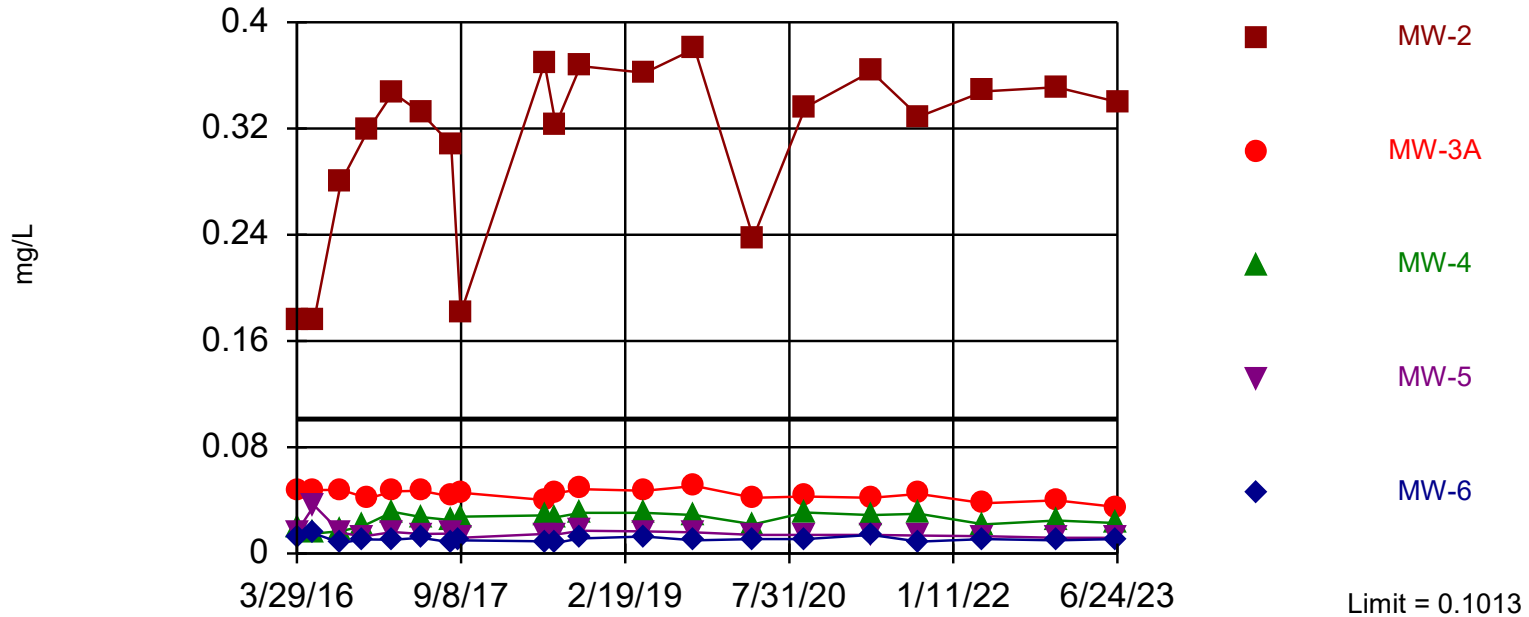
Constituent: Arsenic Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### Prediction Limit

Interwell Parametric



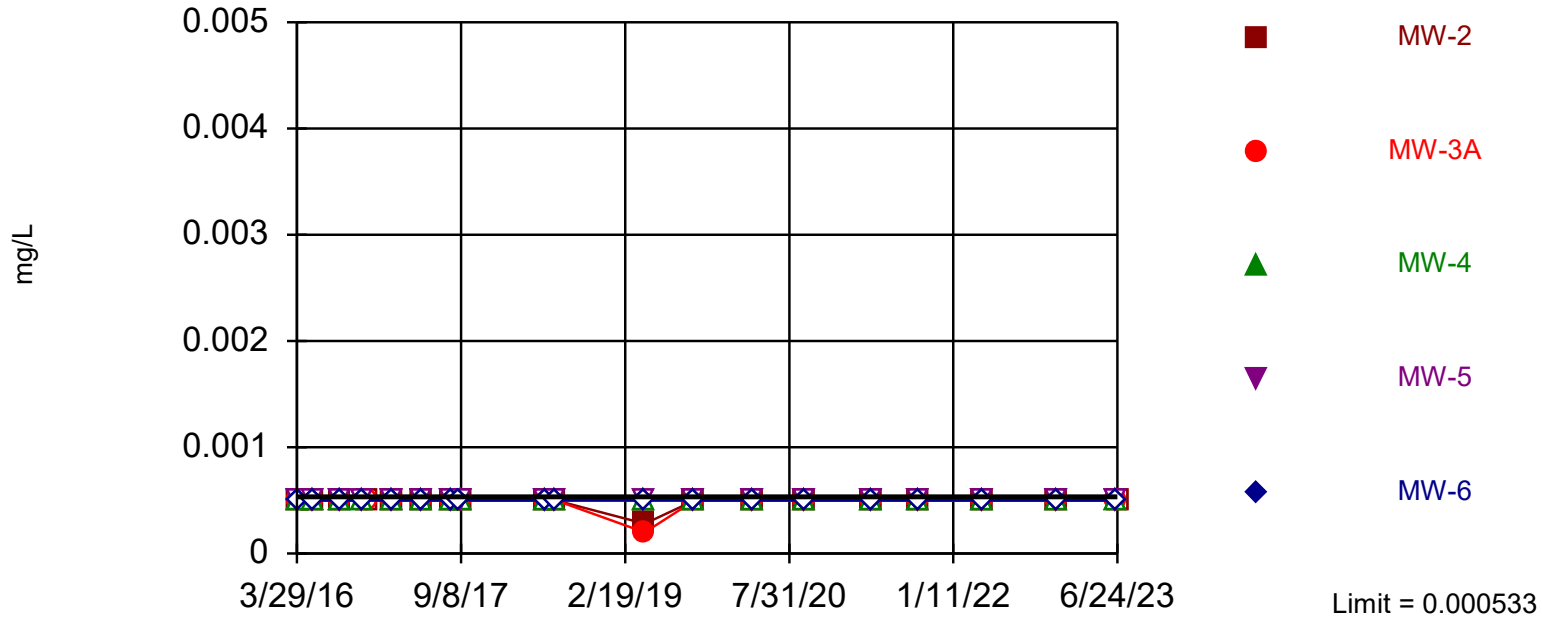
Background Data Summary: Mean=0.08125, Std. Dev.=0.0077, n=20. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9657, critical = 0.905. Report alpha = 0.04901. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 19 background values. 94.74% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. 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 1/8/2024 8:12 AM

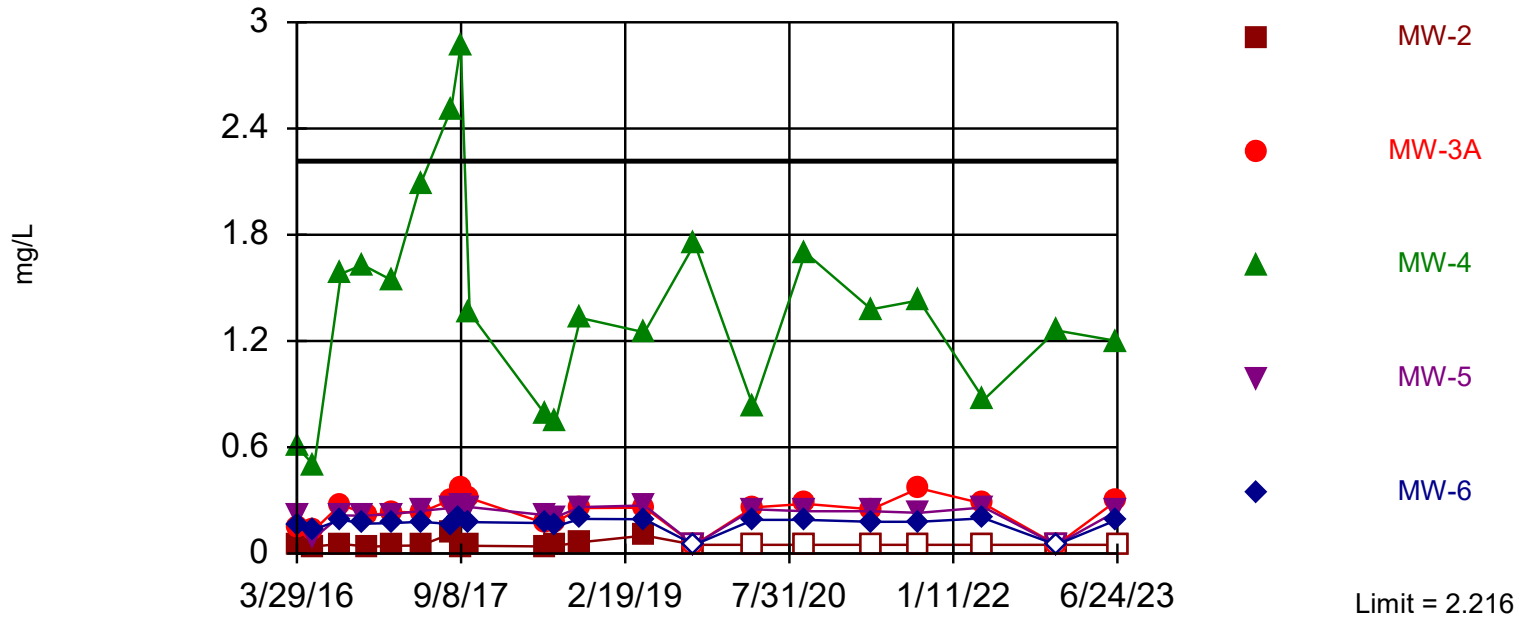
Big Rivers Electric Corp. Data: Green LF All Data



Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.741, Std. Dev.=0.1836, n=21. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9214, critical = 0.908. Report alpha = 0.04901. 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.

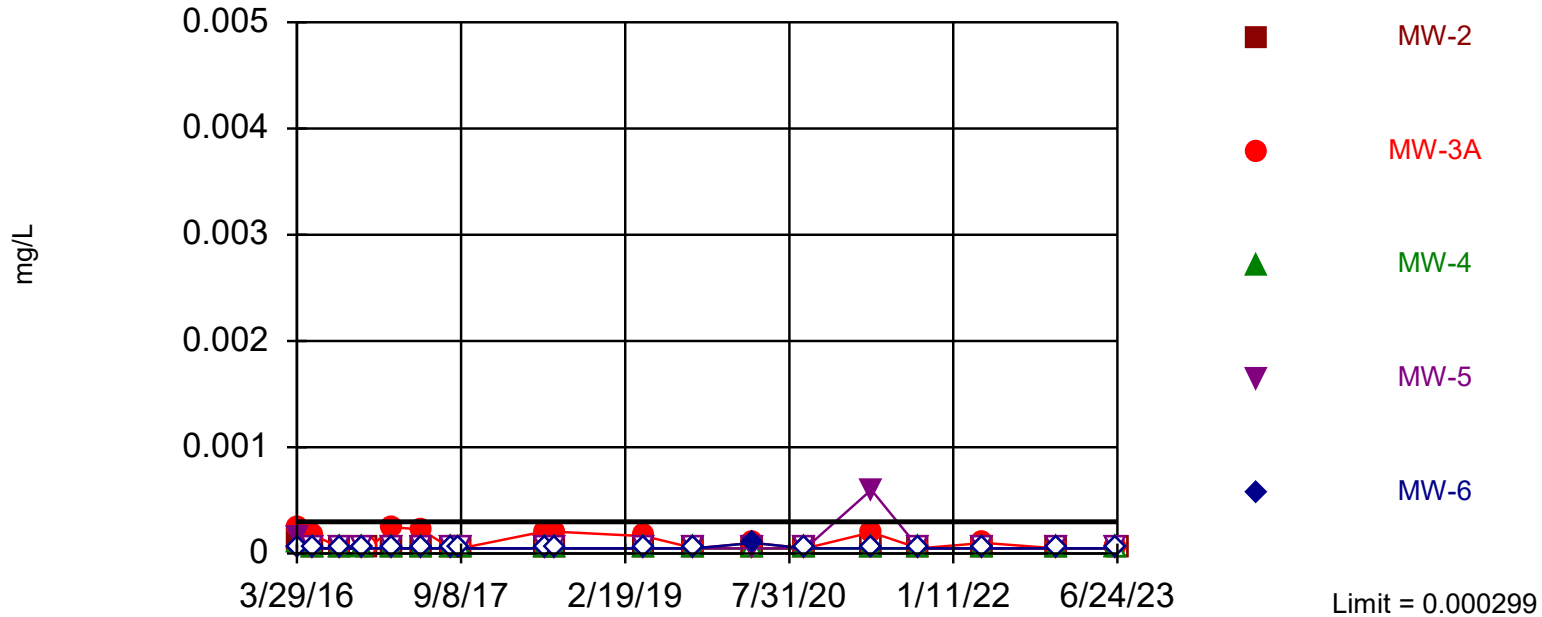
Constituent: Boron Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



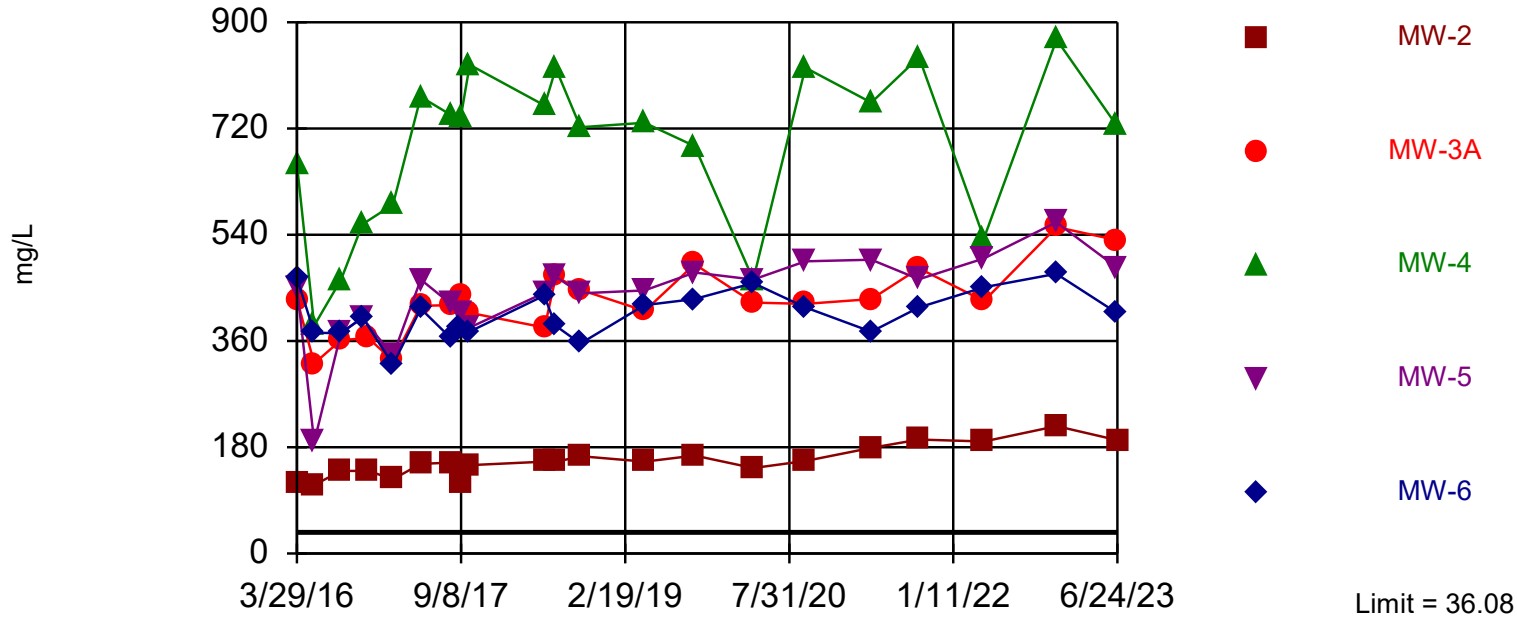
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 19 background values. 89.47% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Cadmium Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit  
Interwell Parametric



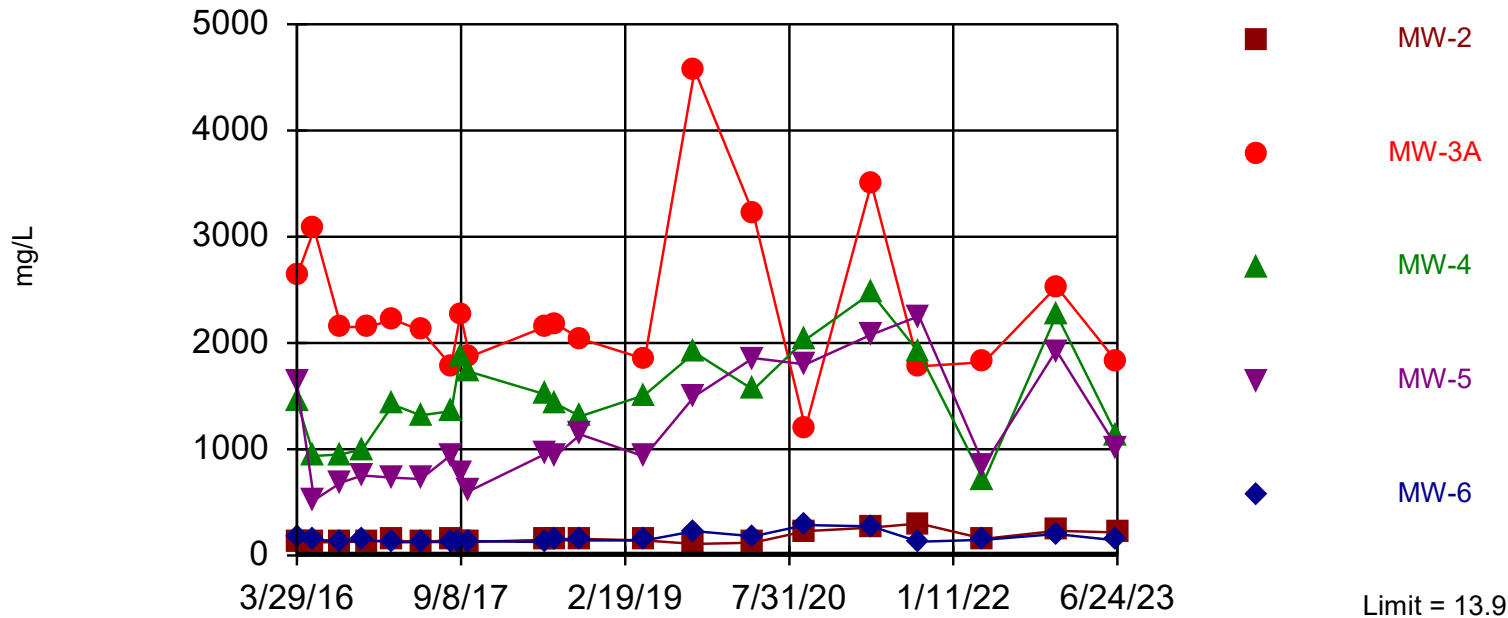
Background Data Summary: Mean=28.88, Std. Dev.=2.783, n=21. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9205, critical = 0.908. Report alpha = 0.04901. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. At least one background value was a statistical outlier but was below the user-set cutoff of 3 times the median. No background outliers were found.

Constituent: Calcium Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

### 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 21 background values. Report alpha = 0.1923. Individual comparison alpha = 0.04182. 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.

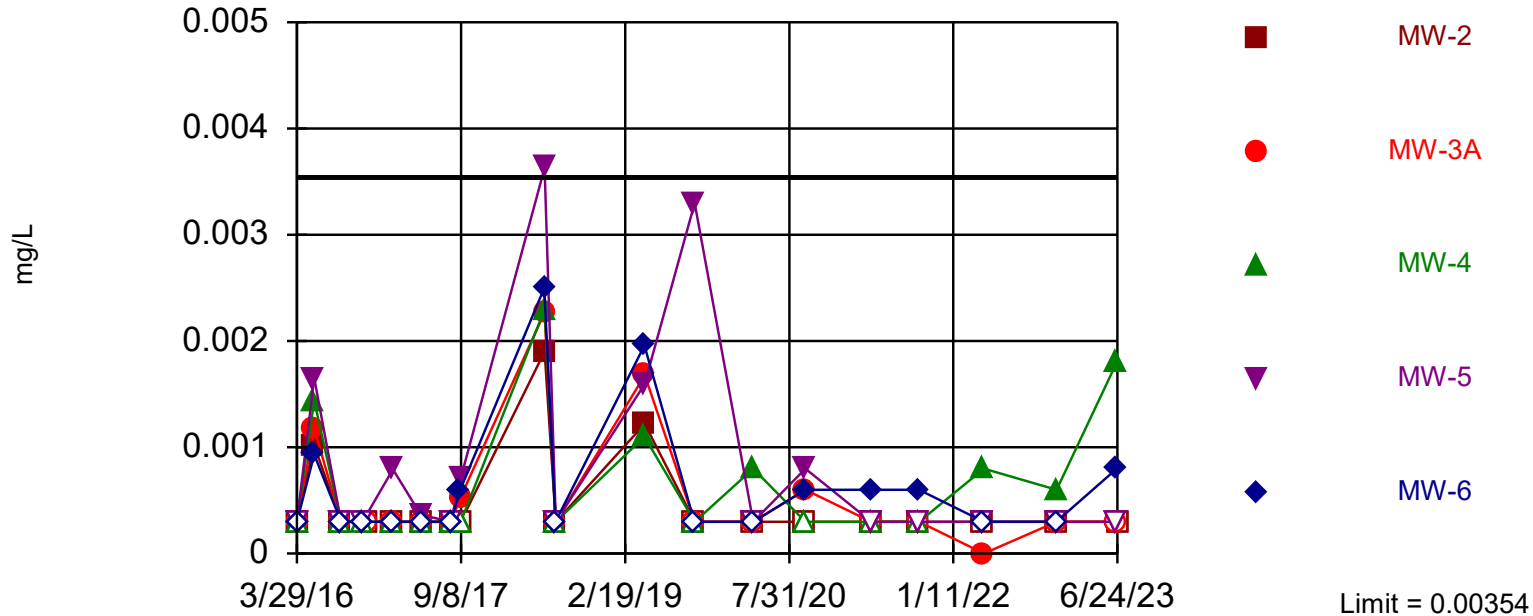
Constituent: Chloride Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 19 background values. 73.68% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. 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.

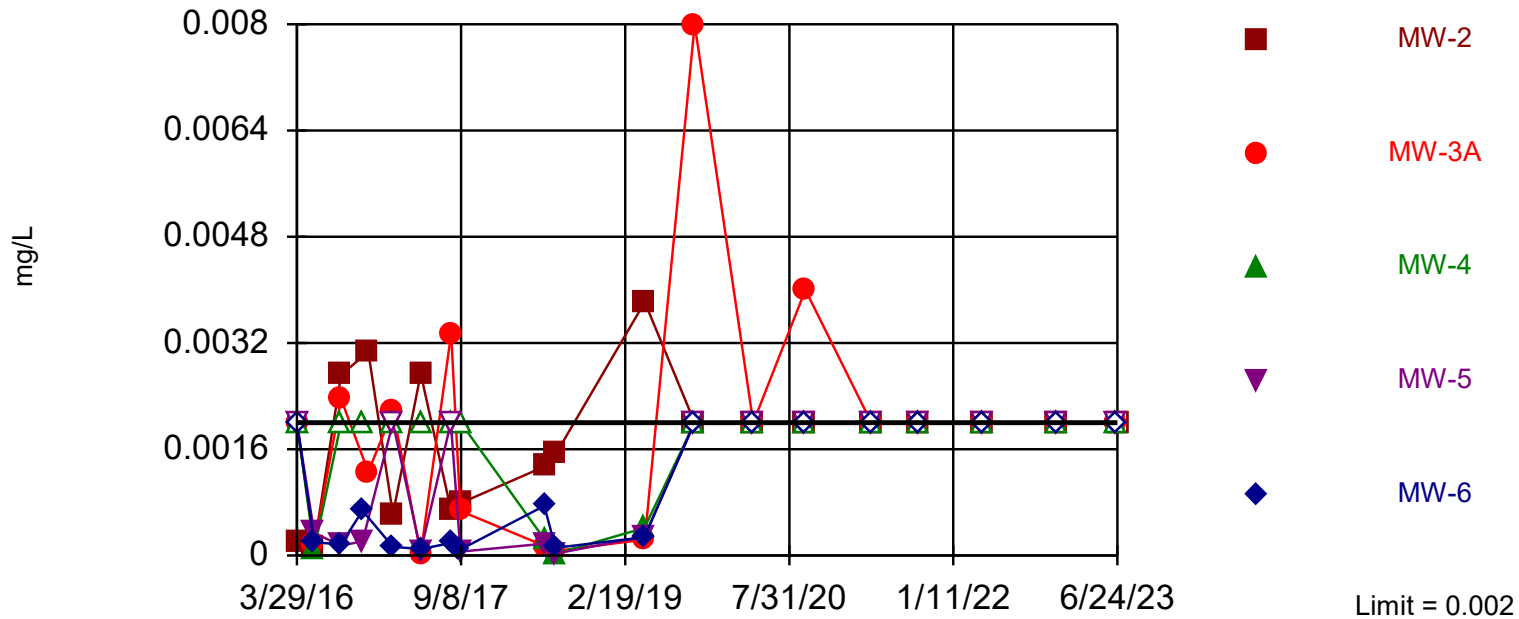
Constituent: Chromium Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



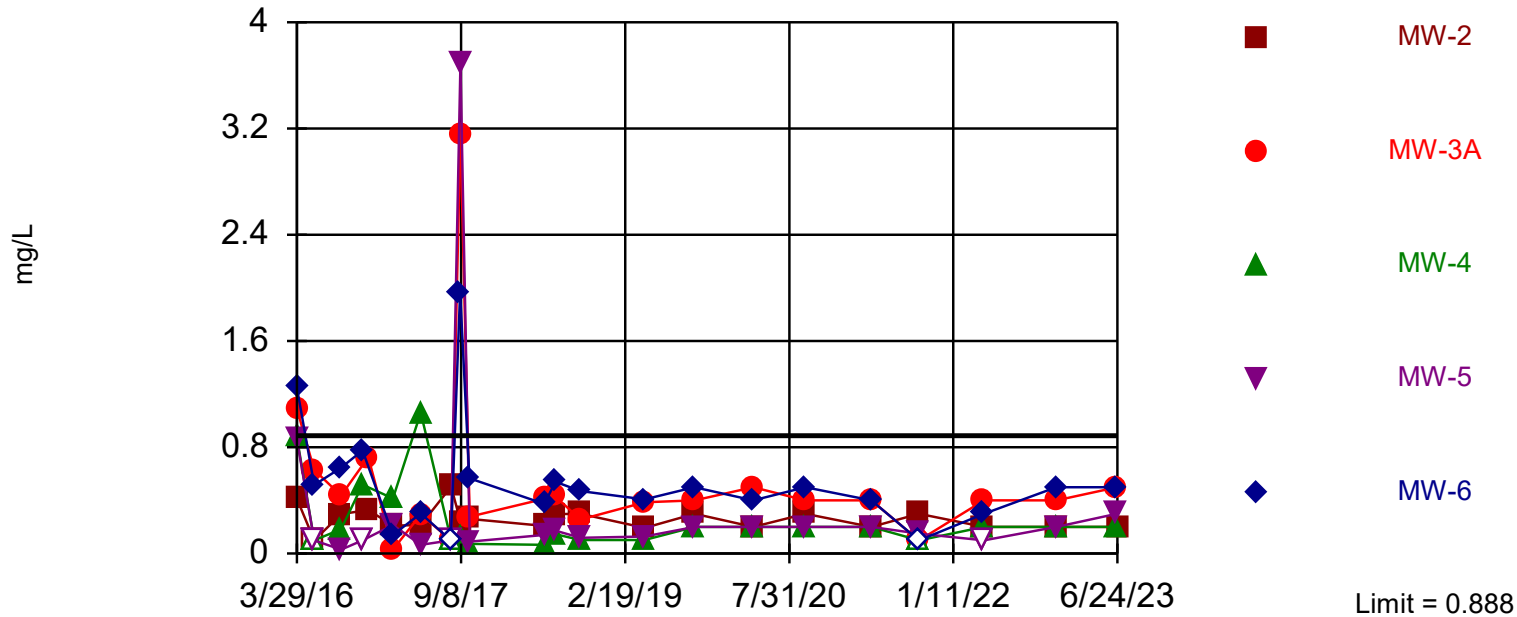
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 19 background values. 42.11% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each 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 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 21 background values. Report alpha = 0.1923. Individual comparison alpha = 0.04182. 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.

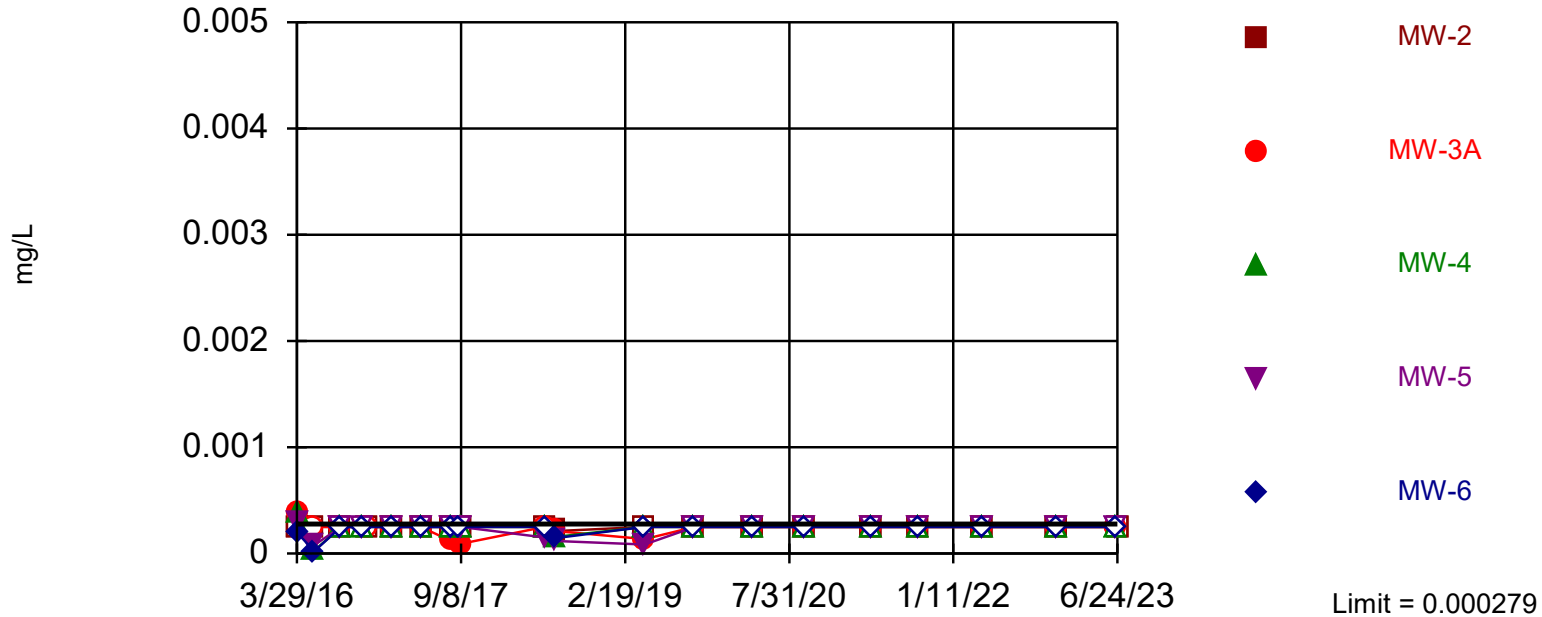
Constituent: Fluoride Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data



Within Limit

### Prediction Limit Interwell Non-parametric

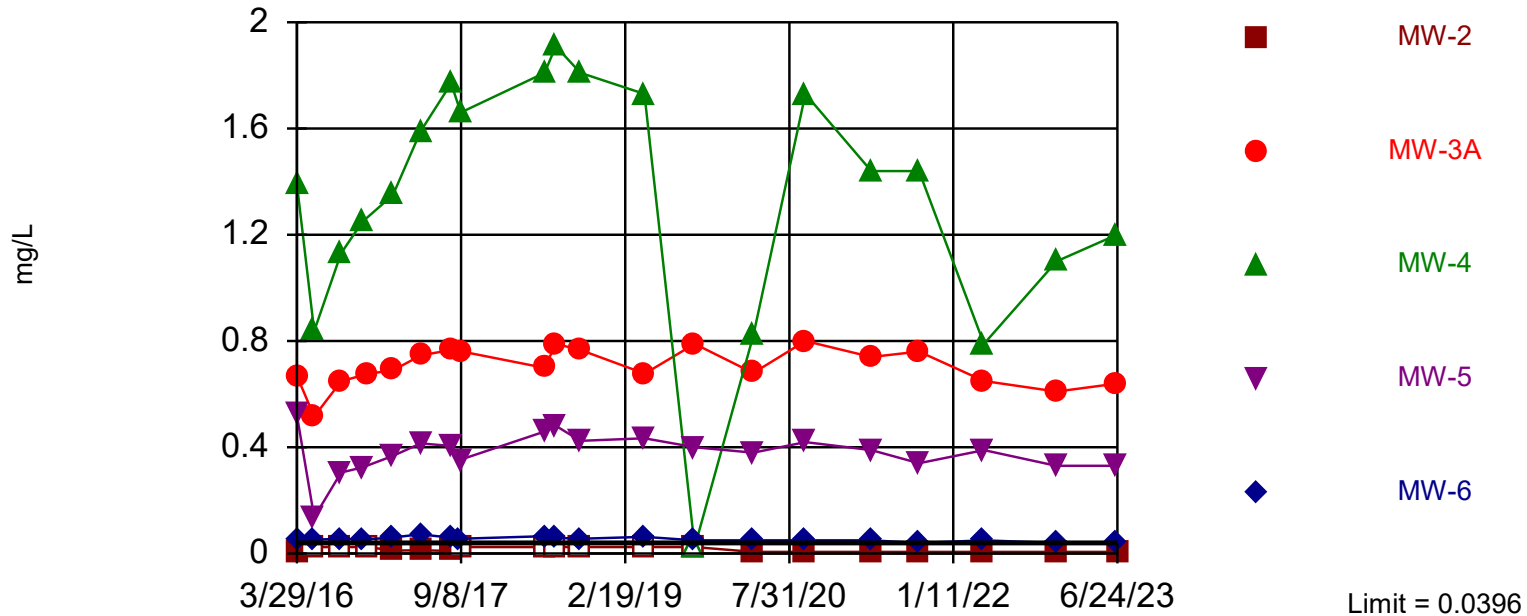


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 19 background values. 68.42% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Lead Analysis Run 1/8/2024 8:12 AM  
Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-3A, MW-4, MW-5, MW-6

### Prediction Limit Interwell Non-parametric

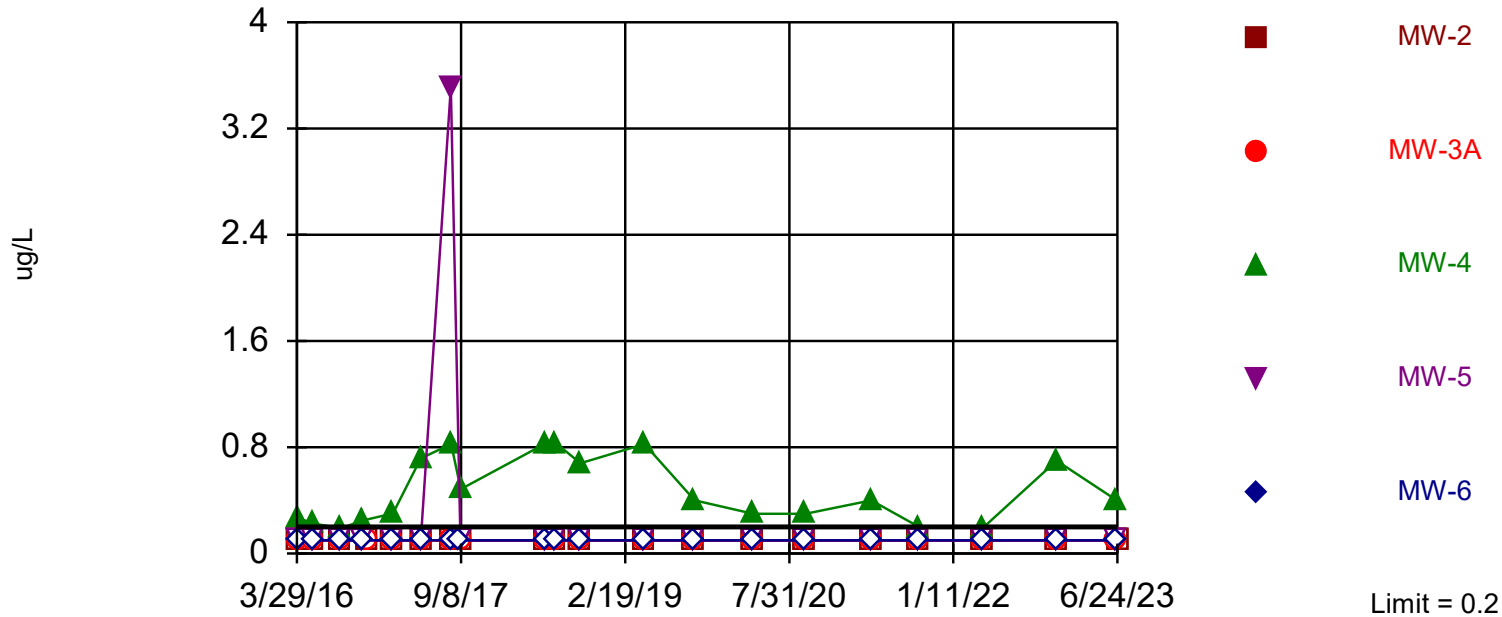


Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 20 background values. 10% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance 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: Lithium Analysis Run 1/8/2024 8:12 AM  
Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-4

### Prediction Limit Interwell Non-parametric

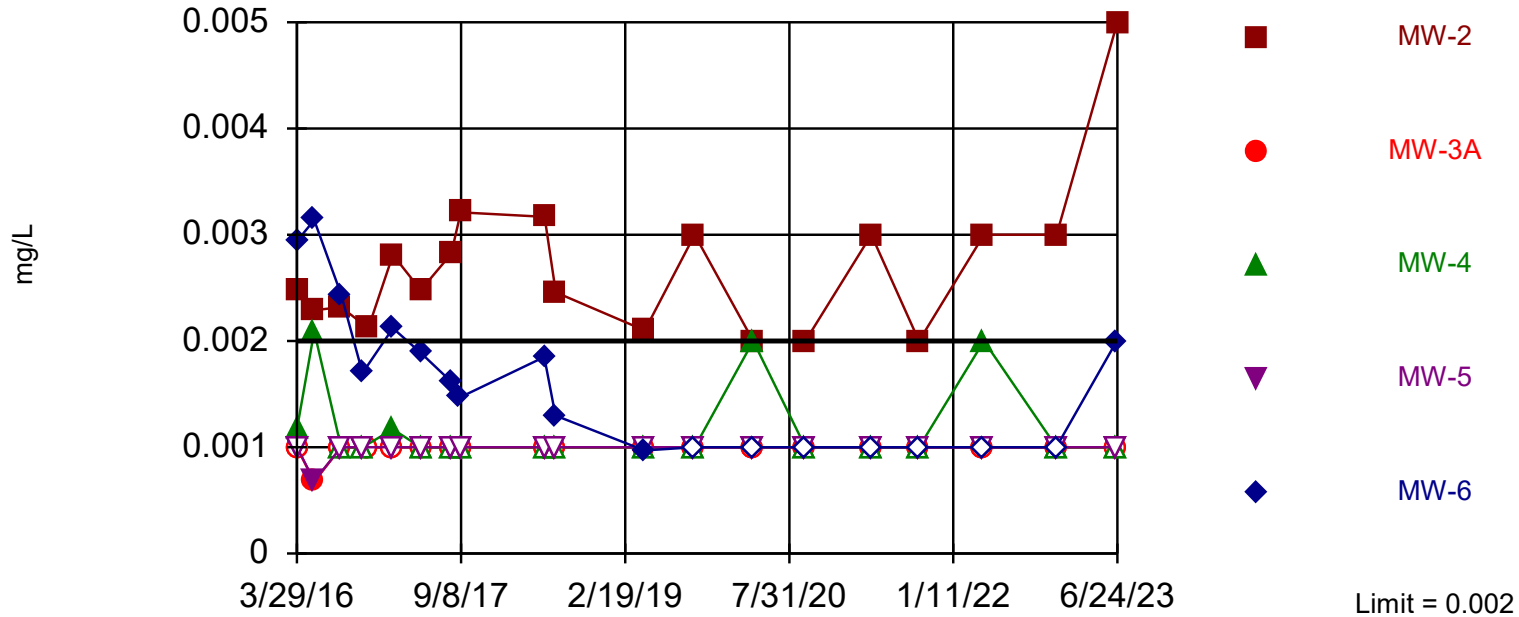


Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 95% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance well compared to limit. Distribution was found to be 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 1/8/2024 8:12 AM  
Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### 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. 47.37% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. 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.

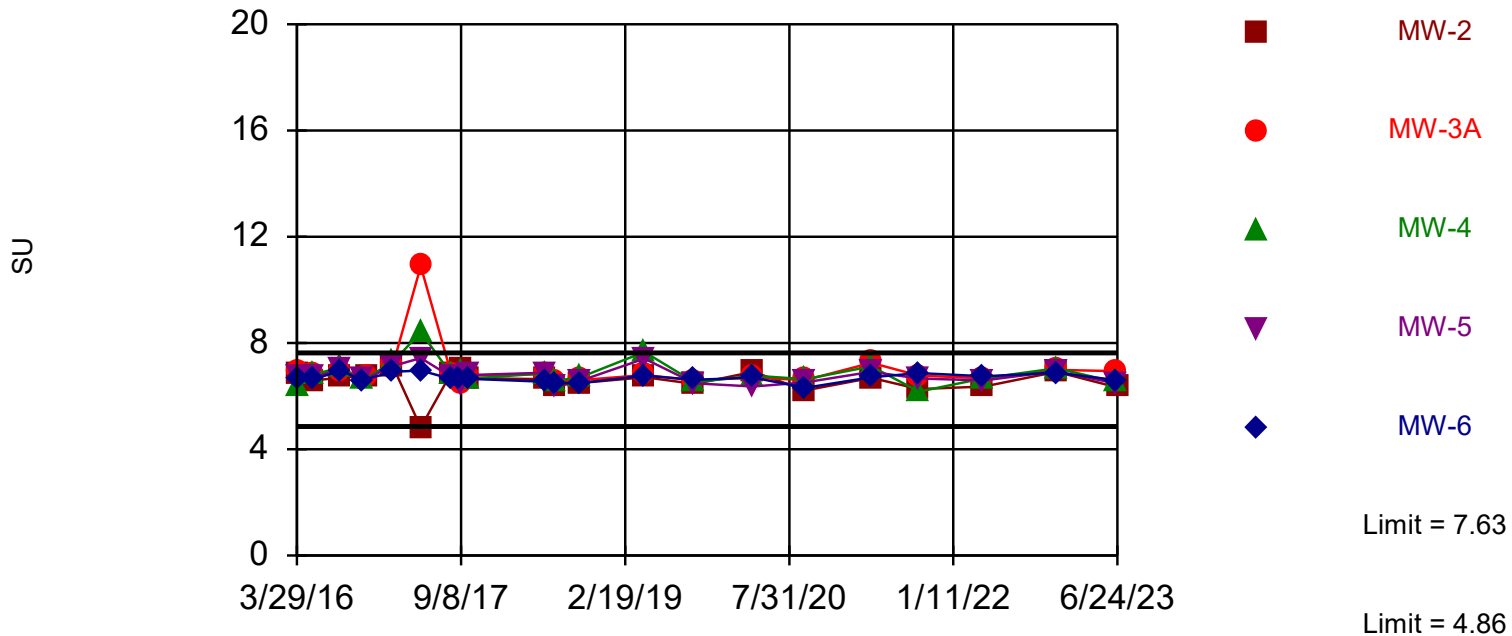
Constituent: Molybdenum Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 21 background values. Report alpha = 0.3846. Individual comparison alpha = 0.08363. 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.

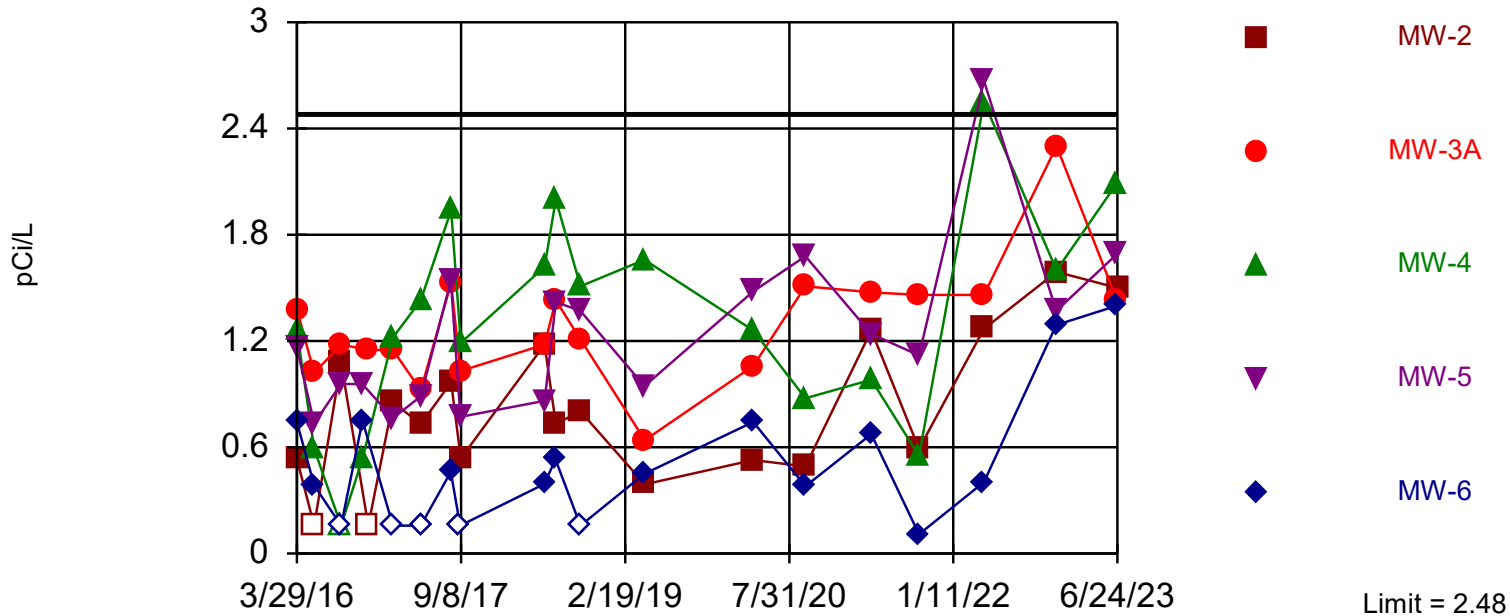
Constituent: pH [Field] Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

Prediction Limit

Interwell Parametric



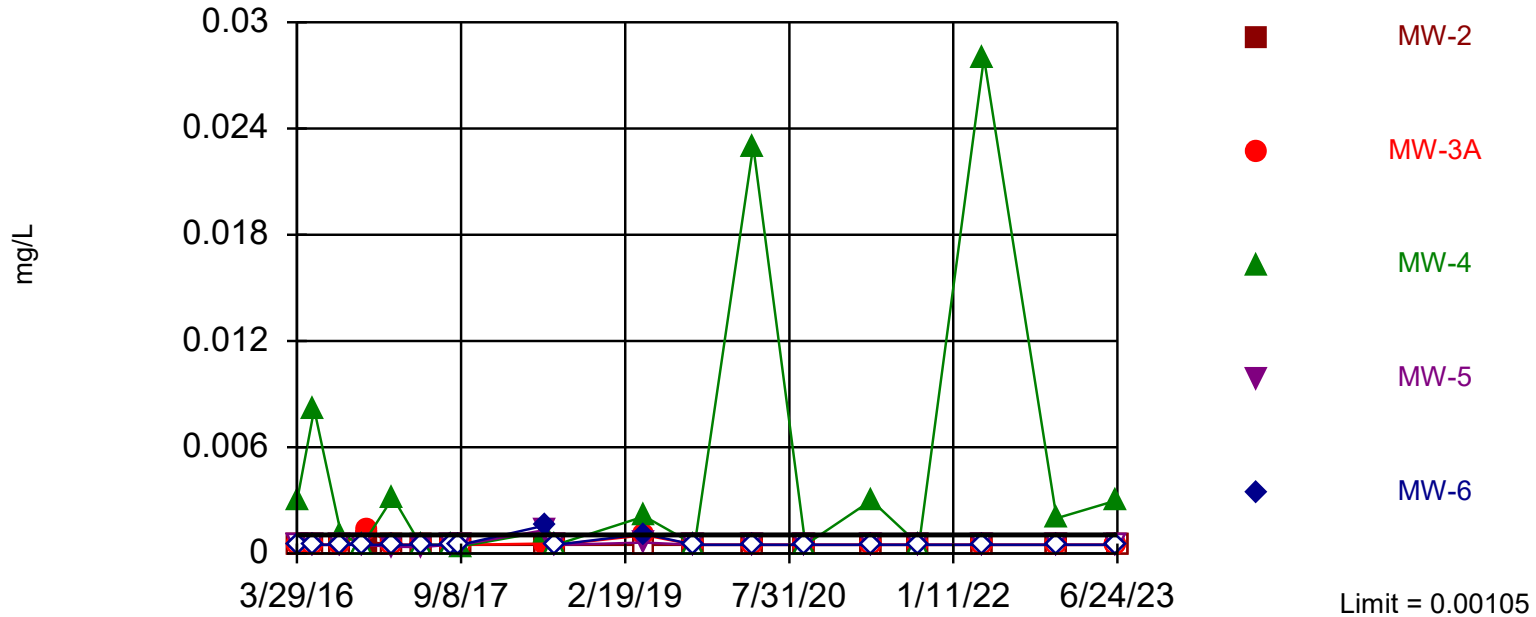
Background Data Summary (based on square root transformation): Mean=0.9615, Std. Dev.=0.2343, n=19. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9105, critical = 0.901. Report alpha = 0.04901. Individual comparison alpha = 0.01. 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: Radium 226 + 228 Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-4

### Prediction Limit Interwell Non-parametric



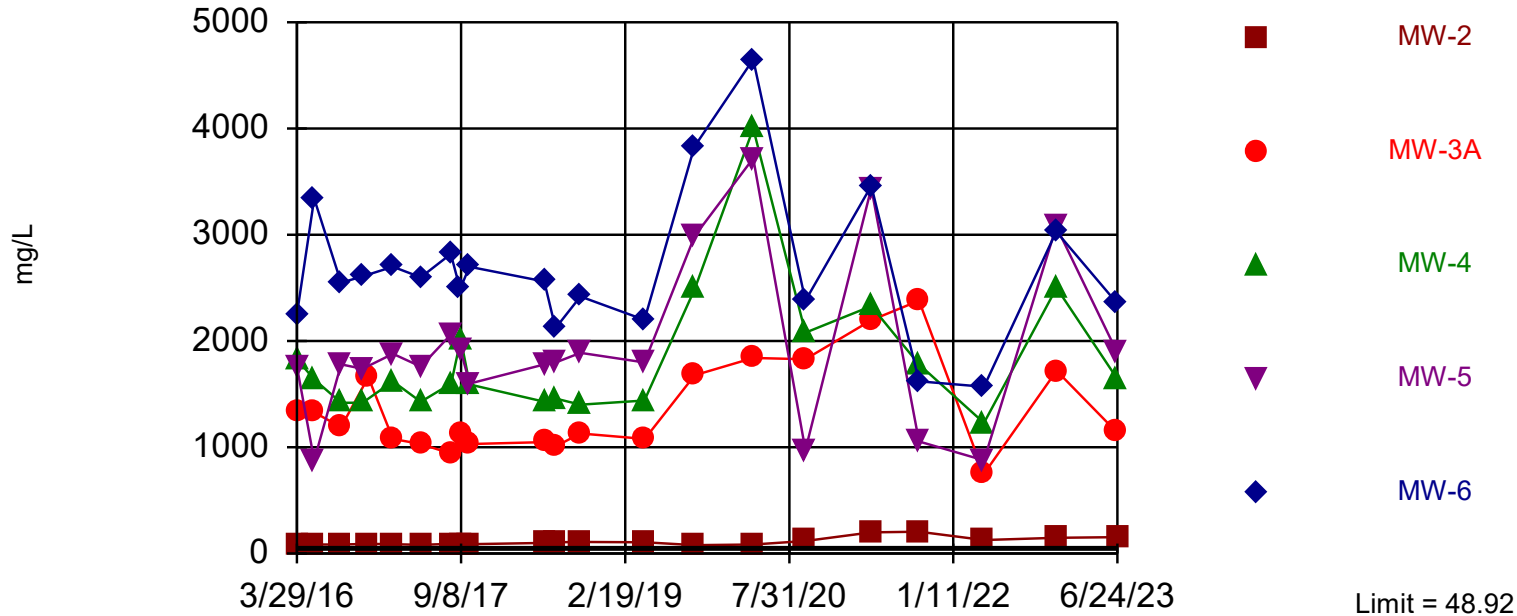
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 19 background values. 89.47% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each compliance well compared to limit. Distribution was found 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: Selenium Analysis Run 1/8/2024 8:12 AM  
Big Rivers Electric Corp. Data: Green LF All Data



Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

### Prediction Limit Interwell Parametric



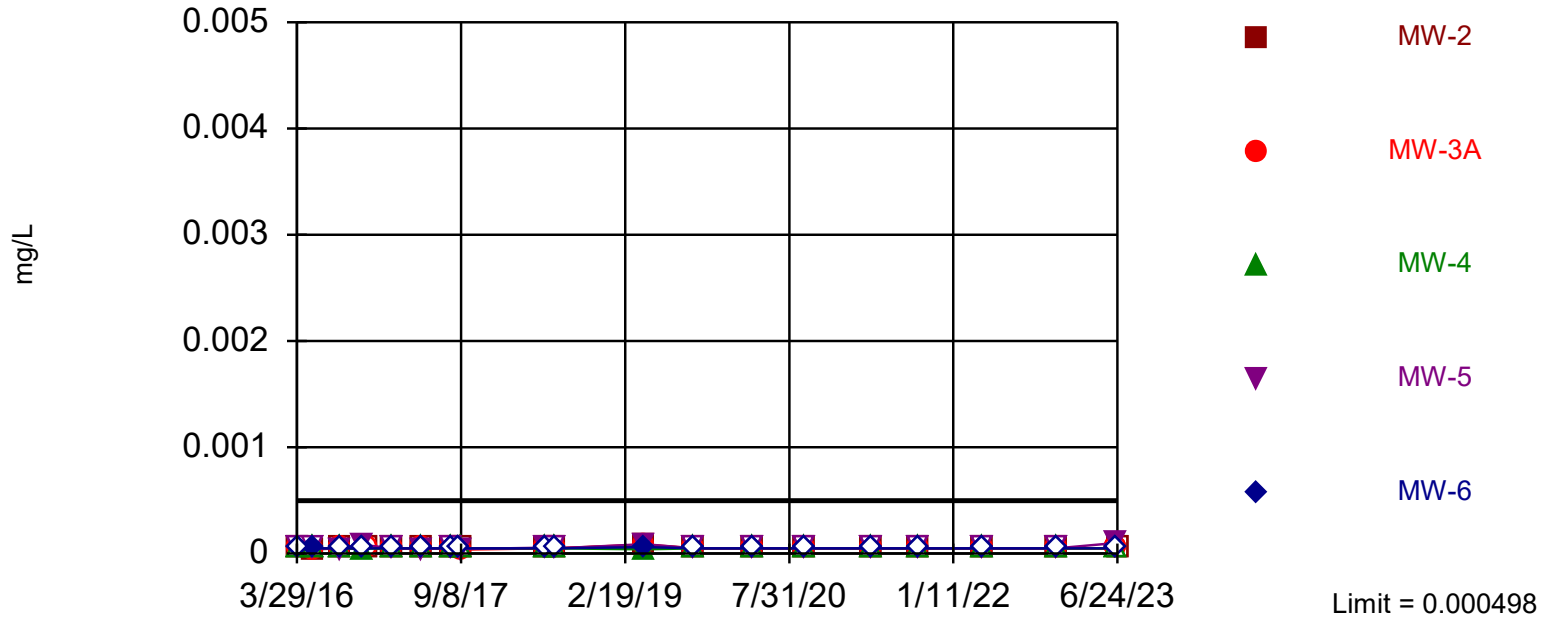
Background Data Summary (based on natural log transformation): Mean=3.283, Std. Dev.=0.2345, n=21. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9159, critical = 0.908. Report alpha = 0.04901. Individual comparison alpha = 0.01. 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: Sulfate Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit Interwell Non-parametric



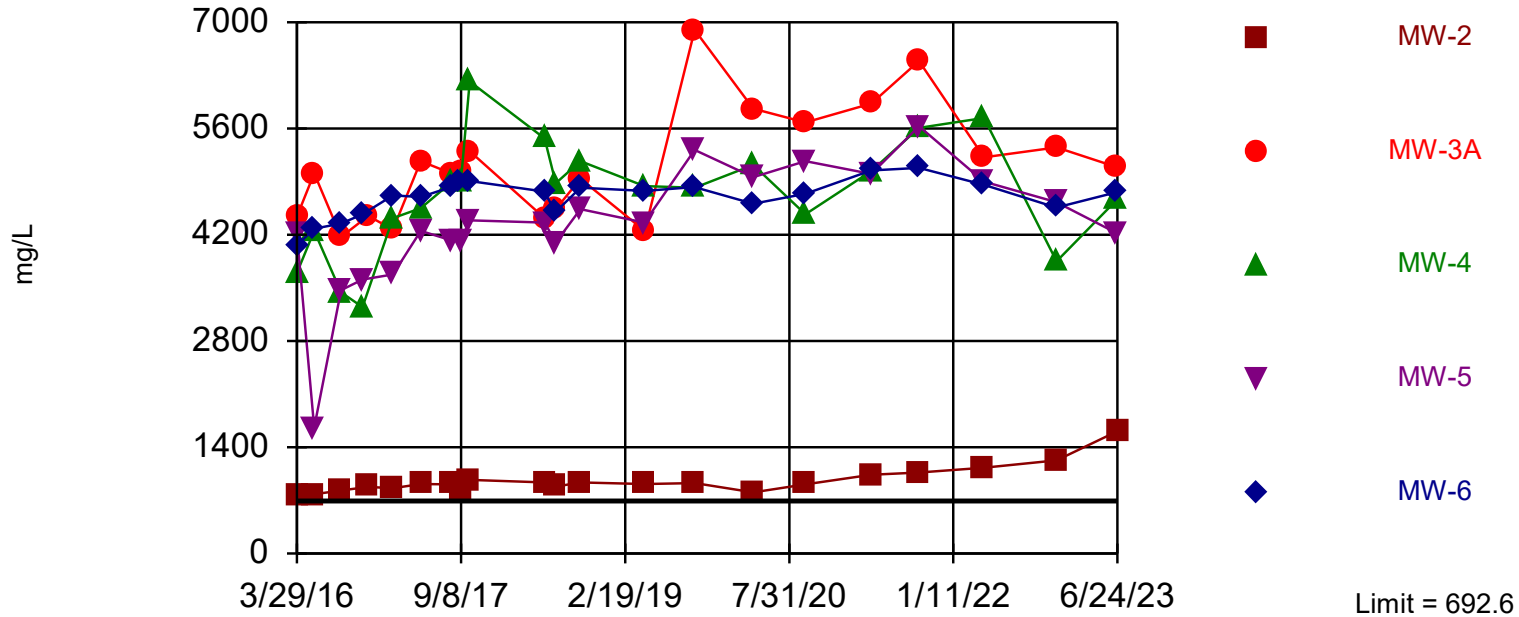
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 19 background values. 63.16% NDs. Report alpha = 0.2083. Individual comparison alpha = 0.04565. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Thallium Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit  
Interwell Parametric



Background Data Summary (based on  $x^4$  transformation): Mean= $1.2e11$ , Std. Dev.= $4.3e10$ ,  $n=21$ . Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @ $\alpha = 0.05$ , calculated = 0.9327, critical = 0.908. Report  $\alpha = 0.04901$ . Individual comparison  $\alpha = 0.01$ . 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.

Constituent: Total Dissolved Solids Analysis Run 1/8/2024 8:12 AM

Big Rivers Electric Corp. Data: Green LF All Data

# Confidence Interval

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 8:25 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic (mg/L)	MW-1 (bg)	0.0009104	0.0005289	0.01	No	20	10	x^(1/3)	0.05	Param.
<b>Arsenic (mg/L)</b>	<b>MW-2</b>	<b>0.02571</b>	<b>0.01455</b>	<b>0.01</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Arsenic (mg/L)	MW-3A	0.000574	0.0002	0.01	No	20	45	No	0.05	NP (normality)
Arsenic (mg/L)	MW-4	0.000449	0.0002	0.01	No	20	50	No	0.05	NP (normality)
Arsenic (mg/L)	MW-5	0.000424	0.0002	0.01	No	20	45	No	0.05	NP (normality)
Arsenic (mg/L)	MW-6	0.000553	0.0002	0.01	No	20	45	No	0.05	NP (normality)
Barium (mg/L)	MW-1 (bg)	0.08423	0.07827	2	No	20	0	No	0.05	Param.
Barium (mg/L)	MW-2	0.3412	0.3025	2	No	20	0	x^3	0.05	Param.
Barium (mg/L)	MW-3A	0.04588	0.04274	2	No	20	0	No	0.05	Param.
Barium (mg/L)	MW-4	0.02749	0.02366	2	No	20	0	No	0.05	Param.
Barium (mg/L)	MW-5	0.016	0.0135	2	No	20	0	No	0.05	NP (normality)
Barium (mg/L)	MW-6	0.01151	0.01006	2	No	20	0	No	0.05	Param.
Lithium (mg/L)	MW-1 (bg)	0.03159	0.02921	0.04	No	20	10	No	0.05	Param.
Lithium (mg/L)	MW-2	0.025	0.007	0.04	No	20	45	No	0.05	NP (normality)
<b>Lithium (mg/L)</b>	<b>MW-3A</b>	<b>0.7318</b>	<b>0.6759</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-4</b>	<b>1.519</b>	<b>1.159</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>5</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-5</b>	<b>0.4112</b>	<b>0.3495</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-6</b>	<b>0.05671</b>	<b>0.05017</b>	<b>0.04</b>	<b>Yes</b>	<b>20</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Mercury (ug/L)	MW-1 (bg)	0.1	0.1	2	No	20	95	No	0.05	NP (NDs)
Mercury (ug/L)	MW-2	0.1	0.1	2	No	20	100	No	0.05	NP (NDs)
Mercury (ug/L)	MW-3A	0.1	0.1	2	No	20	100	No	0.05	NP (NDs)
Mercury (ug/L)	MW-4	0.5317	0.3496	2	No	20	0	sqrt(x)	0.05	Param.
Mercury (ug/L)	MW-5	0.1	0.1	2	No	20	95	No	0.05	NP (NDs)
Mercury (ug/L)	MW-6	0.1	0.1	2	No	20	100	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-1 (bg)	0.00133	0.001	0.1	No	19	47.37	No	0.05	NP (normality)
Molybdenum (mg/L)	MW-2	0.003	0.00229	0.1	No	19	0	No	0.05	NP (normality)
Molybdenum (mg/L)	MW-3A	0.001	0.001	0.1	No	19	94.74	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-4	0.00117	0.001	0.1	No	19	73.68	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-5	0.001	0.001	0.1	No	19	94.74	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-6	0.00189	0.001	0.1	No	19	36.84	No	0.05	NP (normality)
Selenium (mg/L)	MW-1 (bg)	0.000652	0.0005	0.05	No	19	89.47	No	0.05	NP (NDs)
Selenium (mg/L)	MW-2	0.0005	0.0005	0.05	No	19	89.47	No	0.05	NP (NDs)
Selenium (mg/L)	MW-3A	0.000501	0.0005	0.05	No	19	78.95	No	0.05	NP (NDs)
Selenium (mg/L)	MW-4	0.003	0.0005	0.05	No	19	36.84	No	0.05	NP (normality)
Selenium (mg/L)	MW-5	0.000624	0.000384	0.05	No	19	78.95	No	0.05	NP (NDs)
Selenium (mg/L)	MW-6	0.0011	0.0005	0.05	No	19	89.47	No	0.05	NP (NDs)

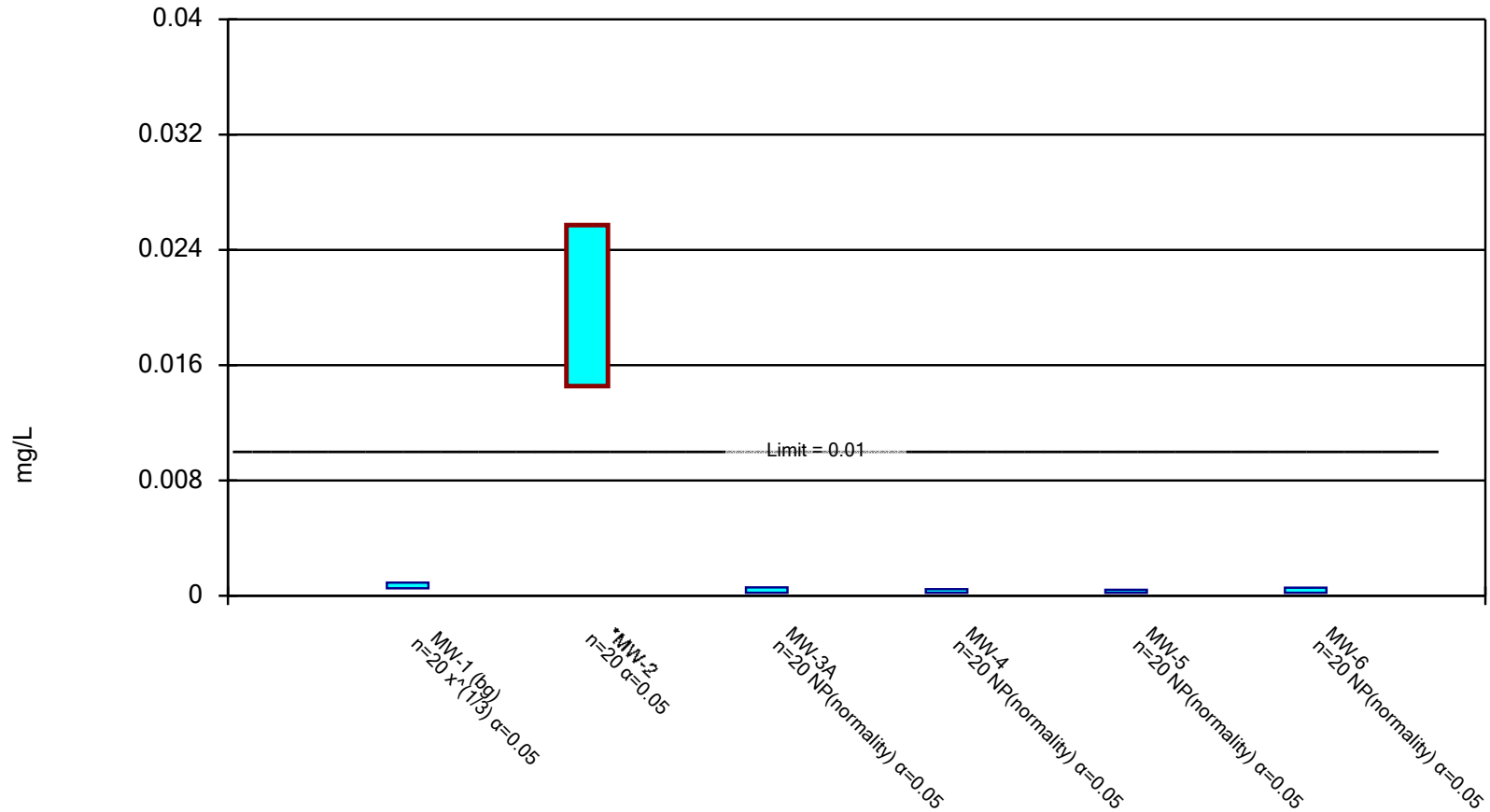
# Confidence Interval

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 8:25 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic (mg/L)	MW-2	0.02571	0.01455	0.01	Yes	20	0	No	0.05	Param.
Lithium (mg/L)	MW-3A	0.7318	0.6759	0.04	Yes	20	0	No	0.05	Param.
Lithium (mg/L)	MW-4	1.519	1.159	0.04	Yes	20	5	No	0.05	Param.
Lithium (mg/L)	MW-5	0.4112	0.3495	0.04	Yes	20	0	No	0.05	Param.
Lithium (mg/L)	MW-6	0.05671	0.05017	0.04	Yes	20	0	No	0.05	Param.

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.\* Normality Test: Shapiro Wilk, alpha based on n.

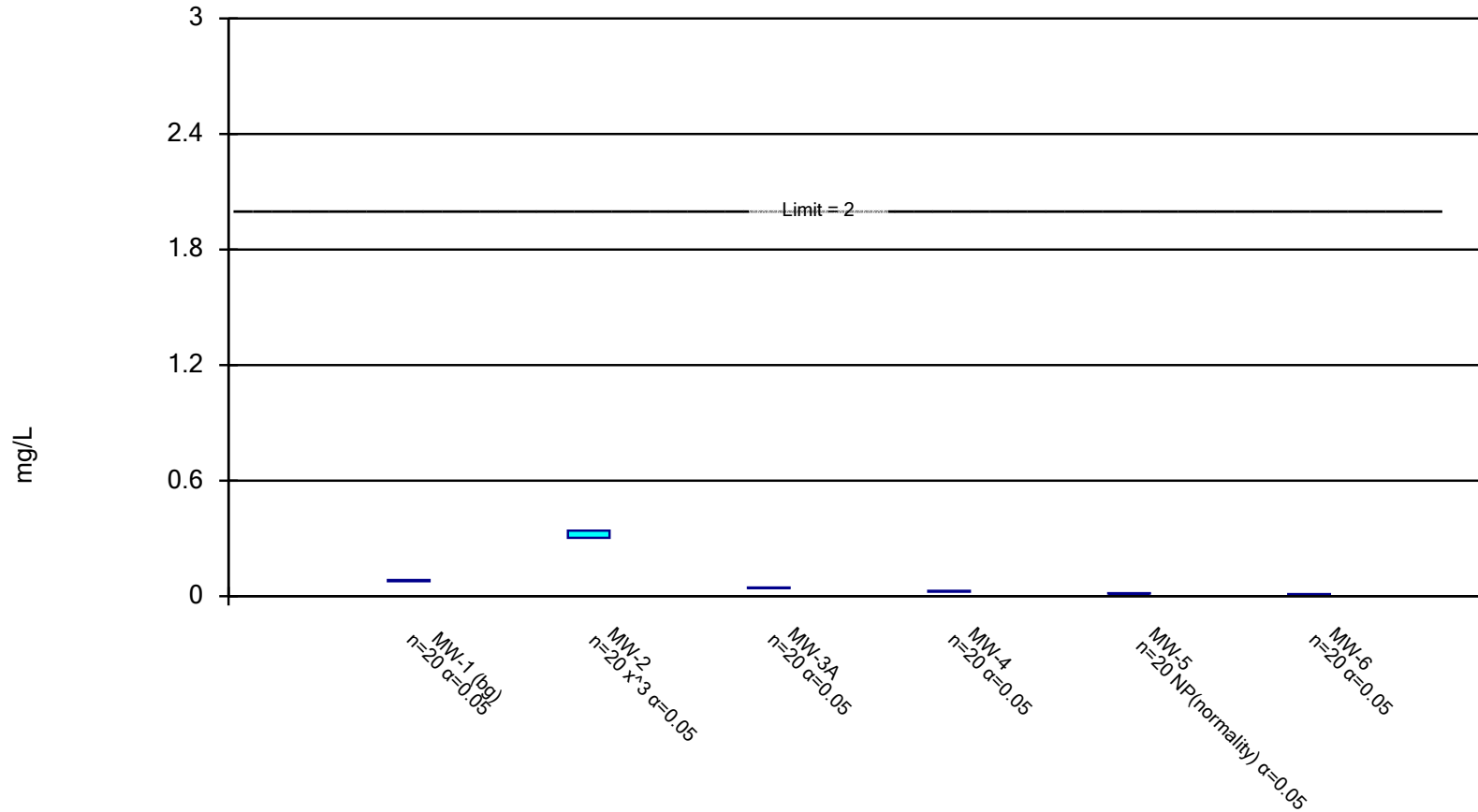


Constituent: Arsenic Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.



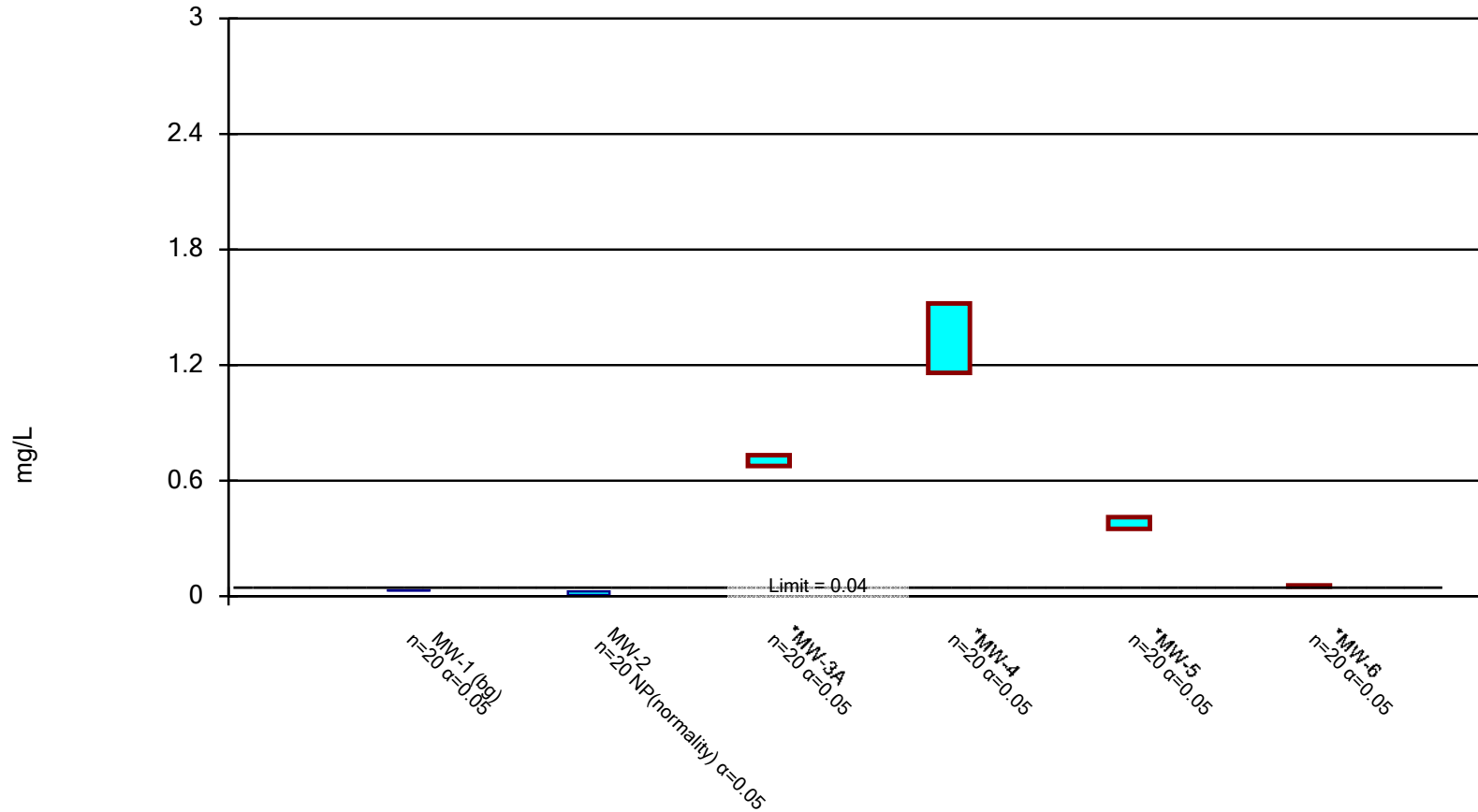
Constituent: Barium Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data



## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.\* Normality Test: Shapiro Wilk, alpha based on n.

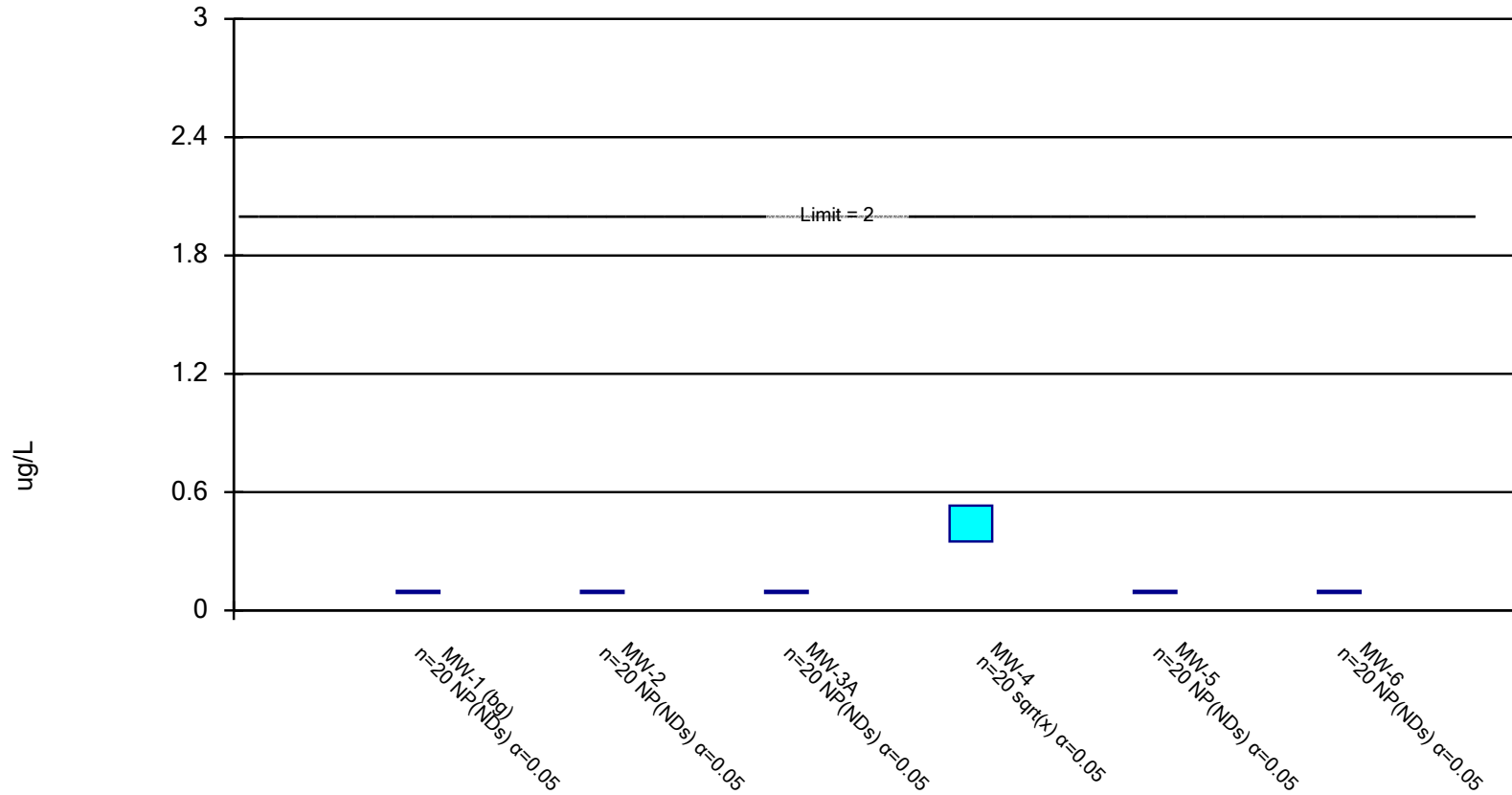


Constituent: Lithium Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.

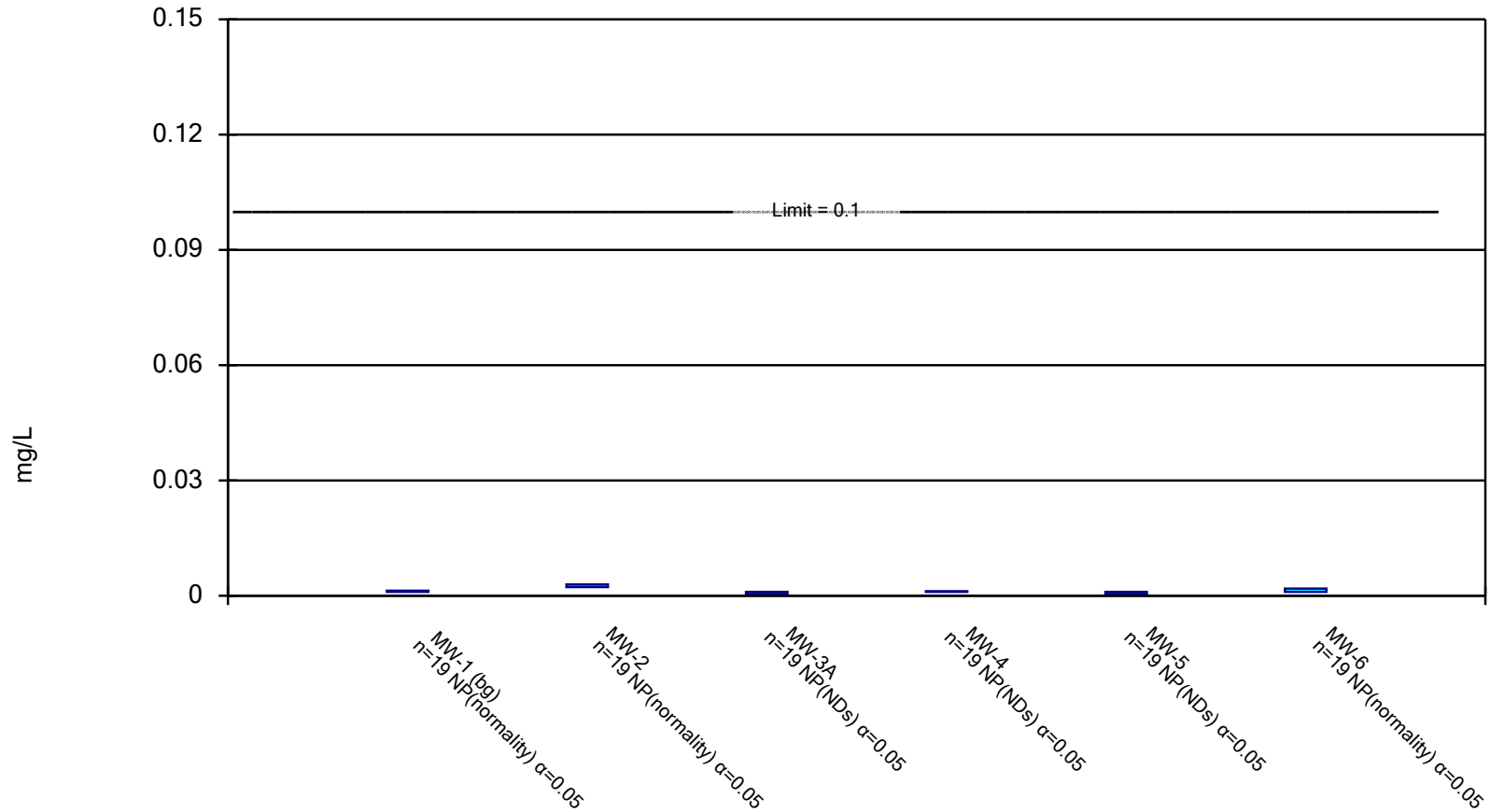


Constituent: Mercury Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data

# Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

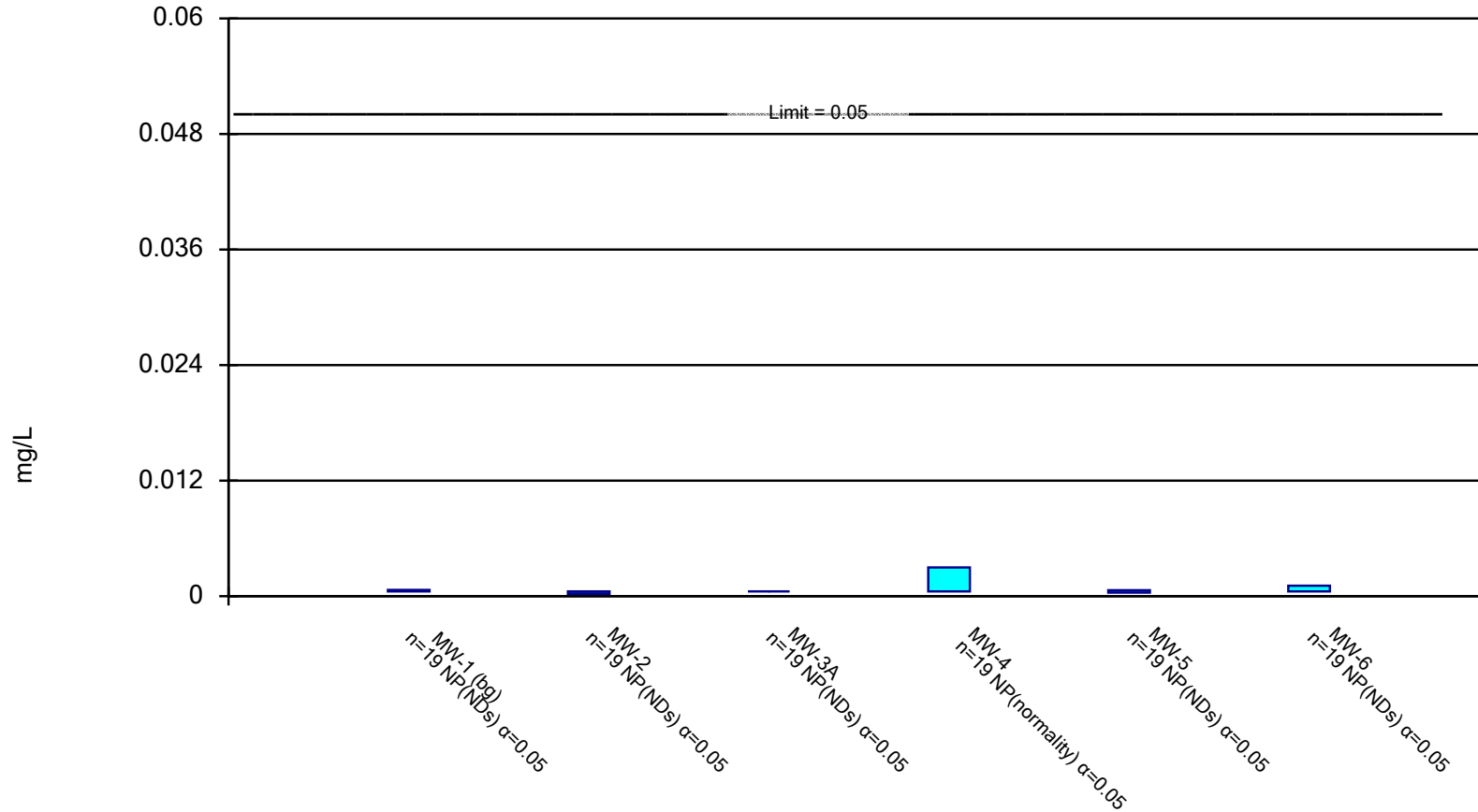


Constituent: Molybdenum Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data


# Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: Selenium Analysis Run 1/8/2024 8:24 AM

Big Rivers Electric Corp. Data: Green LF All Data



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January 26, 2023

Mr. Mark Bertram  
Big Rivers Electric Corporation  
9000 Highway 2096  
Robards, KY 42452

Re: Statistical Evaluation of November 2023 Assessment Monitoring Groundwater Data  
Sebree Generating Station Green Landfill in Robards, Kentucky  
Agency Interest ID #: 4196

Dear Mr. Bertram:

This letter presents the results of the statistical evaluation of analytical data from the November 2023 assessment monitoring event performed at the Sebree Generating Station's Green Landfill in Webster County, Robards, 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 November 2023 sampling results to calculated groundwater protection standards (GWPSs). The GWPSs for the groundwater monitoring network were reviewed and updated as part of the statistical evaluation completed for the November 2023 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 November 2023 data to the updated GWPSs is presented on Table 2. The statistical evaluation presented herein was performed in accordance with the *Groundwater Monitoring System and Statistical Methods* document prepared by Associated Engineers, Inc. and dated June 28, 2016.

In November 2023, the Sebree Generating Station's Green 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 the Green Landfill and the established maximum concentration limit (MCL) or the GWPS criteria presented in 40 CFR §257.95(h)(2) for select Appendix IV parameters without an MCL. This letter presents the results of the statistical evaluation of the November 2023 assessment monitoring event for inclusion in the Sebree Generating Station Operating Record.

### **Statistical Evaluation of Sebree Generating Station's Green Landfill Compliance Monitoring Well Network Evaluation**

An interwell prediction limit evaluation was performed to compare the concentrations of Appendix III and Appendix IV parameters observed in November 2023 compliance (downgradient) monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 to calculated

Mr. Mark Bertram  
Big Rivers Electric Corporation  
January 26, 2023  
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prediction limits (i.e., background limits) that were established using data collected from March of 2016 through November of 2023 from upgradient monitoring well MW-1. Certain Appendix III and Appendix IV parameters were detected in November 2023 at concentrations at or above the method detection limit. One or more of these detections resulted in statistically significant increases (SSI) above the calculated background limits (equivalent to the MW-1 prediction limits), and a summary of the statistical evaluation is included in Attachment 1. This included the following well/constituent pairs for downgradient compliance monitoring wells with SSIs above calculated background limits:

Appendix III Parameters:

- Calcium (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Chloride (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Sulfate (MW-2, MW-3A, MW-4, MW-5, and MW-6)
- Total Dissolved Solids (TDS) (MW-2, MW-3A, MW-4, MW-5, and MW-6)

Appendix IV Parameters:

- Arsenic (MW-2)
- Barium (MW-2)
- Lithium (MW-3A, MW-4, MW-5, and MW-6)
- Mercury (MW-4)
- Molybdenum (MW-2)

Results of SSIs above background were generally consistent with the 2016 through June 2023 statistical results. The Appendix III SSIs for calcium, chloride, sulfate, and TDS continue to occur at downgradient compliance monitoring wells. The reported Appendix IV SSIs for arsenic, barium, lithium, mercury, and molybdenum in this event are consistent with previous events. Lastly, the reported selenium SSI (MW-4) in the June 2023 event was not present in this event.

The Appendix IV constituents with SSIs (arsenic, barium, lithium, mercury, and molybdenum) 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 arsenic, barium, lithium, mercury, and molybdenum at downgradient compliance monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 resulted in the following well/constituent pairs with SSLs above the GWPS:



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- Arsenic (MW-2)
- Lithium (MW-3A, MW-4, MW-5, and MW-6)

The LCLs for the remaining well/constituent pairs for arsenic, barium, lithium, mercury, and molybdenum were either non-detect or 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 for arsenic (MW-2) and lithium (MW-3A, MW-4, MW-5, and MW-6) were consistent with the June 2023 results.

Given that certain Appendix III and IV constituents were observed at the Sebree Generating Station's Green Landfill groundwater monitoring network at concentrations above their respective calculated background limit and 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(e) and assessment monitoring will continue for the next semiannual monitoring event in 2024.

Sincerely,

Burns & McDonnell Engineering Company, Inc.



Chris Hوجلund, PG  
Project Manager

Attachments:

Table 1 – Calculated Background and Groundwater Protection Standards

Table 2 – Green Landfill - November 2023 Analytical Results

Attachment 1 – Sanitas™ Statistical Outputs

cc: Hunter Mizell, BREC Sebree Station

## **TABLES**

**TABLE 1**  
**Calculated Background and Groundwater Protection Standards**  
**Sebree Generating Station Green Landfill in Robards, Kentucky**

Detection Constituents (Appendix III)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Boron	mg/L	2.201	--	--	--
Calcium	mg/L	35.99	--	--	--
Chloride	mg/L	13.9	--	--	--
Fluoride	mg/L	0.888	4	--	4
pH (field)	s.u.	4.86 - 7.63	--	--	--
Sulfate	mg/L	48.49	--	--	--
TDS	mg/L	714.9	--	--	--
Assessment Constituents (Appendix IV)	Units	Background*	MCL	40 CFR §257.95(h)(2) Criteria	Groundwater Protection Standard
Antimony	mg/L	0.00297	0.006	--	0.006
Arsenic	mg/L	0.003955	0.01	--	0.01
Barium	mg/L	0.1006	2	--	2
Beryllium	mg/L	0.000533	0.004	--	0.004
Cadmium	mg/L	0.000299	0.005	--	0.005
Chromium	mg/L	0.00354	0.1	--	0.1
Cobalt	mg/L	0.002	--	0.006	0.006
Fluoride	mg/L	0.888	4	--	4
Lead	mg/L	0.000279	--	0.015	0.015
Lithium	mg/L	0.0396	--	0.04	0.04
Mercury	mg/L	0.0002	0.002	--	0.002
Molybdenum	mg/L	0.002	--	0.1	0.1
Combined Radium 226 and 228**	pCi/L	2.48	5	--	5
Selenium	mg/L	0.00105	0.05	--	0.05
Thallium	mg/L	0.000498	0.002	--	0.002

**Notes:**

\*Groundwater Protection Standards were developed in accordance with §257.95(h). Background concentrations were determined utilizing interwell prediction limits (see Attachment 1). Upgradient Monitoring Well MW-1 was used to calculate background concentrations. This included background data ranging from March 2016 through November 2023.

\*\*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.

CFR - Code of Federal Regulations

MCL - Maximum Contaminant Level

mg/L - milligrams per Liter

pCi/L - picocuries per Liter

s.u. - standard units

TDS - Total Dissolved Solids

**TABLE 2**  
**Green Landfill - November 2023 Analytical Results**  
**Sebree Generating Station**

APPENDIX III CONSTITUENTS	2H2023 Calculated Background	2023 GWPS	2023 GWPS Reference	Units	MW-1	MW-2	MW-3A	MW-4	MW-5	MW-6	
					Background Well	Downgradient Compliance Wells					
					Detection Monitoring						
Boron	2.201	--	Background	mg/L	1.65 D1	0.1 U	0.31	0.81	0.21	0.15 M2	
Calcium	35.99	--	Background	mg/L	25.2 D1	<b>179</b> D1	<b>475</b> D1	<b>702</b> D1	<b>439</b> D1	<b>375</b> D1, M3	
Chloride	13.9	--	Background	mg/L	5.7	<b>185</b> D	<b>1190</b> D,J	<b>1090</b> D	<b>992</b> D	<b>192</b> D, M3	
Fluoride	0.888	4	MCL	mg/L	0.6	0.3	0.4	0.2	0.2	0.5 J-	
pH (Field Measurement)	4.86 - 7.63	--	Background	s.u.	6.78	6.46	6.48	6.32	6.36	6.34	
Sulfate	48.49	--	Background	mg/L	30	<b>159</b>	<b>2530</b> D,J	<b>1890</b> D	<b>2390</b> D	<b>8480</b> D, M3	
Total Dissolved Solids	714.9	--	Background	mg/L	684	<b>1060</b>	<b>3630</b> J	<b>4080</b>	<b>4650</b>	<b>4030</b>	
<b>APPENDIX IV CONSTITUENTS</b>											
Antimony	0.00297	0.006	MCL	mg/L	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	0.002 U	
Arsenic	0.003955	0.01	MCL	mg/L	0.0016	<b>0.0283</b>	0.0004 U	0.0004 U	0.0004 U	0.0004 U	
Barium	0.1006	2	MCL	mg/L	0.079	<b>0.27</b>	0.038	0.02	0.011	0.009	
Beryllium	0.000533	0.004	MCL	mg/L	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	
Cadmium	0.000299	0.005	MCL	mg/L	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	
Chromium	0.00354	0.1	MCL	mg/L	0.0006 U	0.0006 U	0.0006 U	0.0008 J	0.0006 U	0.0006 U	
Cobalt	0.002	0.006	40 CFR §257.95(h)(2) Criteria	mg/L	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	
Fluoride	0.888	4	MCL	mg/L	0.6	0.3	0.4	0.2	0.2	0.5 J-	
Lead	0.000279	0.015	40 CFR §257.95(h)(2) Criteria	mg/L	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	0.0005 U	
Lithium	0.0396	0.04	40 CFR §257.95(h)(2) Criteria	mg/L	0.03	0.005 J	<b>0.71</b>	<b>0.99</b> D1	<b>0.36</b>	<b>0.04</b>	
Mercury	0.0002	0.002	MCL	mg/L	0.0002 U	0.0002 U	0.0002 U	<b>0.0004</b> J	0.0002 J	0.0002 U	
Molybdenum	0.002	0.1	40 CFR §257.95(h)(2) Criteria	mg/L	0.002 U	<b>0.003</b> J	0.002 U	0.002 U	0.002 U	0.002 U	
Combined Radium 226+228 (calculated)	2.48	5	MCL	pCi/L	0.176 J	0.00129 J	2.45 J	1.32 J	1.12 J	0.220 J	
Selenium	0.00105	0.05	MCL	mg/L	0.001 U	0.001 U	0.001 U	0.001 J	0.001 U	0.001 U	
Thallium	0.000498	0.002	MCL	mg/L	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U	

**Bold** - Analyte detected above calculated background concentration.

Parameter was detected in well located downgradient of the CCR Landfill at a statistically significant level above its GWPS.

D = Results reported from dilution.

D1 = Sample required dilution due to high concentration of target analysis.

GWPS = Groundwater Protection Standard

J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is qualified as estimated.

J- = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is qualified as estimated potential low bias.

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.

MCL - Maximum Contaminant Level

mg/L = milligrams per liter

pCi/L = picocuries per Liter

s.u. = standard units

U = Target analyte was analyzed, but was below detection limit.

**ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS**

# Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 7:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (mg/L)	MW-2	0.00297	n/a	11/7/2023	0.001ND	No	20	60	n/a	0.04365	NP Inter (NDs)
Antimony (mg/L)	MW-3A	0.00297	n/a	11/8/2023	0.001ND	No	20	60	n/a	0.04365	NP Inter (NDs)
Antimony (mg/L)	MW-4	0.00297	n/a	11/7/2023	0.001ND	No	20	60	n/a	0.04365	NP Inter (NDs)
Antimony (mg/L)	MW-5	0.00297	n/a	11/7/2023	0.001ND	No	20	60	n/a	0.04365	NP Inter (NDs)
Antimony (mg/L)	MW-6	0.00297	n/a	11/8/2023	0.001ND	No	20	60	n/a	0.04365	NP Inter (NDs)
<b>Arsenic (mg/L)</b>	<b>MW-2</b>	<b>0.003955</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.0283</b>	<b>Yes</b>	<b>21</b>	<b>9.524</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
Arsenic (mg/L)	MW-3A	0.003955	n/a	11/8/2023	0.0002ND	No	21	9.524	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-4	0.003955	n/a	11/7/2023	0.0002ND	No	21	9.524	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-5	0.003955	n/a	11/7/2023	0.0002ND	No	21	9.524	ln(x)	0.01	Param Inter
Arsenic (mg/L)	MW-6	0.003955	n/a	11/8/2023	0.0002ND	No	21	9.524	ln(x)	0.01	Param Inter
<b>Barium (mg/L)</b>	<b>MW-2</b>	<b>0.1006</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.27</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
Barium (mg/L)	MW-3A	0.1006	n/a	11/8/2023	0.038	No	21	0	No	0.01	Param Inter
Barium (mg/L)	MW-4	0.1006	n/a	11/7/2023	0.02	No	21	0	No	0.01	Param Inter
Barium (mg/L)	MW-5	0.1006	n/a	11/7/2023	0.011	No	21	0	No	0.01	Param Inter
Barium (mg/L)	MW-6	0.1006	n/a	11/8/2023	0.009	No	21	0	No	0.01	Param Inter
Beryllium (mg/L)	MW-2	0.000533	n/a	11/7/2023	0.0005ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Beryllium (mg/L)	MW-3A	0.000533	n/a	11/8/2023	0.0005ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Beryllium (mg/L)	MW-4	0.000533	n/a	11/7/2023	0.0005ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Beryllium (mg/L)	MW-5	0.000533	n/a	11/7/2023	0.0005ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Beryllium (mg/L)	MW-6	0.000533	n/a	11/8/2023	0.0005ND	No	20	95	n/a	0.04365	NP Inter (NDs)
Boron (mg/L)	MW-2	2.201	n/a	11/7/2023	0.05ND	No	22	0	No	0.01	Param Inter
Boron (mg/L)	MW-3A	2.201	n/a	11/8/2023	0.31	No	22	0	No	0.01	Param Inter
Boron (mg/L)	MW-4	2.201	n/a	11/7/2023	0.81	No	22	0	No	0.01	Param Inter
Boron (mg/L)	MW-5	2.201	n/a	11/7/2023	0.21	No	22	0	No	0.01	Param Inter
Boron (mg/L)	MW-6	2.201	n/a	11/8/2023	0.15	No	22	0	No	0.01	Param Inter
Cadmium (mg/L)	MW-2	0.000299	n/a	11/7/2023	0.00005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Cadmium (mg/L)	MW-3A	0.000299	n/a	11/8/2023	0.00005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Cadmium (mg/L)	MW-4	0.000299	n/a	11/7/2023	0.00005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Cadmium (mg/L)	MW-5	0.000299	n/a	11/7/2023	0.00005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Cadmium (mg/L)	MW-6	0.000299	n/a	11/8/2023	0.00005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
<b>Calcium (mg/L)</b>	<b>MW-2</b>	<b>35.99</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>179</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-3A</b>	<b>35.99</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>475</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-4</b>	<b>35.99</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>702</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-5</b>	<b>35.99</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>439</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Calcium (mg/L)</b>	<b>MW-6</b>	<b>35.99</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>375</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>No</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Chloride (mg/L)</b>	<b>MW-2</b>	<b>13.9</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>185</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>n/a</b>	<b>0.04013</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-3A</b>	<b>13.9</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>1190</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>n/a</b>	<b>0.04013</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-4</b>	<b>13.9</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>1090</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>n/a</b>	<b>0.04013</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-5</b>	<b>13.9</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>992</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>n/a</b>	<b>0.04013</b>	<b>NP Inter (normality)</b>
<b>Chloride (mg/L)</b>	<b>MW-6</b>	<b>13.9</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>192</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>n/a</b>	<b>0.04013</b>	<b>NP Inter (normality)</b>
Chromium (mg/L)	MW-2	0.00354	n/a	11/7/2023	0.0003ND	No	20	75	n/a	0.04365	NP Inter (NDs)
Chromium (mg/L)	MW-3A	0.00354	n/a	11/8/2023	0.0003ND	No	20	75	n/a	0.04365	NP Inter (NDs)
Chromium (mg/L)	MW-4	0.00354	n/a	11/7/2023	0.0008J	No	20	75	n/a	0.04365	NP Inter (NDs)
Chromium (mg/L)	MW-5	0.00354	n/a	11/7/2023	0.0003ND	No	20	75	n/a	0.04365	NP Inter (NDs)
Chromium (mg/L)	MW-6	0.00354	n/a	11/8/2023	0.0003ND	No	20	75	n/a	0.04365	NP Inter (NDs)
Cobalt (mg/L)	MW-2	0.002	n/a	11/7/2023	0.002ND	No	20	45	n/a	0.04365	NP Inter (normality)
Cobalt (mg/L)	MW-3A	0.002	n/a	11/8/2023	0.002ND	No	20	45	n/a	0.04365	NP Inter (normality)
Cobalt (mg/L)	MW-4	0.002	n/a	11/7/2023	0.002ND	No	20	45	n/a	0.04365	NP Inter (normality)
Cobalt (mg/L)	MW-5	0.002	n/a	11/7/2023	0.002ND	No	20	45	n/a	0.04365	NP Inter (normality)
Cobalt (mg/L)	MW-6	0.002	n/a	11/8/2023	0.002ND	No	20	45	n/a	0.04365	NP Inter (normality)

## Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 7:39 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Fluoride (mg/L)	MW-2	0.888	n/a	11/7/2023	0.3	No	22	0	n/a	0.04013	NP Inter (normality)
Fluoride (mg/L)	MW-3A	0.888	n/a	11/8/2023	0.4	No	22	0	n/a	0.04013	NP Inter (normality)
Fluoride (mg/L)	MW-4	0.888	n/a	11/7/2023	0.2	No	22	0	n/a	0.04013	NP Inter (normality)
Fluoride (mg/L)	MW-5	0.888	n/a	11/7/2023	0.2	No	22	0	n/a	0.04013	NP Inter (normality)
Fluoride (mg/L)	MW-6	0.888	n/a	11/8/2023	0.5	No	22	0	n/a	0.04013	NP Inter (normality)
Lead (mg/L)	MW-2	0.000279	n/a	11/7/2023	0.00025ND	No	20	70	n/a	0.04365	NP Inter (NDs)
Lead (mg/L)	MW-3A	0.000279	n/a	11/8/2023	0.00025ND	No	20	70	n/a	0.04365	NP Inter (NDs)
Lead (mg/L)	MW-4	0.000279	n/a	11/7/2023	0.00025ND	No	20	70	n/a	0.04365	NP Inter (NDs)
Lead (mg/L)	MW-5	0.000279	n/a	11/7/2023	0.00025ND	No	20	70	n/a	0.04365	NP Inter (NDs)
Lead (mg/L)	MW-6	0.000279	n/a	11/8/2023	0.00025ND	No	20	70	n/a	0.04365	NP Inter (NDs)
Lithium (mg/L)	MW-2	0.0396	n/a	11/7/2023	0.005J	No	21	9.524	n/a	0.04182	NP Inter (normality)
<b>Lithium (mg/L)</b>	<b>MW-3A</b>	<b>0.0396</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>0.71</b>	<b>Yes</b>	<b>21</b>	<b>9.524</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-4</b>	<b>0.0396</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.99</b>	<b>Yes</b>	<b>21</b>	<b>9.524</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-5</b>	<b>0.0396</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.36</b>	<b>Yes</b>	<b>21</b>	<b>9.524</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
<b>Lithium (mg/L)</b>	<b>MW-6</b>	<b>0.0396</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>0.04</b>	<b>Yes</b>	<b>21</b>	<b>9.524</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (normality)</b>
Mercury (ug/L)	MW-2	0.2	n/a	11/7/2023	0.1ND	No	21	95.24	n/a	0.04182	NP Inter (NDs)
Mercury (ug/L)	MW-3A	0.2	n/a	11/8/2023	0.1ND	No	21	95.24	n/a	0.04182	NP Inter (NDs)
<b>Mercury (ug/L)</b>	<b>MW-4</b>	<b>0.2</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.4</b>	<b>Yes</b>	<b>21</b>	<b>95.24</b>	<b>n/a</b>	<b>0.04182</b>	<b>NP Inter (NDs)</b>
Mercury (ug/L)	MW-5	0.2	n/a	11/7/2023	0.2J	No	21	95.24	n/a	0.04182	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	11/8/2023	0.1ND	No	21	95.24	n/a	0.04182	NP Inter (NDs)
<b>Molybdenum (mg/L)</b>	<b>MW-2</b>	<b>0.002</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>0.003</b>	<b>Yes</b>	<b>20</b>	<b>50</b>	<b>n/a</b>	<b>0.04365</b>	<b>NP Inter (normality)</b>
Molybdenum (mg/L)	MW-3A	0.002	n/a	11/8/2023	0.001ND	No	20	50	n/a	0.04365	NP Inter (normality)
Molybdenum (mg/L)	MW-4	0.002	n/a	11/7/2023	0.001ND	No	20	50	n/a	0.04365	NP Inter (normality)
Molybdenum (mg/L)	MW-5	0.002	n/a	11/7/2023	0.001ND	No	20	50	n/a	0.04365	NP Inter (normality)
Molybdenum (mg/L)	MW-6	0.002	n/a	11/8/2023	0.001ND	No	20	50	n/a	0.04365	NP Inter (normality)
pH [Field] (SU)	MW-2	7.63	4.86	11/7/2023	6.46	No	22	0	n/a	0.08026	NP Inter (normality)
pH [Field] (SU)	MW-3A	7.63	4.86	11/8/2023	6.48	No	22	0	n/a	0.08026	NP Inter (normality)
pH [Field] (SU)	MW-4	7.63	4.86	11/7/2023	6.32	No	22	0	n/a	0.08026	NP Inter (normality)
pH [Field] (SU)	MW-5	7.63	4.86	11/7/2023	6.36	No	22	0	n/a	0.08026	NP Inter (normality)
pH [Field] (SU)	MW-6	7.63	4.86	11/8/2023	6.34	No	22	0	n/a	0.08026	NP Inter (normality)
Radium 226 + 228 (pCi/L)	MW-2	2.48	n/a	11/7/2023	0.001	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-3A	2.48	n/a	11/8/2023	2.45	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-4	2.48	n/a	11/7/2023	1.32	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	2.48	n/a	11/7/2023	1.12	No	19	0	sqrt(x)	0.01	Param Inter
Radium 226 + 228 (pCi/L)	MW-6	2.48	n/a	11/8/2023	0.22	No	19	0	sqrt(x)	0.01	Param Inter
Selenium (mg/L)	MW-2	0.00105	n/a	11/7/2023	0.0005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Selenium (mg/L)	MW-3A	0.00105	n/a	11/8/2023	0.0005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Selenium (mg/L)	MW-4	0.00105	n/a	11/7/2023	0.001J	No	20	90	n/a	0.04365	NP Inter (NDs)
Selenium (mg/L)	MW-5	0.00105	n/a	11/7/2023	0.0005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
Selenium (mg/L)	MW-6	0.00105	n/a	11/8/2023	0.0005ND	No	20	90	n/a	0.04365	NP Inter (NDs)
<b>Sulfate (mg/L)</b>	<b>MW-2</b>	<b>48.49</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>159</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-3A</b>	<b>48.49</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>2530</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-4</b>	<b>48.49</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>1890</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-5</b>	<b>48.49</b>	<b>n/a</b>	<b>11/7/2023</b>	<b>2390</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
<b>Sulfate (mg/L)</b>	<b>MW-6</b>	<b>48.49</b>	<b>n/a</b>	<b>11/8/2023</b>	<b>8480</b>	<b>Yes</b>	<b>22</b>	<b>0</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param Inter</b>
Thallium (mg/L)	MW-2	0.000498	n/a	11/7/2023	0.00005ND	No	20	65	n/a	0.04365	NP Inter (NDs)
Thallium (mg/L)	MW-3A	0.000498	n/a	11/8/2023	0.00005ND	No	20	65	n/a	0.04365	NP Inter (NDs)
Thallium (mg/L)	MW-4	0.000498	n/a	11/7/2023	0.00005ND	No	20	65	n/a	0.04365	NP Inter (NDs)
Thallium (mg/L)	MW-5	0.000498	n/a	11/7/2023	0.00005ND	No	20	65	n/a	0.04365	NP Inter (NDs)
Thallium (mg/L)	MW-6	0.000498	n/a	11/8/2023	0.00005ND	No	20	65	n/a	0.04365	NP Inter (NDs)



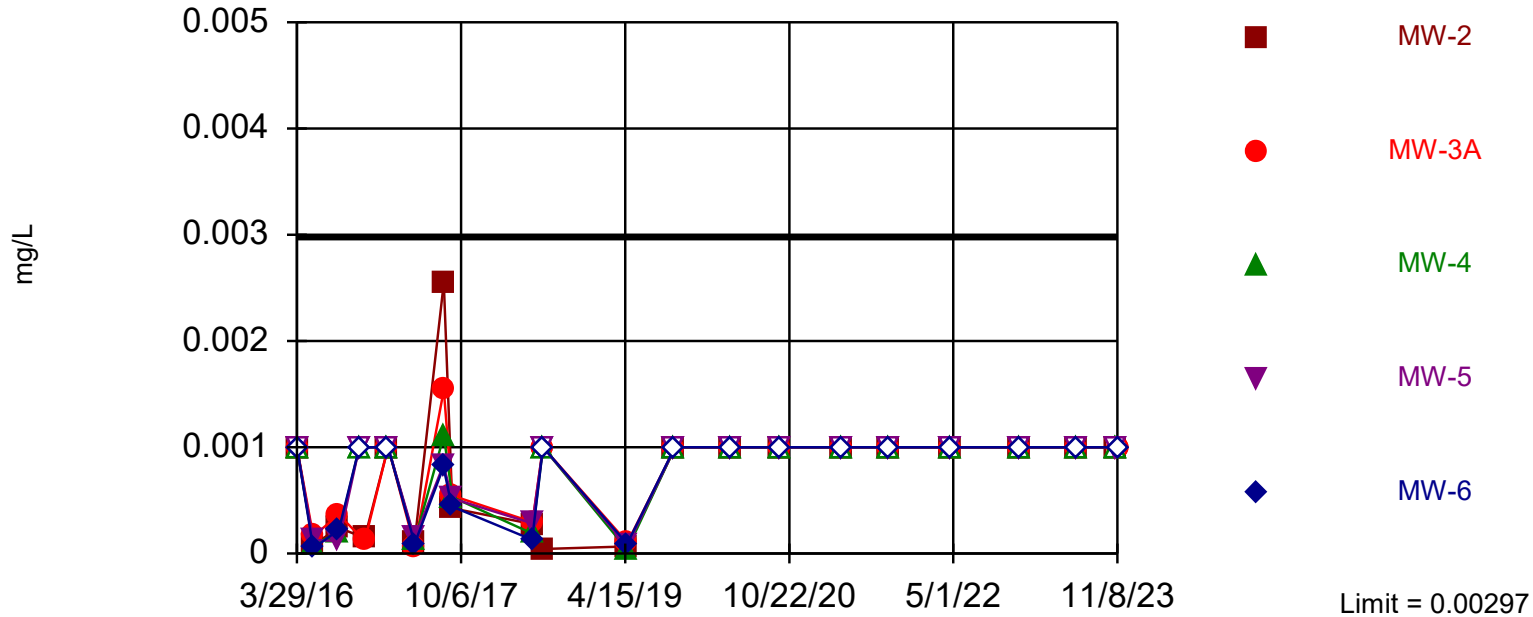
# Prediction Limit

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 7:39 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Total Dissolved Solids (mg/L)	MW-2	714.9	n/a	11/7/2023	1060	Yes	22	0	x^3	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-3A	714.9	n/a	11/8/2023	3630	Yes	22	0	x^3	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-4	714.9	n/a	11/7/2023	4080	Yes	22	0	x^3	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-5	714.9	n/a	11/7/2023	4650	Yes	22	0	x^3	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-6	714.9	n/a	11/8/2023	4030	Yes	22	0	x^3	0.01	Param Inter

Within Limit

### Prediction Limit Interwell Non-parametric



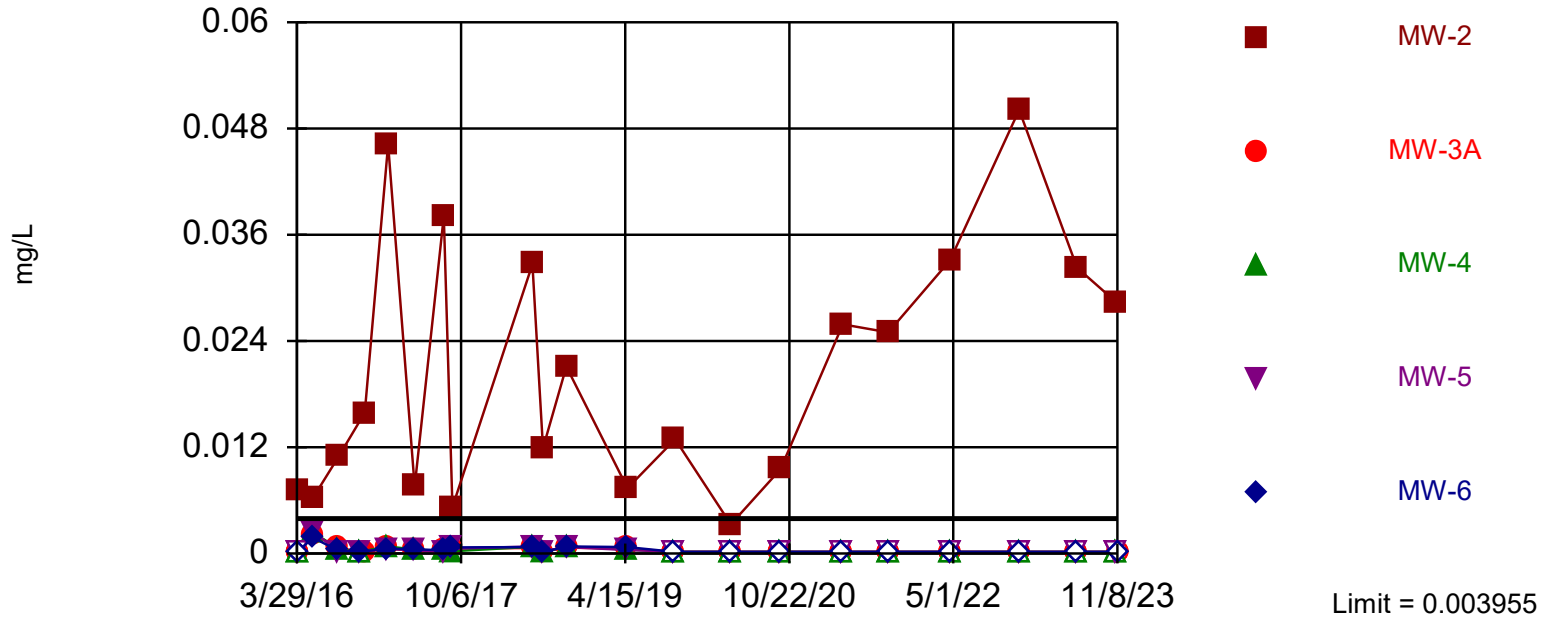
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 60% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance well compared to limit. Distribution was found to be 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 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### Prediction Limit Interwell Parametric



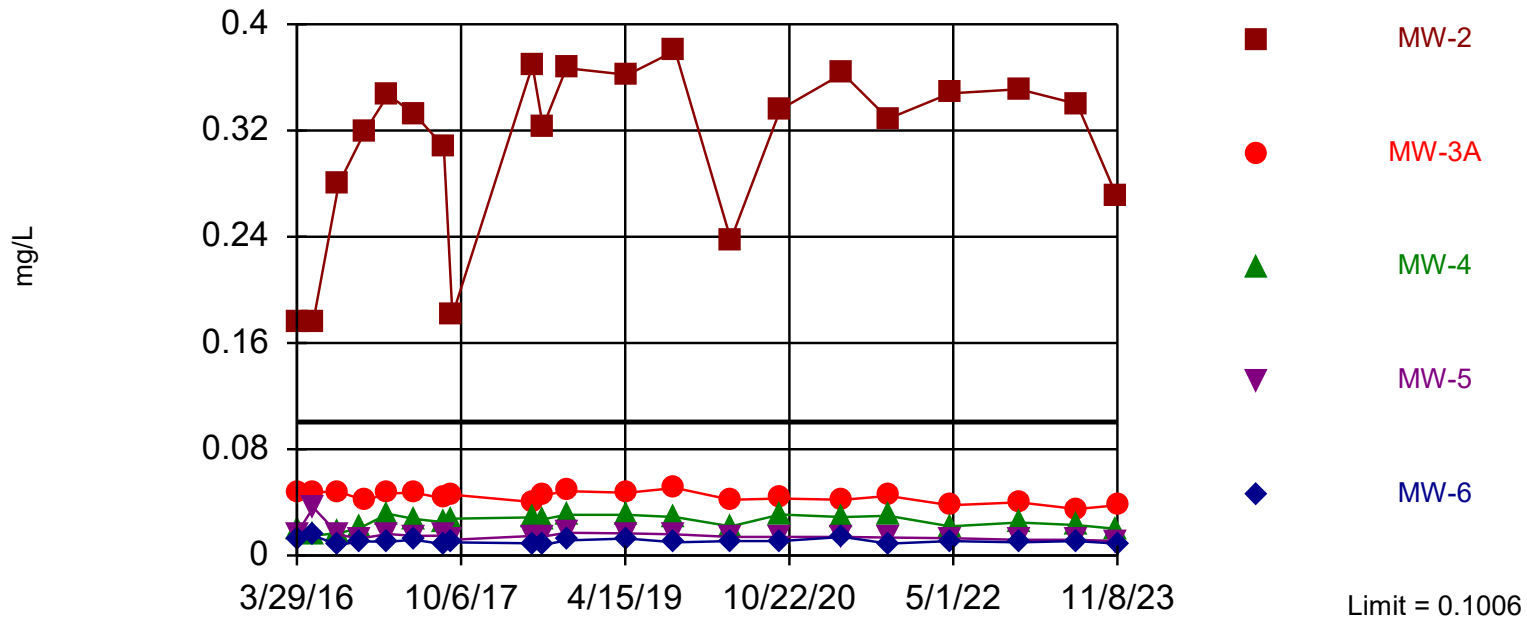
Background Data Summary (based on natural log transformation): Mean=-7.291, Std. Dev.=0.6794, n=21, 9.524% NDs. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9213, critical = 0.908. Report alpha = 0.04901. Individual comparison 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: Arsenic Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### Prediction Limit Interwell Parametric



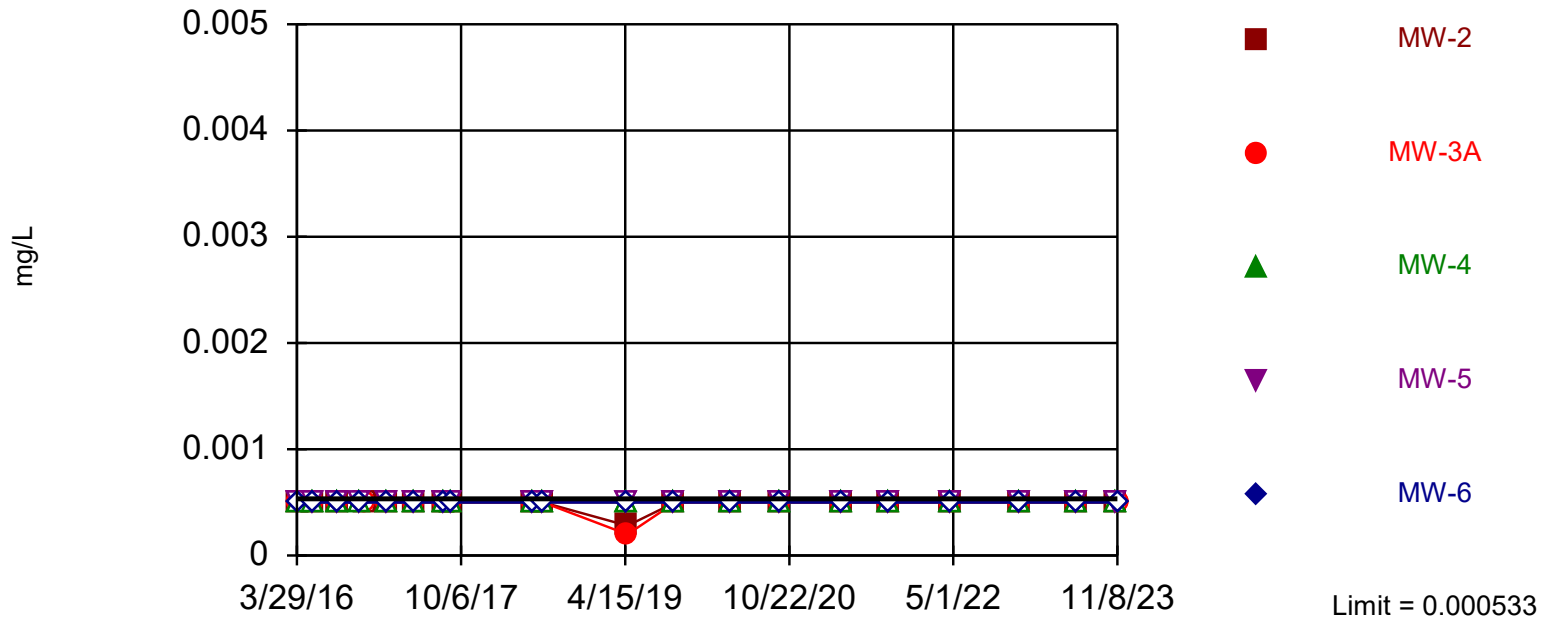
Background Data Summary: Mean=0.08114, Std. Dev.=0.007521, n=21. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9646, critical = 0.908. Report alpha = 0.04901. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 20 background values. 95% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. 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.

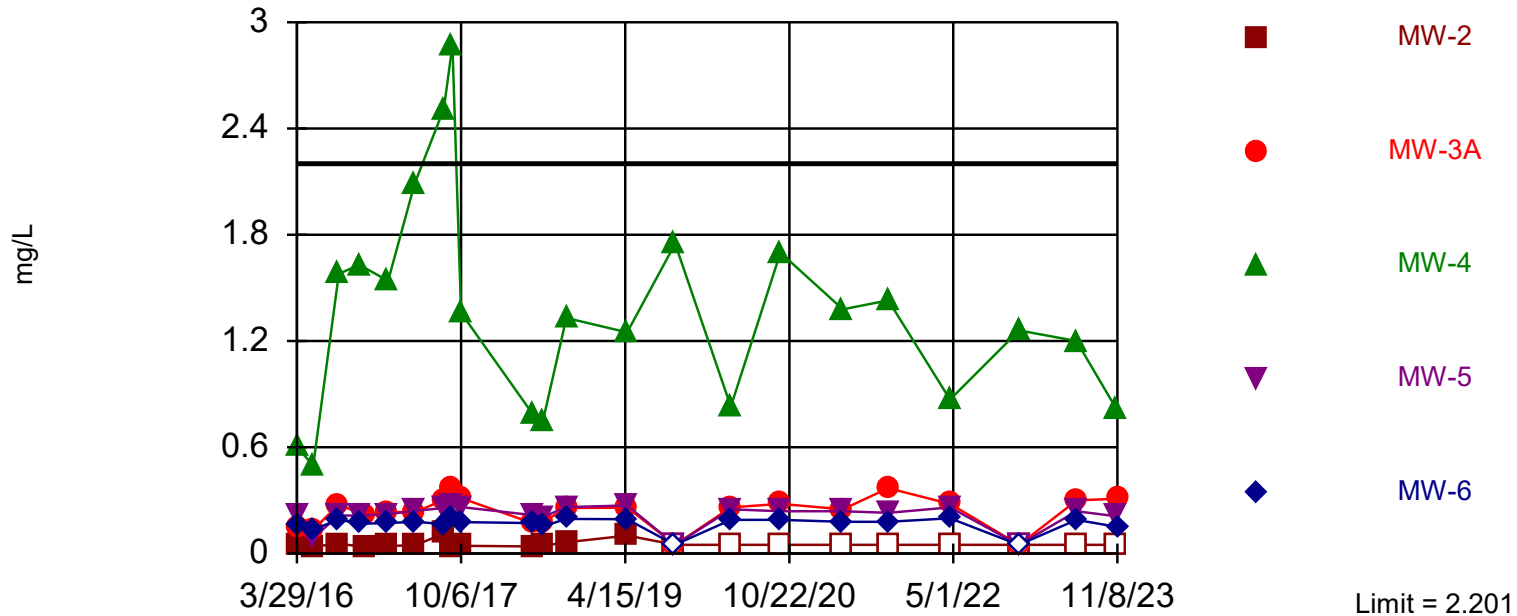
Constituent: Beryllium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.737, Std. Dev.=0.1802, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9194, critical = 0.911. Report alpha = 0.04901. 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.

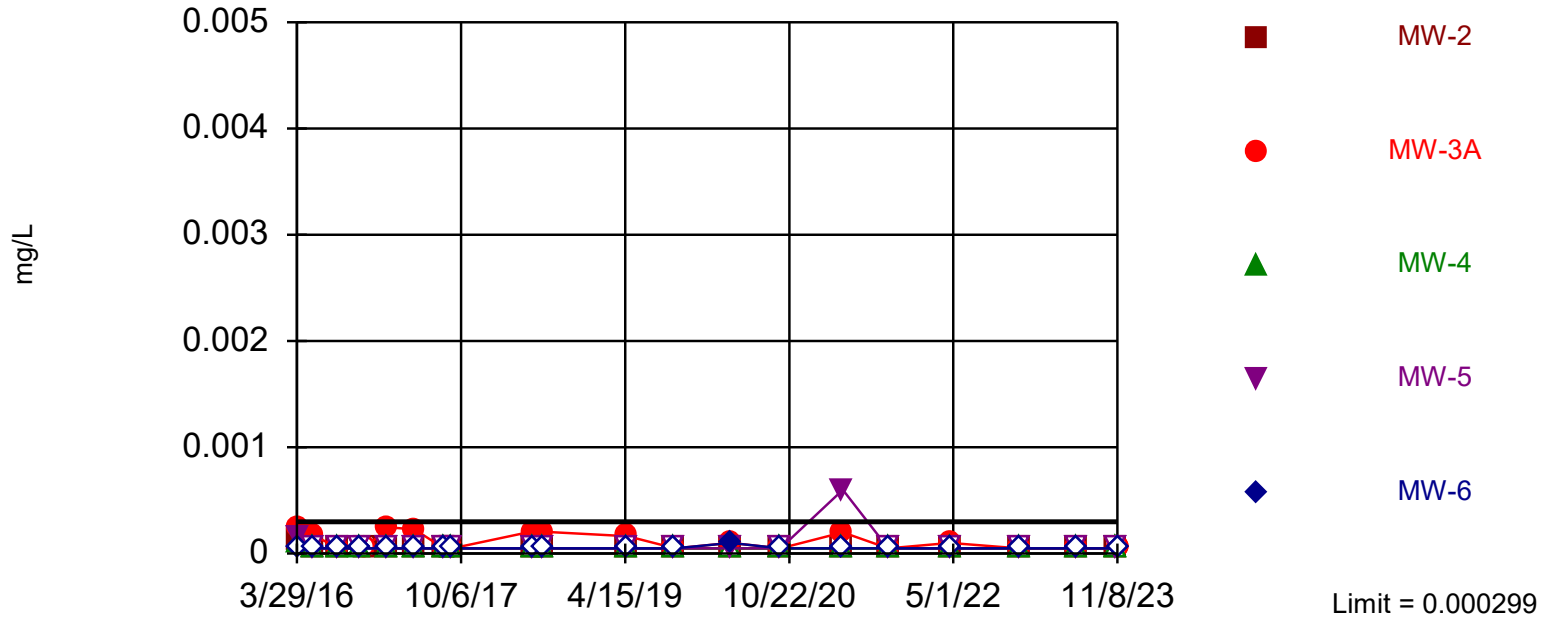
Constituent: Boron Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 20 background values. 90% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. 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.

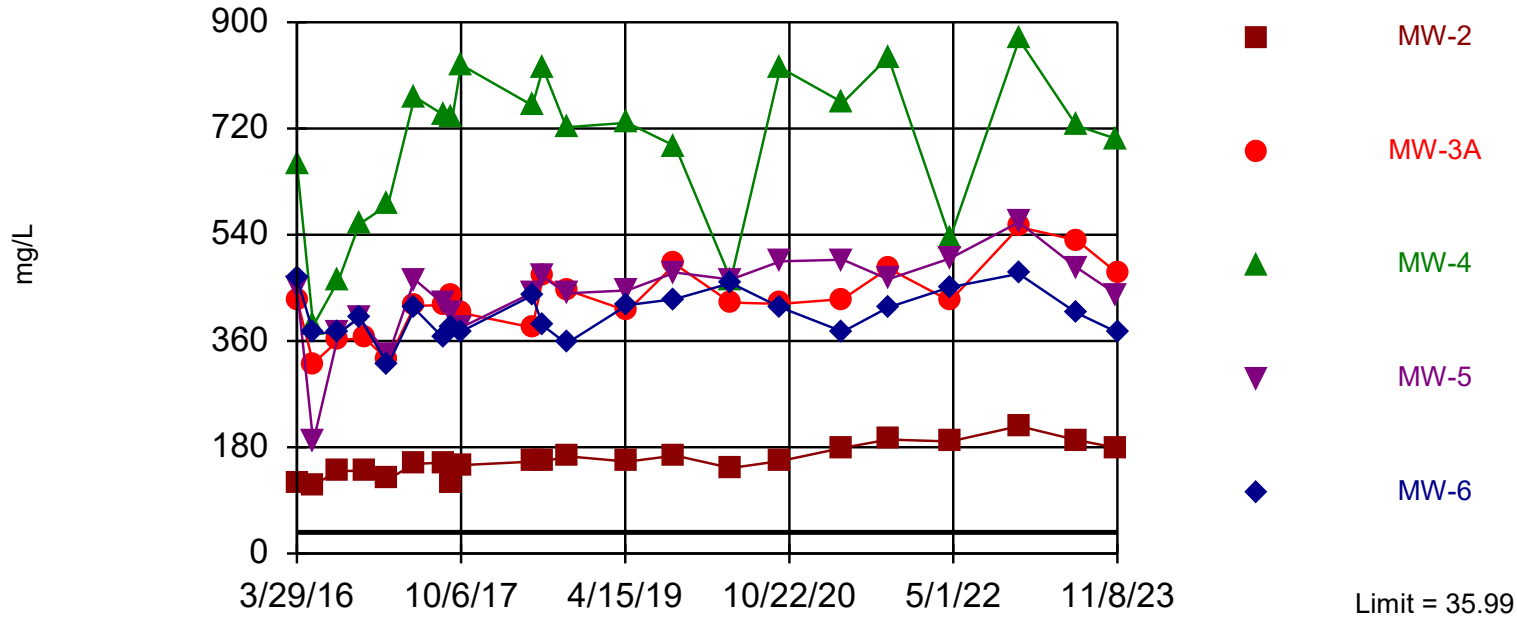
Constituent: Cadmium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data



Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

### Prediction Limit Interwell Parametric



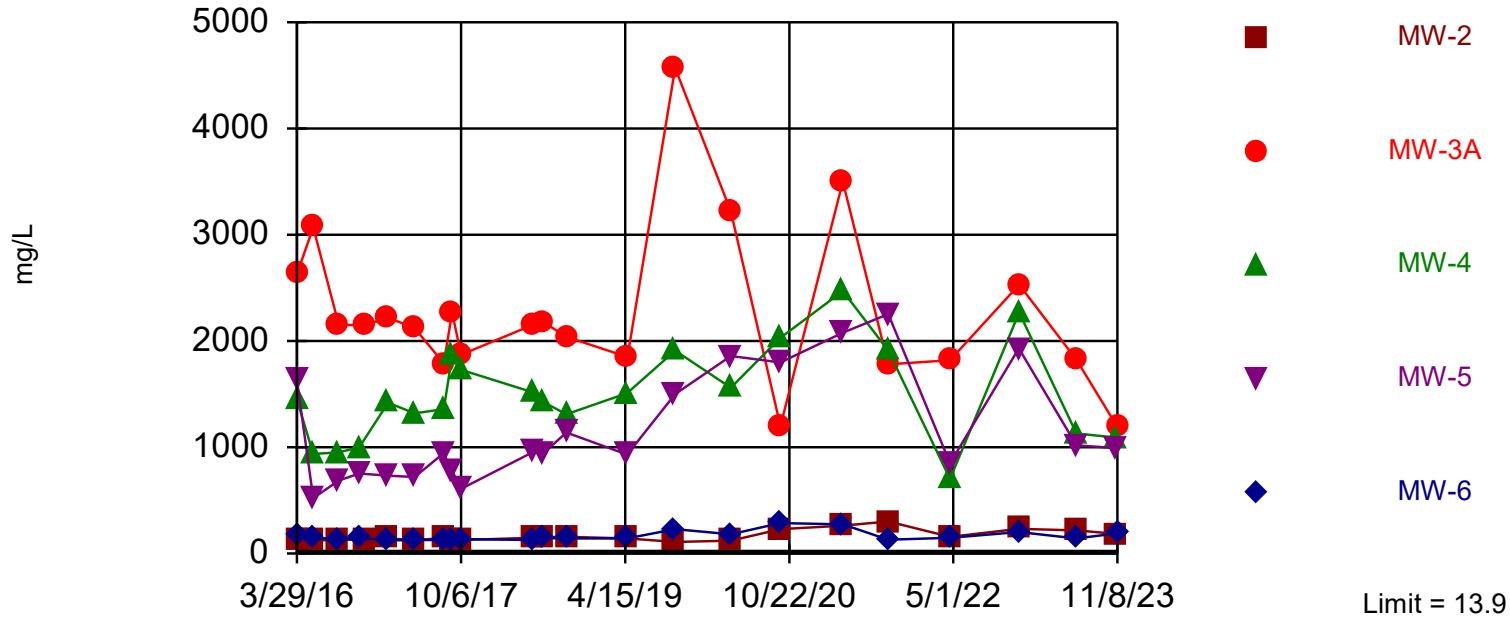
Background Data Summary: Mean=28.71, Std. Dev.=2.827, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.941, critical = 0.911. Report alpha = 0.04901. Individual comparison alpha = 0.01. Most recent point for each compliance well compared to limit. EPA 1989 outlier screening was performed on the background data. At least one background value was a statistical outlier but was below the user-set cutoff of 3 times the median. No background outliers were found.

Constituent: Calcium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

### 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 22 background values. Report alpha = 0.1852. Individual comparison alpha = 0.04013. 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.

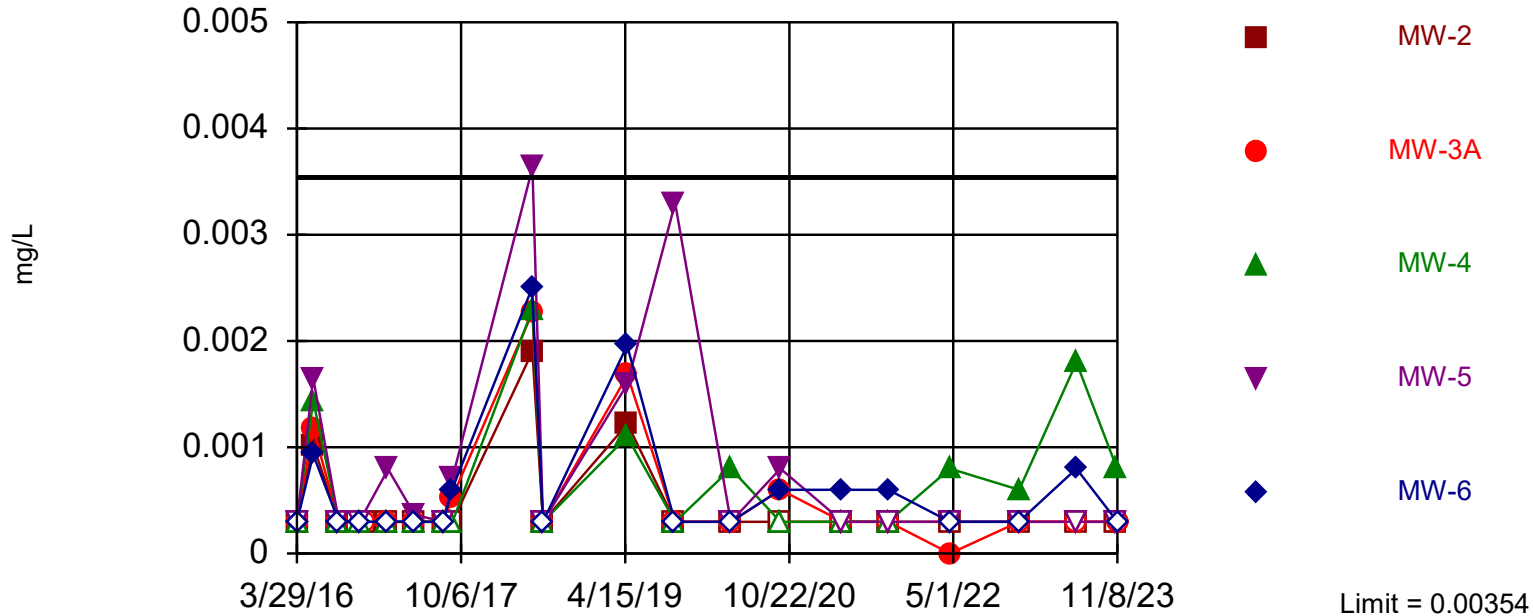
Constituent: Chloride Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 20 background values. 75% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. 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.

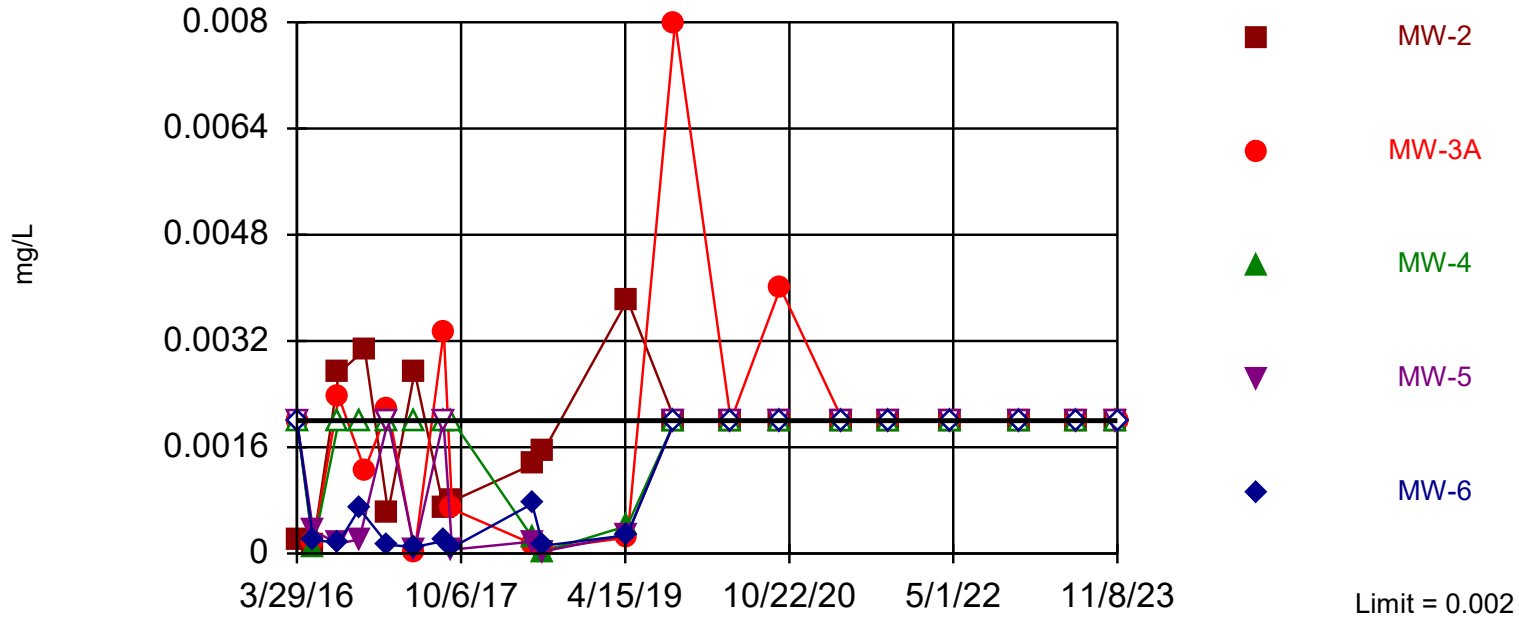
Constituent: Chromium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



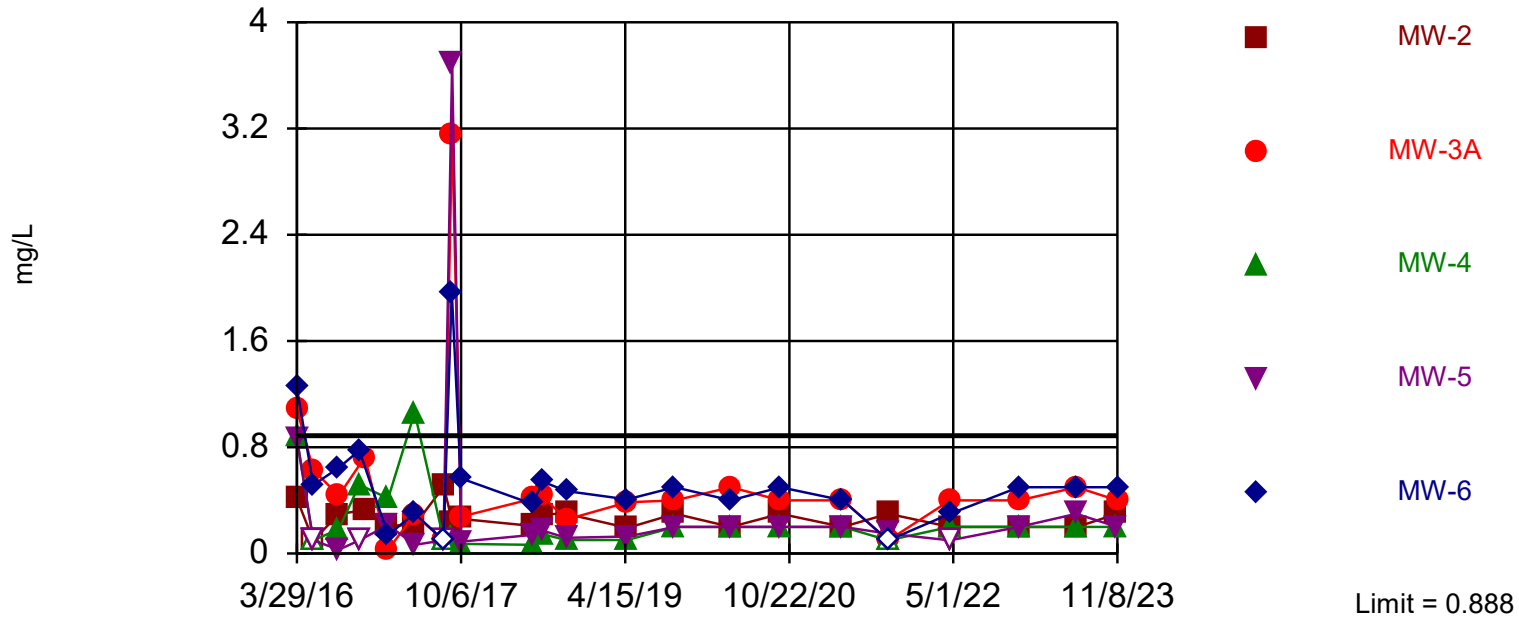
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 20 background values. 45% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance 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 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit Interwell Non-parametric



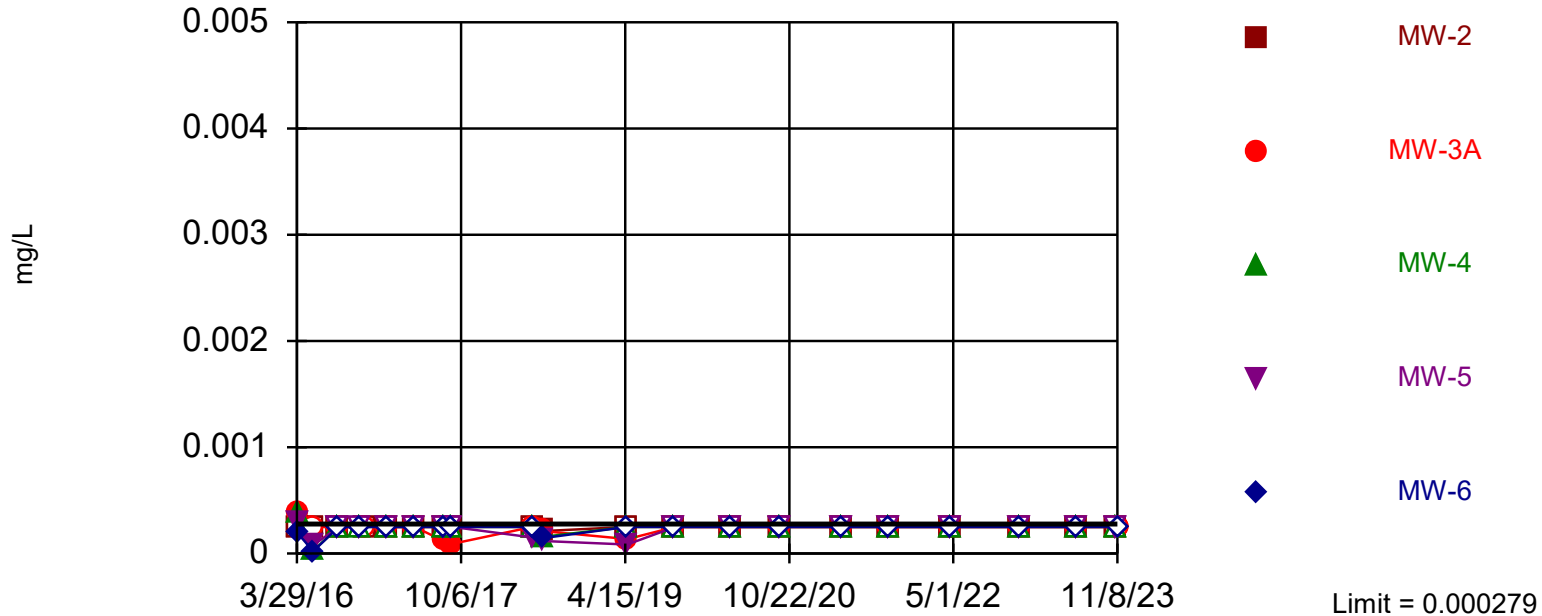
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 22 background values. Report alpha = 0.1852. Individual comparison alpha = 0.04013. Most recent point for each compliance 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 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit Interwell Non-parametric



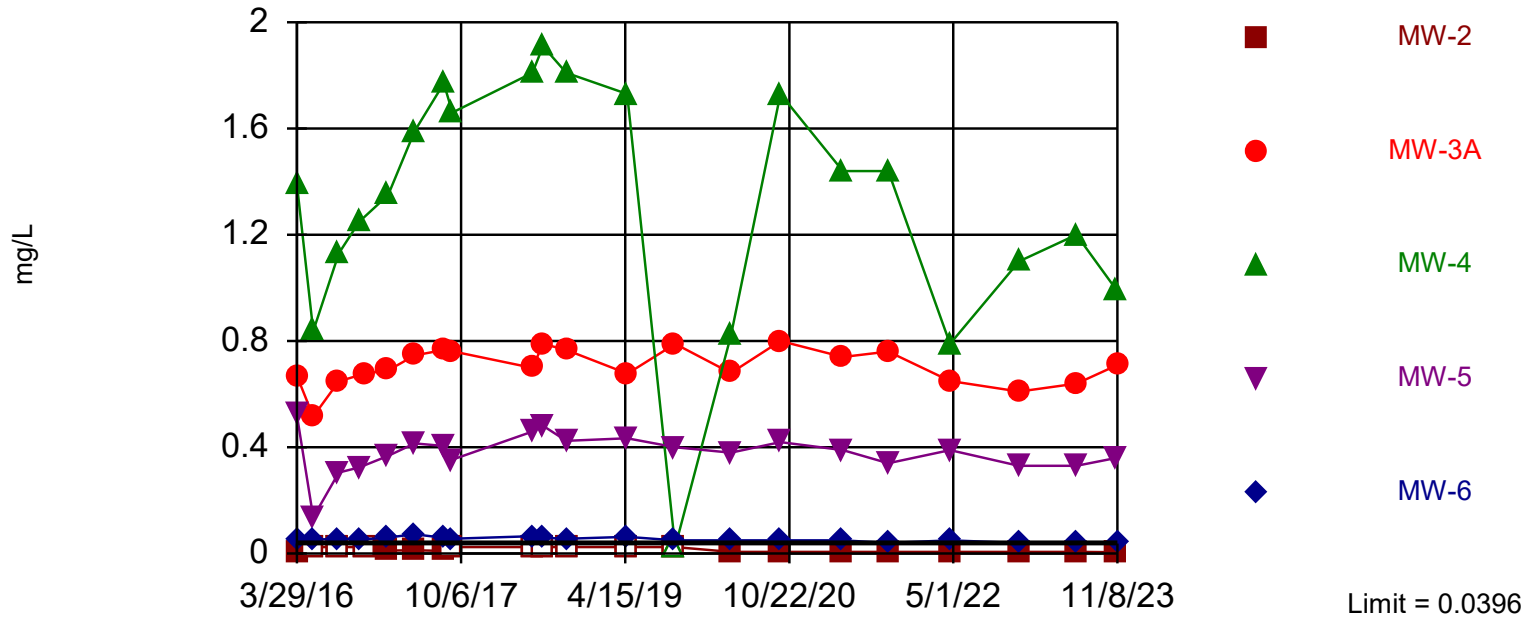
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 70% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance well compared to limit. After outlier removal distribution was non-normal, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

Constituent: Lead Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-3A, MW-4, MW-5, MW-6

### 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 21 background values. 9.524% NDs. Report alpha = 0.1923. Individual comparison alpha = 0.04182. 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.

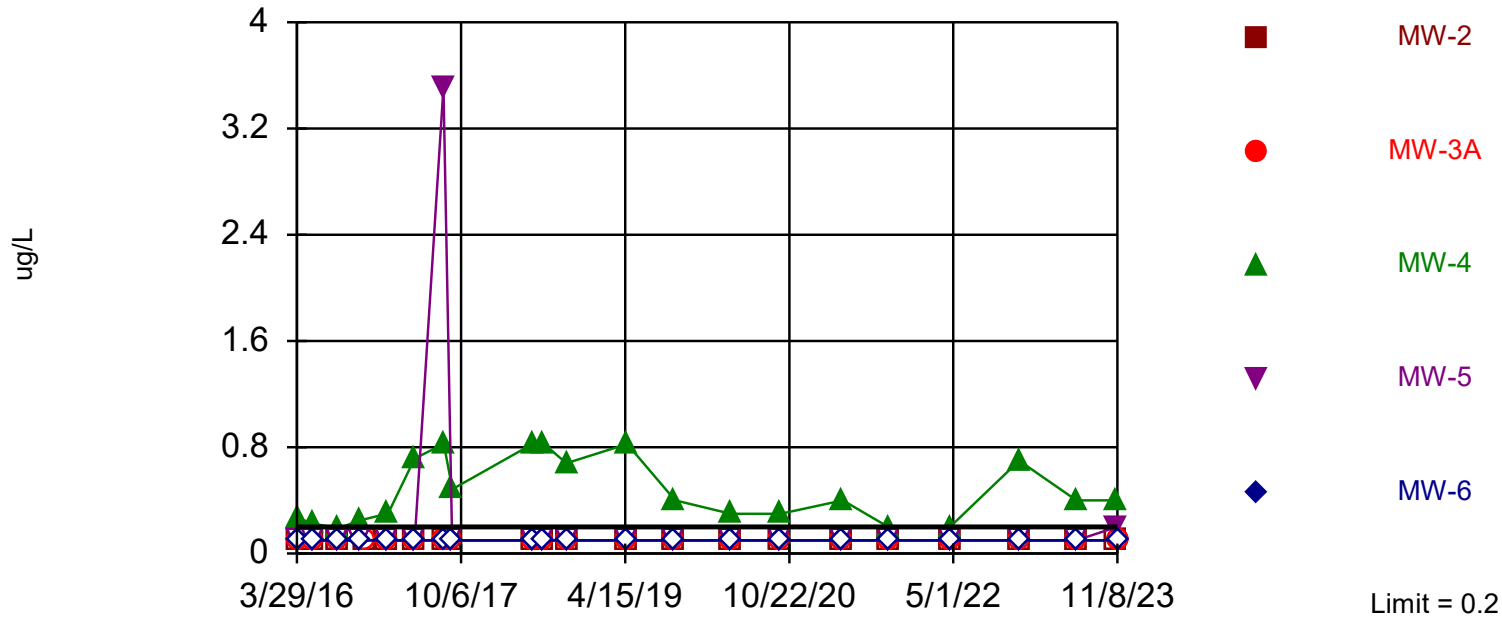
Constituent: Lithium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data



Exceeds Limit: MW-4

### Prediction Limit Interwell Non-parametric



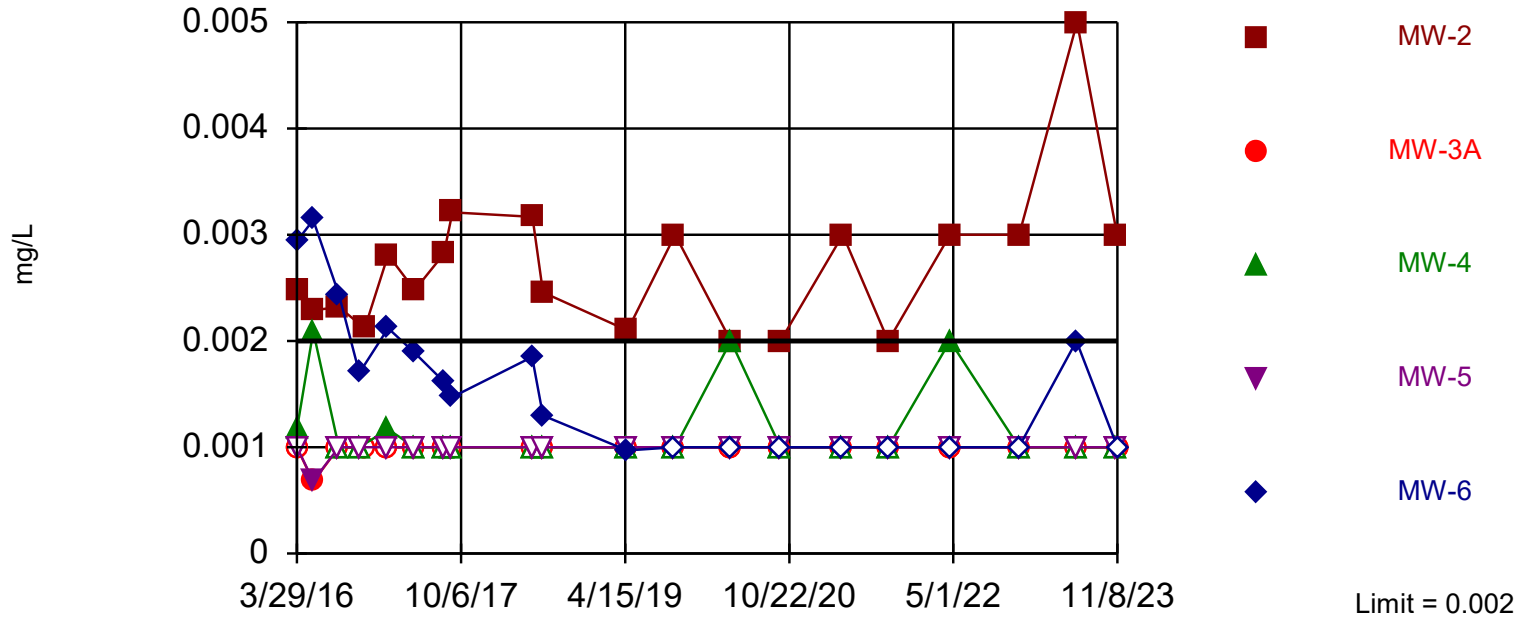
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 21 background values. 95.24% NDs. Report alpha = 0.1923. Individual comparison alpha = 0.04182. Most recent point for each compliance well compared to limit. Distribution was found 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 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2

### Prediction Limit Interwell Non-parametric



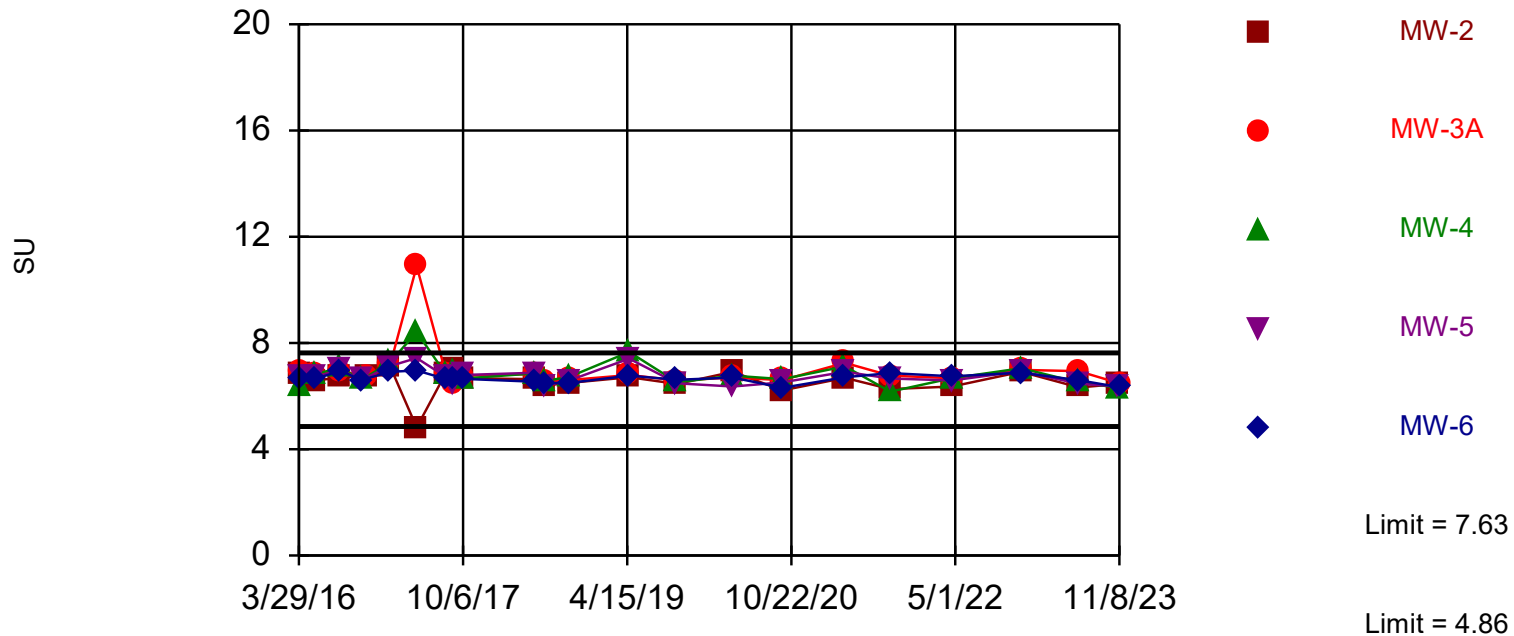
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Limit is highest of 20 background values. 50% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance 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 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

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 22 background values. Report alpha = 0.3704. Individual comparison alpha = 0.08026. 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.

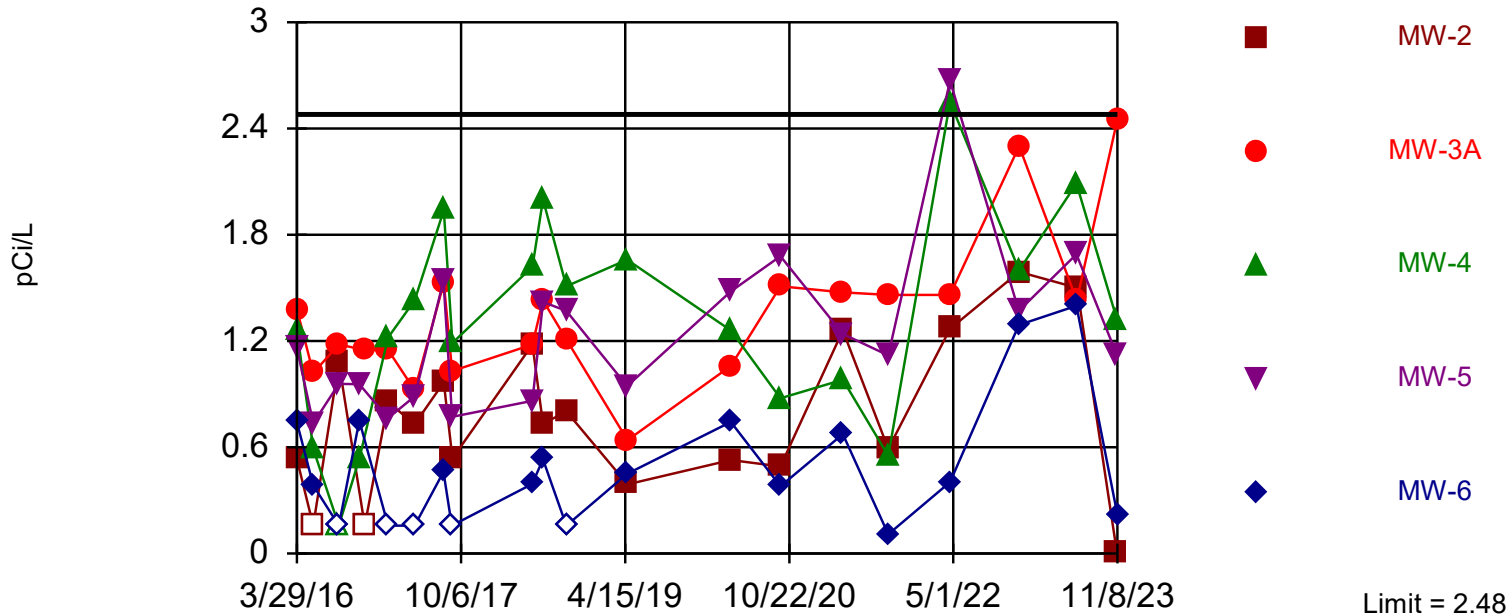
Constituent: pH [Field] Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on square root transformation): Mean=0.9615, Std. Dev.=0.2343, n=19. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9105, critical = 0.901. Report alpha = 0.04901. 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. One background outlier was removed: 0.176 (11/7/2023).

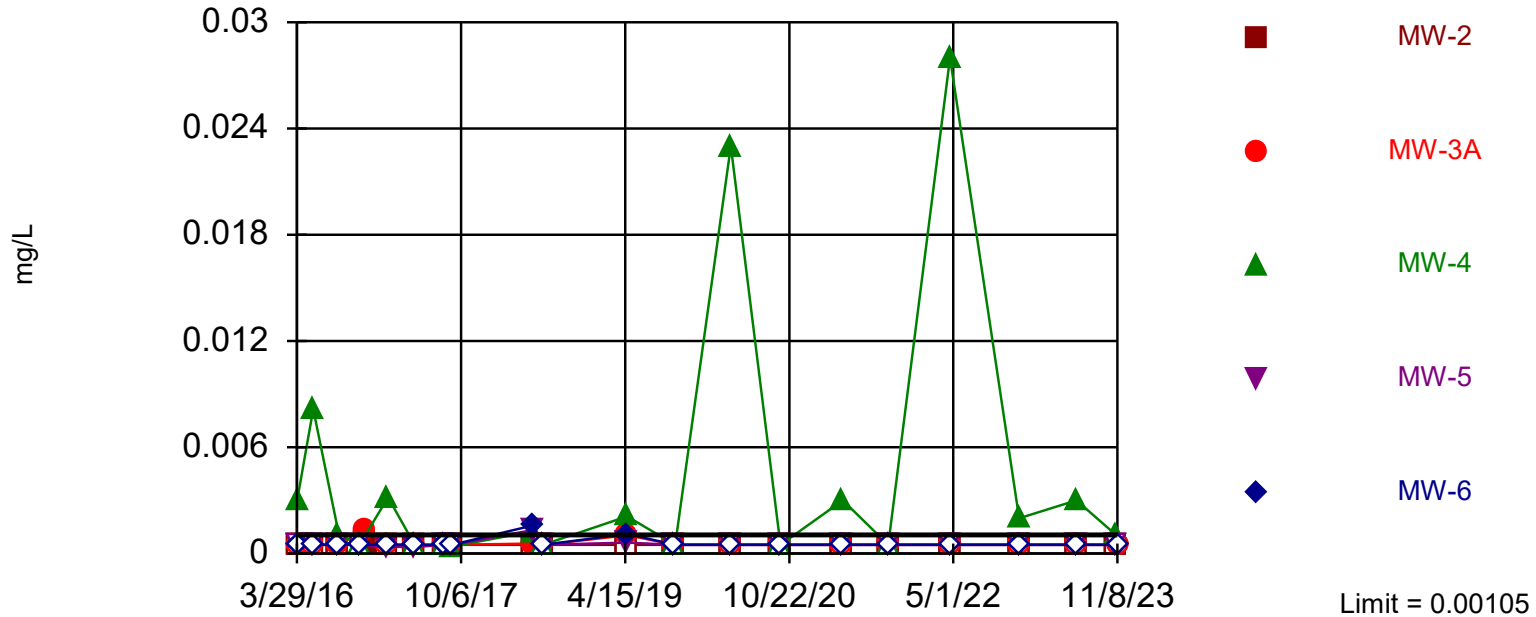
Constituent: Radium 226 + 228 Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Within Limit

### Prediction Limit

Interwell Non-parametric



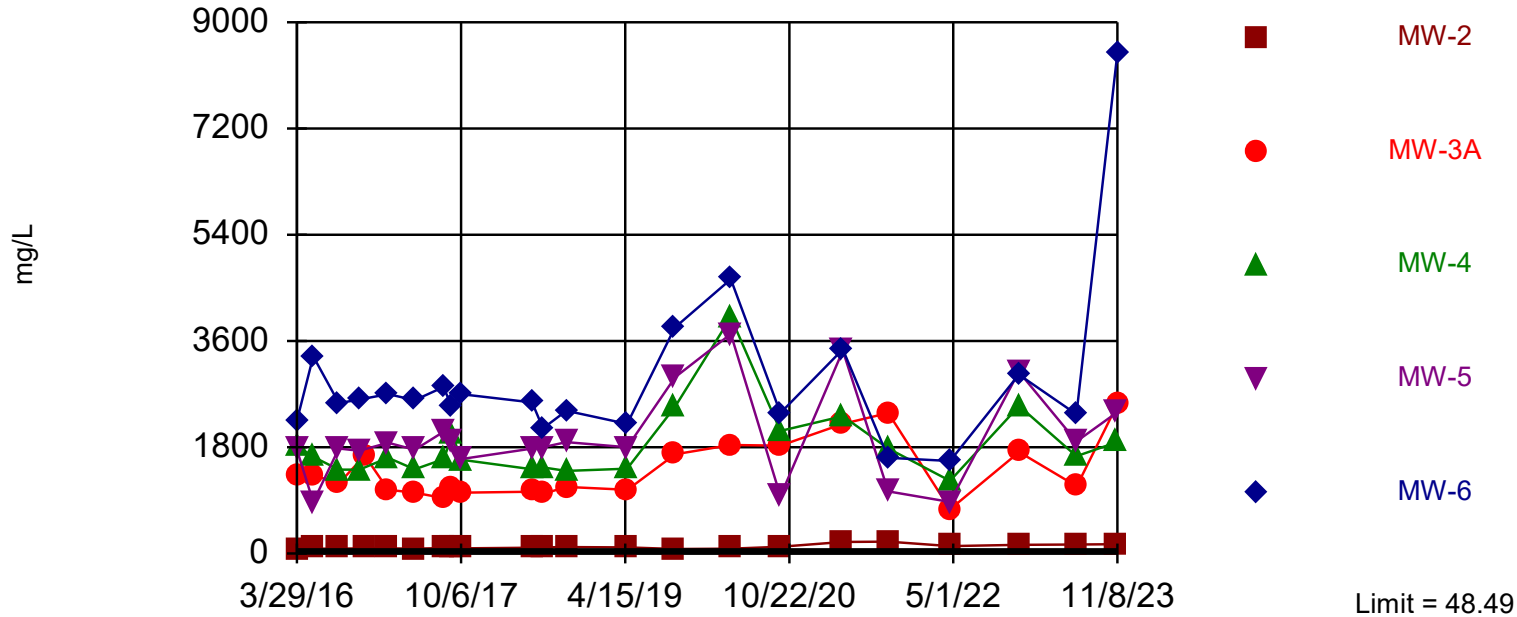
Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 20 background values. 90% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. Most recent point for each compliance well compared to limit. Distribution was found to be 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: Selenium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit  
Interwell Parametric

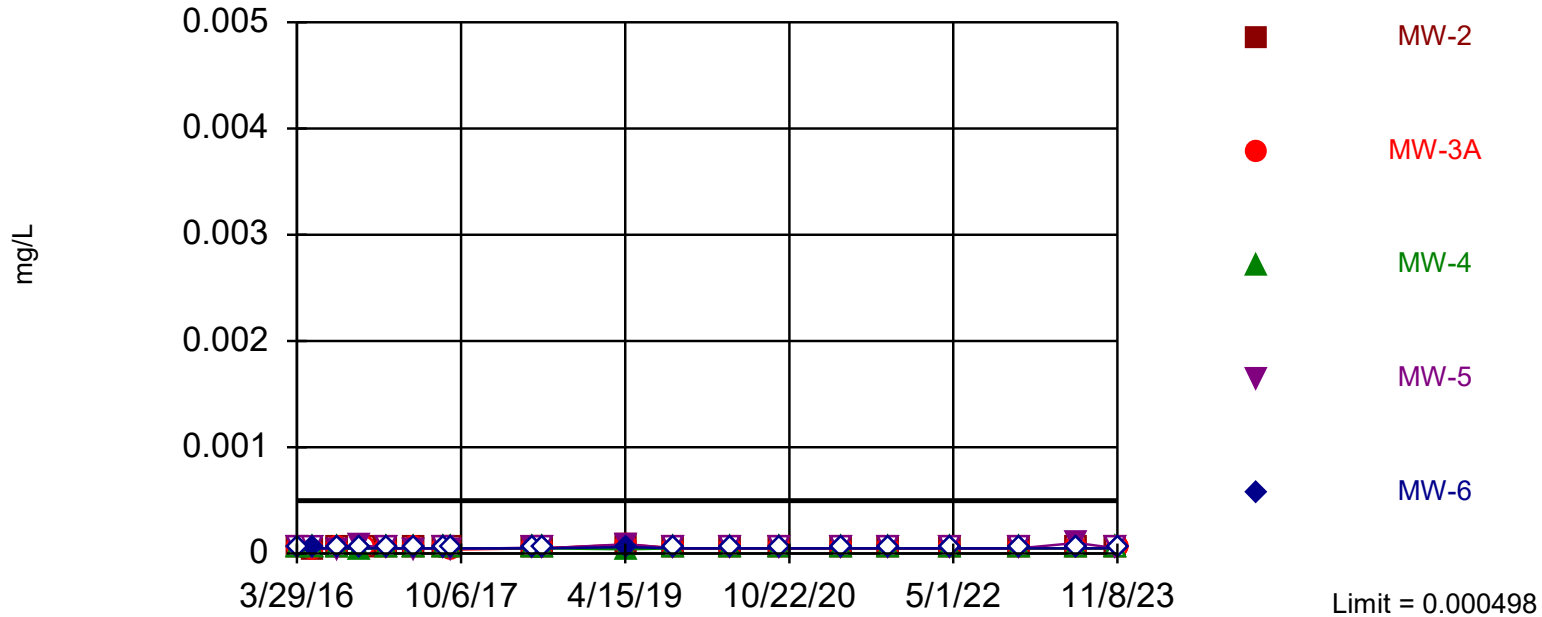


Background Data Summary (based on natural log transformation): Mean=3.289, Std. Dev.=0.2303, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9265, critical = 0.911. Report alpha = 0.04901. Individual comparison alpha = 0.01. 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: Sulfate Analysis Run 1/8/2024 7:39 AM  
Big Rivers Electric Corp. Data: Green LF All Data

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 20 background values. 65% NDs. Report alpha = 0.2. Individual comparison alpha = 0.04365. 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.

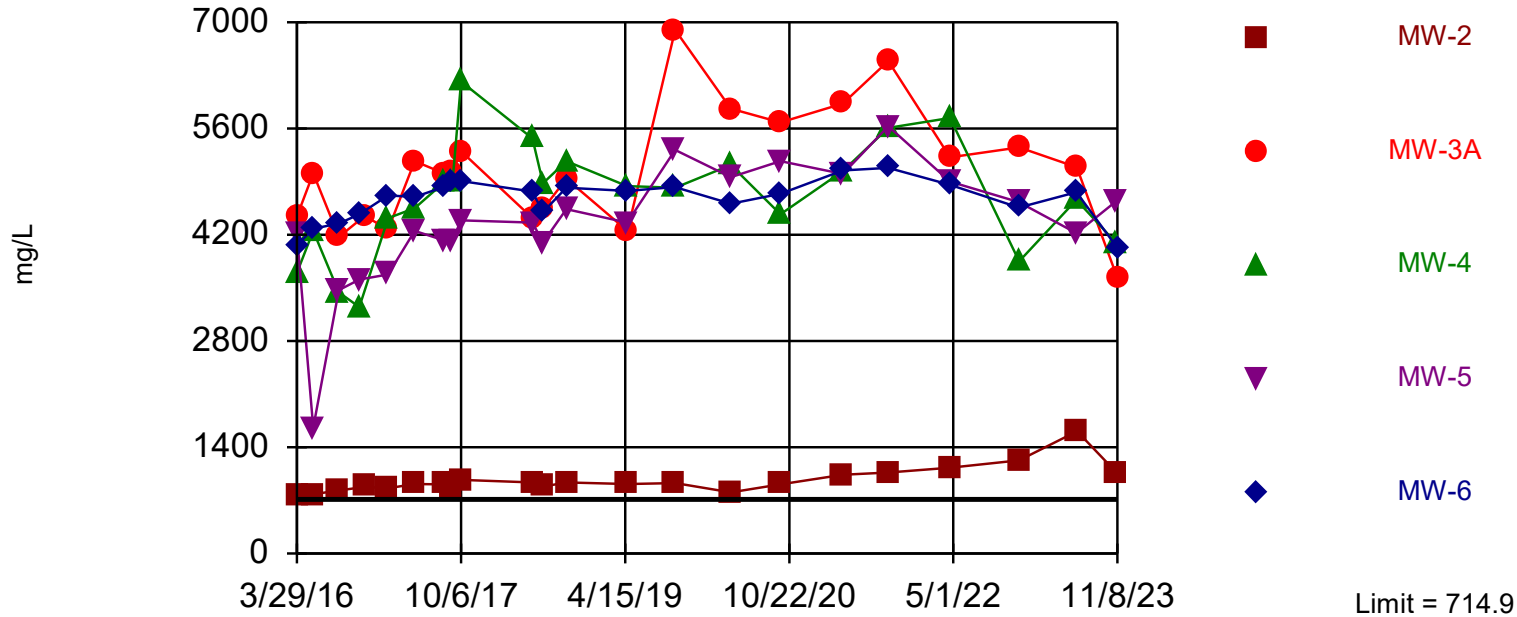
Constituent: Thallium Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data



Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

### Prediction Limit Interwell Parametric



Background Data Summary (based on cube transformation): Mean=2.1e8, Std. Dev.=6.2e7, n=22. Insufficient data to test for seasonality; not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9314, critical = 0.911. Report alpha = 0.04901. Individual comparison alpha = 0.01. 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.

Constituent: Total Dissolved Solids Analysis Run 1/8/2024 7:39 AM

Big Rivers Electric Corp. Data: Green LF All Data

# Confidence Interval

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 7:48 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic (mg/L)	MW-1 (bg)	0.0009465	0.000557	0.01	No	21	9.524	x^(1/3)	0.05	Param.
<b>Arsenic (mg/L)</b>	<b>MW-2</b>	<b>0.02585</b>	<b>0.01518</b>	<b>0.01</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Arsenic (mg/L)	MW-3A	0.000569	0.0002	0.01	No	21	47.62	No	0.05	NP (normality)
Arsenic (mg/L)	MW-4	0.000445	0.0002	0.01	No	21	52.38	No	0.05	NP (NDs)
Arsenic (mg/L)	MW-5	0.000356	0.0002	0.01	No	21	47.62	No	0.05	NP (normality)
Arsenic (mg/L)	MW-6	0.000467	0.0002	0.01	No	21	47.62	No	0.05	NP (normality)
Barium (mg/L)	MW-1 (bg)	0.08397	0.07831	2	No	21	0	No	0.05	Param.
Barium (mg/L)	MW-2	0.3364	0.2936	2	No	21	0	x^2	0.05	Param.
Barium (mg/L)	MW-3A	0.04559	0.04243	2	No	21	0	No	0.05	Param.
Barium (mg/L)	MW-4	0.02718	0.02344	2	No	21	0	No	0.05	Param.
Barium (mg/L)	MW-5	0.0158	0.0135	2	No	21	0	No	0.05	NP (normality)
Barium (mg/L)	MW-6	0.0114	0.009999	2	No	21	0	No	0.05	Param.
Lithium (mg/L)	MW-1 (bg)	0.03144	0.02921	0.04	No	21	9.524	sqrt(x)	0.05	Param.
Lithium (mg/L)	MW-2	0.025	0.007	0.04	No	21	42.86	No	0.05	NP (normality)
<b>Lithium (mg/L)</b>	<b>MW-3A</b>	<b>0.7306</b>	<b>0.6776</b>	<b>0.04</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-4</b>	<b>1.496</b>	<b>1.149</b>	<b>0.04</b>	<b>Yes</b>	<b>21</b>	<b>4.762</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-5</b>	<b>0.4087</b>	<b>0.3501</b>	<b>0.04</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
<b>Lithium (mg/L)</b>	<b>MW-6</b>	<b>0.05609</b>	<b>0.04951</b>	<b>0.04</b>	<b>Yes</b>	<b>21</b>	<b>0</b>	<b>No</b>	<b>0.05</b>	<b>Param.</b>
Mercury (ug/L)	MW-1 (bg)	0.1	0.1	2	No	21	95.24	No	0.05	NP (NDs)
Mercury (ug/L)	MW-2	0.1	0.1	2	No	21	100	No	0.05	NP (NDs)
Mercury (ug/L)	MW-3A	0.1	0.1	2	No	21	100	No	0.05	NP (NDs)
Mercury (ug/L)	MW-4	0.5247	0.3522	2	No	21	0	sqrt(x)	0.05	Param.
Mercury (ug/L)	MW-5	0.2	0.1	2	No	21	90.48	No	0.05	NP (NDs)
Mercury (ug/L)	MW-6	0.1	0.1	2	No	21	100	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-1 (bg)	0.00133	0.001	0.1	No	20	50	No	0.05	NP (normality)
Molybdenum (mg/L)	MW-2	0.002884	0.002426	0.1	No	20	0	ln(x)	0.05	Param.
Molybdenum (mg/L)	MW-3A	0.001	0.001	0.1	No	20	95	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-4	0.00117	0.001	0.1	No	20	75	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-5	0.001	0.001	0.1	No	20	95	No	0.05	NP (NDs)
Molybdenum (mg/L)	MW-6	0.00189	0.001	0.1	No	20	40	No	0.05	NP (normality)

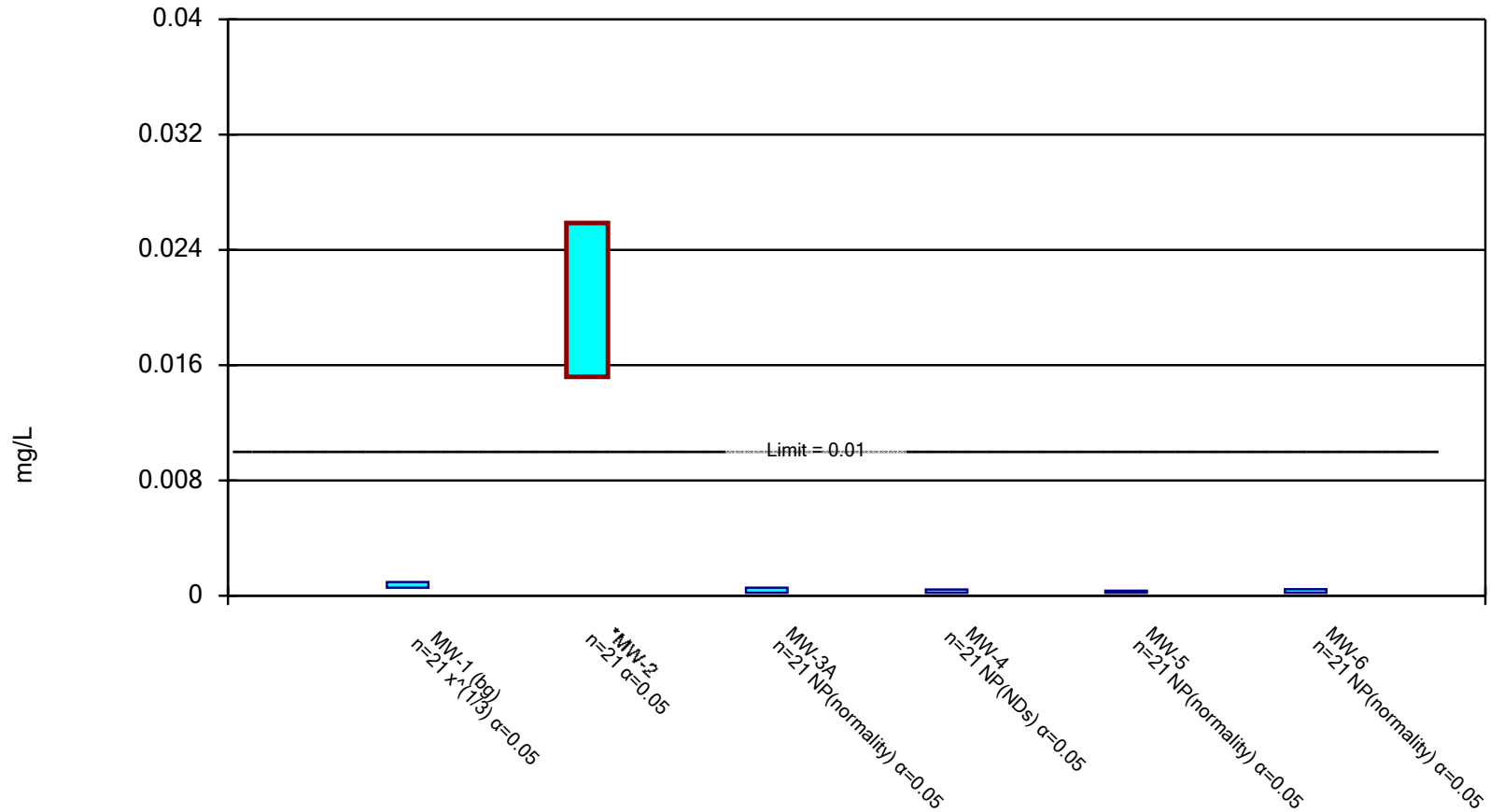
# Confidence Interval

Big Rivers Electric Corp. Data: Green LF All Data Printed 1/8/2024, 7:48 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Arsenic (mg/L)	MW-2	0.02585	0.01518	0.01	Yes	21	0	No	0.05	Param.
Lithium (mg/L)	MW-3A	0.7306	0.6776	0.04	Yes	21	0	No	0.05	Param.
Lithium (mg/L)	MW-4	1.496	1.149	0.04	Yes	21	4.762	No	0.05	Param.
Lithium (mg/L)	MW-5	0.4087	0.3501	0.04	Yes	21	0	No	0.05	Param.
Lithium (mg/L)	MW-6	0.05609	0.04951	0.04	Yes	21	0	No	0.05	Param.

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.\* Normality Test: Shapiro Wilk, alpha based on n.

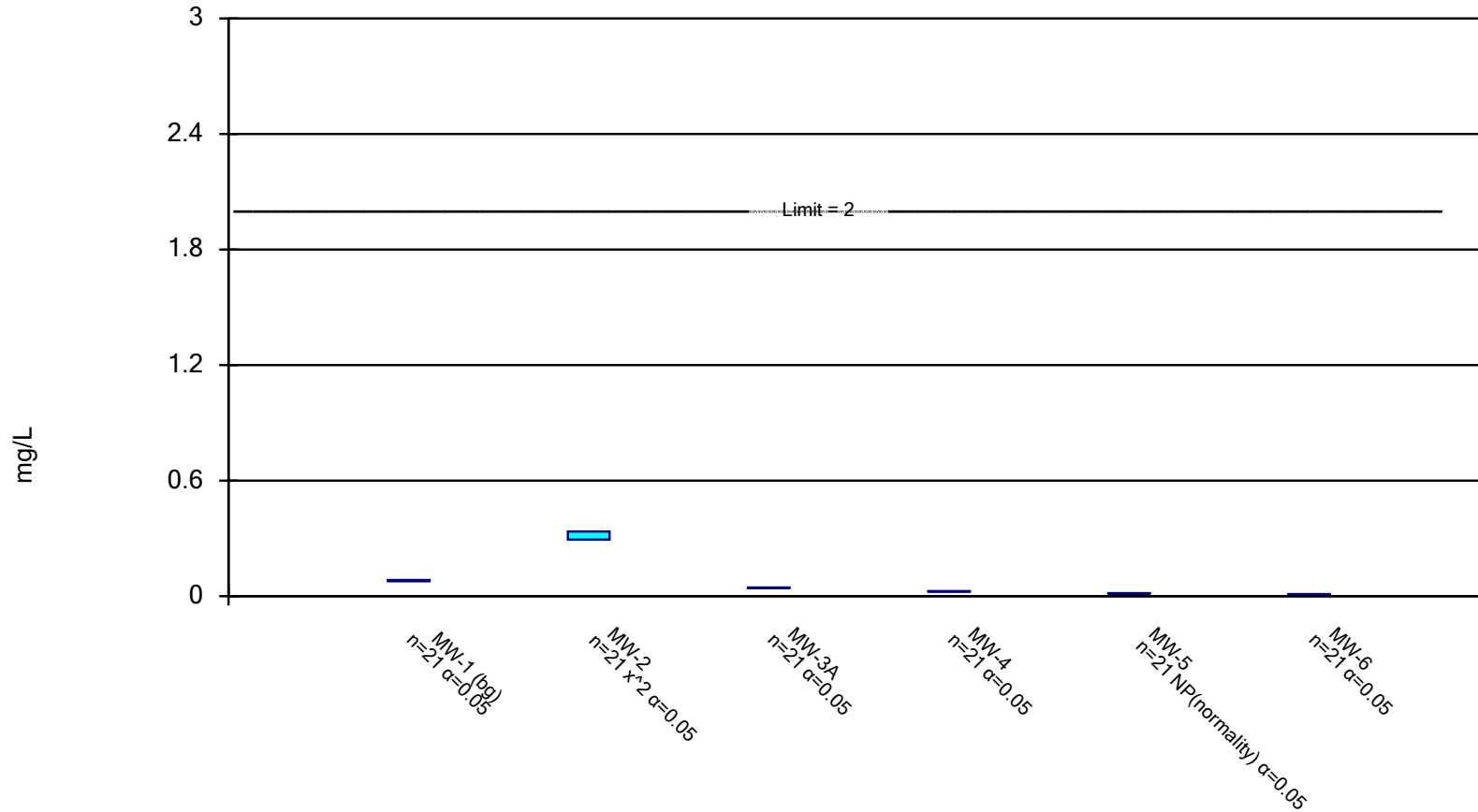


Constituent: Arsenic Analysis Run 1/8/2024 7:47 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.

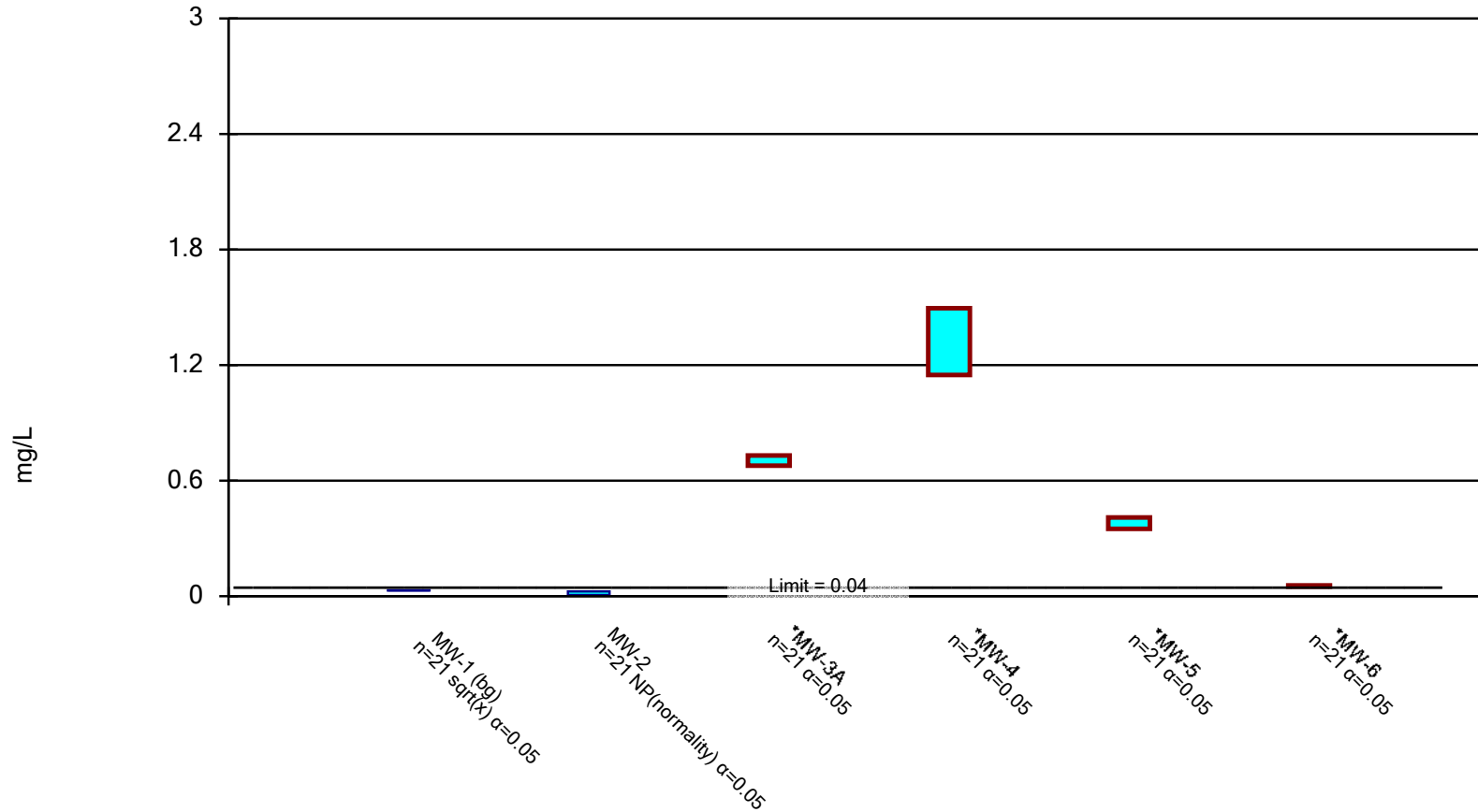


Constituent: Barium Analysis Run 1/8/2024 7:47 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.\* Normality Test: Shapiro Wilk, alpha based on n.

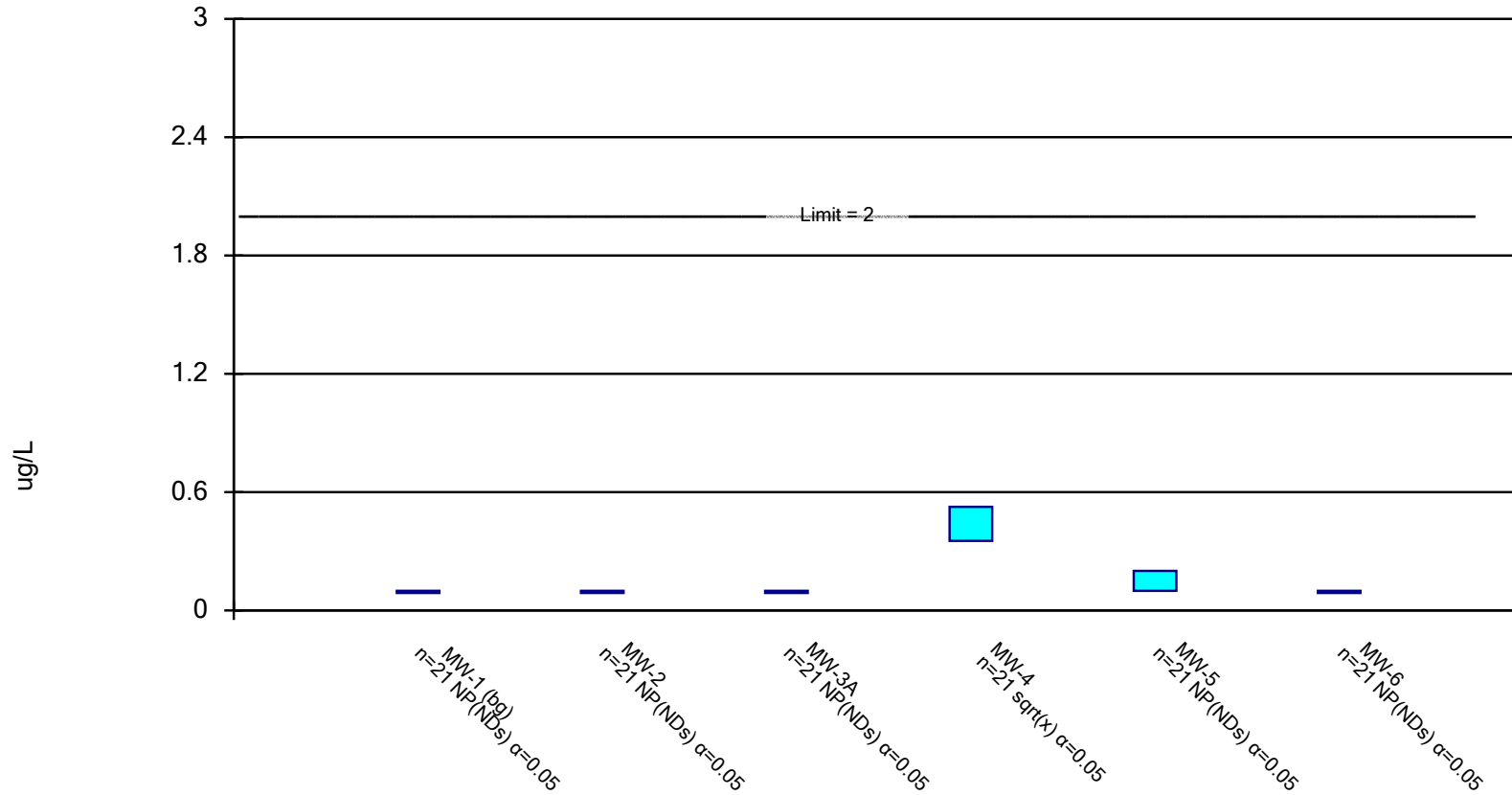


Constituent: Lithium Analysis Run 1/8/2024 7:47 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.

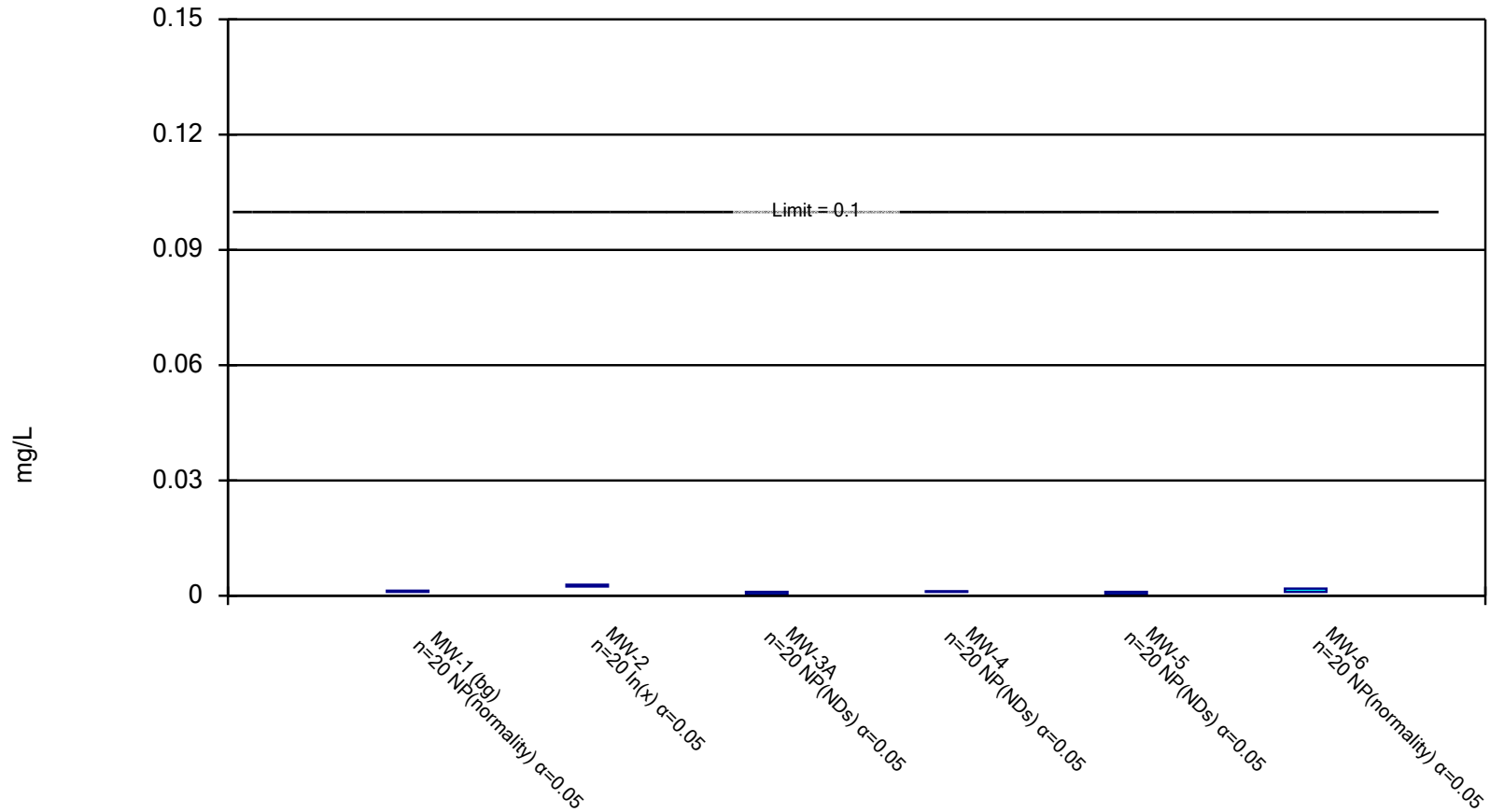


Constituent: Mercury Analysis Run 1/8/2024 7:47 AM

Big Rivers Electric Corp. Data: Green LF All Data

## Parametric and Non-Parametric (NP) Confidence Interval


Compliance Limit is not exceeded. Normality Test: Shapiro Wilk, alpha based on n.




Constituent: Molybdenum Analysis Run 1/8/2024 7:47 AM

Big Rivers Electric Corp. Data: Green LF All Data





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**APPENDIX K - GREEN SURFACE IMPOUNDMENT  
STATISTICAL EVALUATIONS**

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November 3, 2023

Mr. Mark Bertram  
Big Rivers Electric Corporation  
8000 Highway 2096  
Robards, KY 42452

Re: Statistical Evaluation of June 2023 Detection Monitoring Groundwater Data  
Sebree Generating Station Green Surface Impoundment in Robards, Kentucky  
Agency Interest ID #: 4196

Dear Mr. Bertram:

This letter presents the results of the statistical evaluation of analytical data from the June 2023 detection monitoring event at the Sebree Generating Station's Green Surface Impoundment in Webster County, Robards, 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)*. No historical statistically significant increases (SSIs) are on record for this CCR Unit under the detection monitoring program, and therefore, the establishment of calculated groundwater protection standards were not required as a part of the statistical evaluation completed for previous sampling events. The statistical evaluation presented herein for the June 2023 sampling event was performed in accordance with the *Groundwater Monitoring System and Statistical Methods* document prepared by Associated Engineers, Inc. and dated June 28, 2016.

In June 2023, the Green Surface Impoundment groundwater monitoring well network was sampled for Appendix III parameters per the requirements of 40 CFR §257.94(a). Interwell prediction limit statistical analyses were performed for these well/constituent pairs and are discussed subsequently. This letter presents the results of the statistical evaluation of the June 2023 detection monitoring event for inclusion in the Sebree Generating Station Operating Record.

### **Statistical Evaluation of Sebree Green Surface Impoundment Compliance Monitoring Well Network Evaluation**

An interwell prediction limit evaluation was performed to compare the concentrations of the Appendix III parameters observed in June 2023 compliance (downgradient) monitoring wells MW-12, MW-13, and MW-14 to calculated prediction limits (i.e., background limits) that were established using data collected from April of 2016 through June of 2023 from upgradient monitoring well MW-1AG1. A comparison of the June 2023 data to the updated background limits is presented on Table 1. No Appendix III parameters were detected from downgradient compliance wells in June 2023 at concentrations above the calculated background limits (equivalent to the MW-11 prediction limits), and a summary of the statistical evaluation is included in Attachment 1.

Mr. Mark Bertram  
Big Rivers Electric Corporation  
November 3, 2023  
Page 2

Given that none of the Appendix III constituents exhibited concentrations above their respective calculated background limit (i.e., no SSIs identified) at the Green Surface Impoundment groundwater monitoring network, further statistical evaluation was not required and the CCR unit will continue detection monitoring per the requirements of 40 CFR §257.94 for the next 2023 sampling event.

Sincerely,

Burns & McDonnell Engineering Company, Inc.



Chris Hoglund, PG  
Project Manager

Attachments:

Table 1 – June 2023 Groundwater Analytical Summary

Attachment 1 – Sanitas™ Statistical Outputs

cc: Hunter Mizell, BREC Sebree Station

**TABLE**

**TABLE 1**  
**June 2023 Groundwater Analytical Summary**  
 Green CCR Surface Impoundment  
 Sebree Generating Station

APPENDIX III CONSTITUENTS	2023 Calculated Background <sup>1</sup>	Units	MW-11	MW-12	MW-13	MW-14	
			6/25/2023	6/25/2023	6/25/2023	6/25/2023	
			Upgradient Well	Downgradient Compliance Wells			
			Detection Monitoring				
Boron	0.9765	mg/L	0.57	0.31	0.10 U	0.10 U	
Calcium	397.6	mg/L	131 D1	94.3 D1	94 D2	0.13 U	
Chloride	4039	mg/L	1790 D	9.5	21	107	
Fluoride	0.891	mg/L	0.2	0.4	0.2	0.3	
pH (Field Measurement)	6.363 - 7.571	SU	6.87	6.9	6.65	6.69	
Sulfate	2043	mg/L	568 D	4	77	184	
Total Dissolved Solids	5130	mg/L	2960	608	656	992	

**Notes:**

1. Background values calculated from upgradient MW-11 data from April 2016 through June 2023.

D = Results reported from dilution

D1 = Sample required dilution due to high concentration of target analyte

D2 = Sample required dilution due to matrix interference

mg/L = milligrams per Liter

SU = Standard units

U = Nondetect


**ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS**

# Prediction Limit


Big Rivers Electric Corp. Client: Burns & McDonnell Data: Green SI All Data Printed 8/25/2023, 8:56 AM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-12	0.9765	n/a	6/25/2023	0.31	No	20	15	x^3	0.01	Param Inter
Boron (mg/L)	MW-13	0.9765	n/a	6/25/2023	0.05ND	No	20	15	x^3	0.01	Param Inter
Boron (mg/L)	MW-14	0.9765	n/a	6/25/2023	0.05ND	No	20	15	x^3	0.01	Param Inter
Calcium (mg/L)	MW-12	397.6	n/a	6/25/2023	94.3	No	20	0	x^3	0.01	Param Inter
Calcium (mg/L)	MW-13	397.6	n/a	6/25/2023	94	No	20	0	x^3	0.01	Param Inter
Calcium (mg/L)	MW-14	397.6	n/a	6/25/2023	0.065ND	No	20	0	x^3	0.01	Param Inter
Chloride (mg/L)	MW-12	4039	n/a	6/25/2023	9.5	No	20	0	sqrt(x)	0.01	Param Inter
Chloride (mg/L)	MW-13	4039	n/a	6/25/2023	21	No	20	0	sqrt(x)	0.01	Param Inter
Chloride (mg/L)	MW-14	4039	n/a	6/25/2023	107	No	20	0	sqrt(x)	0.01	Param Inter
Fluoride (mg/L)	MW-12	0.891	n/a	6/25/2023	0.4	No	20	10	n/a	0.04552	NP Inter (normality)
Fluoride (mg/L)	MW-13	0.891	n/a	6/25/2023	0.2	No	20	10	n/a	0.04552	NP Inter (normality)
Fluoride (mg/L)	MW-14	0.891	n/a	6/25/2023	0.3	No	20	10	n/a	0.04552	NP Inter (normality)
pH [Field] (SU)	MW-12	7.571	6.363	6/25/2023	6.9	No	20	0	No	0.005	Param Inter
pH [Field] (SU)	MW-13	7.571	6.363	6/25/2023	6.65	No	20	0	No	0.005	Param Inter
pH [Field] (SU)	MW-14	7.571	6.363	6/25/2023	6.69	No	20	0	No	0.005	Param Inter
Sulfate (mg/L)	MW-12	2043	n/a	6/25/2023	4	No	20	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-13	2043	n/a	6/25/2023	77	No	20	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-14	2043	n/a	6/25/2023	184	No	20	0	No	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-12	5130	n/a	6/25/2023	608	No	20	0	n/a	0.04552	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-13	5130	n/a	6/25/2023	656	No	20	0	n/a	0.04552	NP Inter (normality)
Total Dissolved Solids (mg/L)	MW-14	5130	n/a	6/25/2023	992	No	20	0	n/a	0.04552	NP Inter (normality)





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January 26, 2024

Mr. Mark Bertram  
Big Rivers Electric Corporation  
8000 Highway 2096  
Robards, KY 42452

Re: Statistical Evaluation of November 2023 Detection Monitoring Groundwater Data  
Sebree Generating Station Green Surface Impoundment in Robards, Kentucky  
Agency Interest ID #: 4196

Dear Mr. Bertram:

This letter presents the results of the statistical evaluation of analytical data from the November 2023 detection monitoring event at the Sebree Generating Station's Green Surface Impoundment in Webster County, Robards, 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)*. No historical statistically significant increases (SSIs) are on record for this CCR Unit under the detection monitoring program, and therefore, the establishment of calculated groundwater protection standards were not required as a part of the statistical evaluation completed for previous sampling events. The statistical evaluation presented herein for the November 2023 sampling event was performed in accordance with the *Groundwater Monitoring System and Statistical Methods* document prepared by Associated Engineers, Inc. and dated June 28, 2016.

In November 2023, the Sebree Generating Station's Green Surface Impoundment groundwater monitoring well network was sampled for Appendix III parameters per the requirements of 40 CFR §257.94(a). Interwell prediction limit statistical analyses were performed for these well/constituent pairs and are discussed subsequently. This letter presents the results of the statistical evaluation of the November 2023 detection monitoring event for inclusion in the Sebree Generating Station Operating Record.

### **Statistical Evaluation of Sebree Generating Station's Green Surface Impoundment Compliance Monitoring Well Network Evaluation**

An interwell prediction limit evaluation was performed to compare the concentrations of the Appendix III parameters observed in November 2023 compliance (downgradient) monitoring wells MW-12, MW-13, and MW-14 to calculated prediction limits (i.e., background limits) that were established using data collected from April of 2016 through November of 2023 from upgradient monitoring well MW-11. A comparison of the November 2023 data to the updated background limits is presented on Table 1. No Appendix III parameters were detected from downgradient compliance wells in November 2023 at concentrations above the calculated

Mr. Mark Bertram  
Big Rivers Electric Corporation  
January 26, 2024  
Page 2

background limits (equivalent to the MW-11 prediction limits), and a summary of the statistical evaluation is included in Attachment 1.

Given that none of the Appendix III constituents exhibited concentrations above their respective calculated background limit (i.e., no SSIs identified) at the Sebree Generating Station's Green Surface Impoundment groundwater monitoring network, further statistical evaluation was not required and the CCR unit will continue detection monitoring per the requirements of 40 CFR §257.94 for the next 2024 sampling event.

Sincerely,

Burns & McDonnell Engineering Company, Inc.

Chris Høglund, PG  
Project Manager



Attachments:

Table 1 – November 2023 Analytical Summary

Attachment 1 – Sanitas™ Statistical Outputs

cc: Hunter Mizell, BREC Sebree Station

**TABLE**

**Table 1**  
**Green Surface Impoundment - November 2023 Analytical Summary**  
**Sebree Generating Station**

APPENDIX III CONSTITUENTS	2023 Calculated Background <sup>1</sup>	Units	MW-11	MW-12	MW-13	MW-14	
			11/6/2023	11/6/2023	11/6/2023	11/6/2023	
			Upgradient Well	Downgradient Compliance Wells			
			Detection Monitoring				
Boron	0.9744	mg/L	0.44	0.24	0.10 U	0.13	
Calcium	415	mg/L	221	77.2	95.6	155	
Chloride	3967	mg/L	2060	20.3	27.1	104	
Fluoride	0.891	mg/L	0.2	0.5	0.2	0.3	
pH (Field Measurement)	6.367 - 7.552	SU	6.81	7.33	6.58	6.70	
Sulfate	2023	mg/L	855	64	100	176	
Total Dissolved Solids	5418	mg/L	4340	568	752	940	

**Notes:**

<sup>1</sup>Background values calculated from upgradient MW-11 data from April 2016 through November 2023.

mg/L = milligrams per Liter

SU = Standard units

U = Nondetect

**ATTACHMENT 1 - SANITAS™ STATISTICAL OUTPUTS**

# Prediction Limit

Big Rivers Electric Corp. Data: Green SI All Data Printed 12/7/2023, 3:38 PM

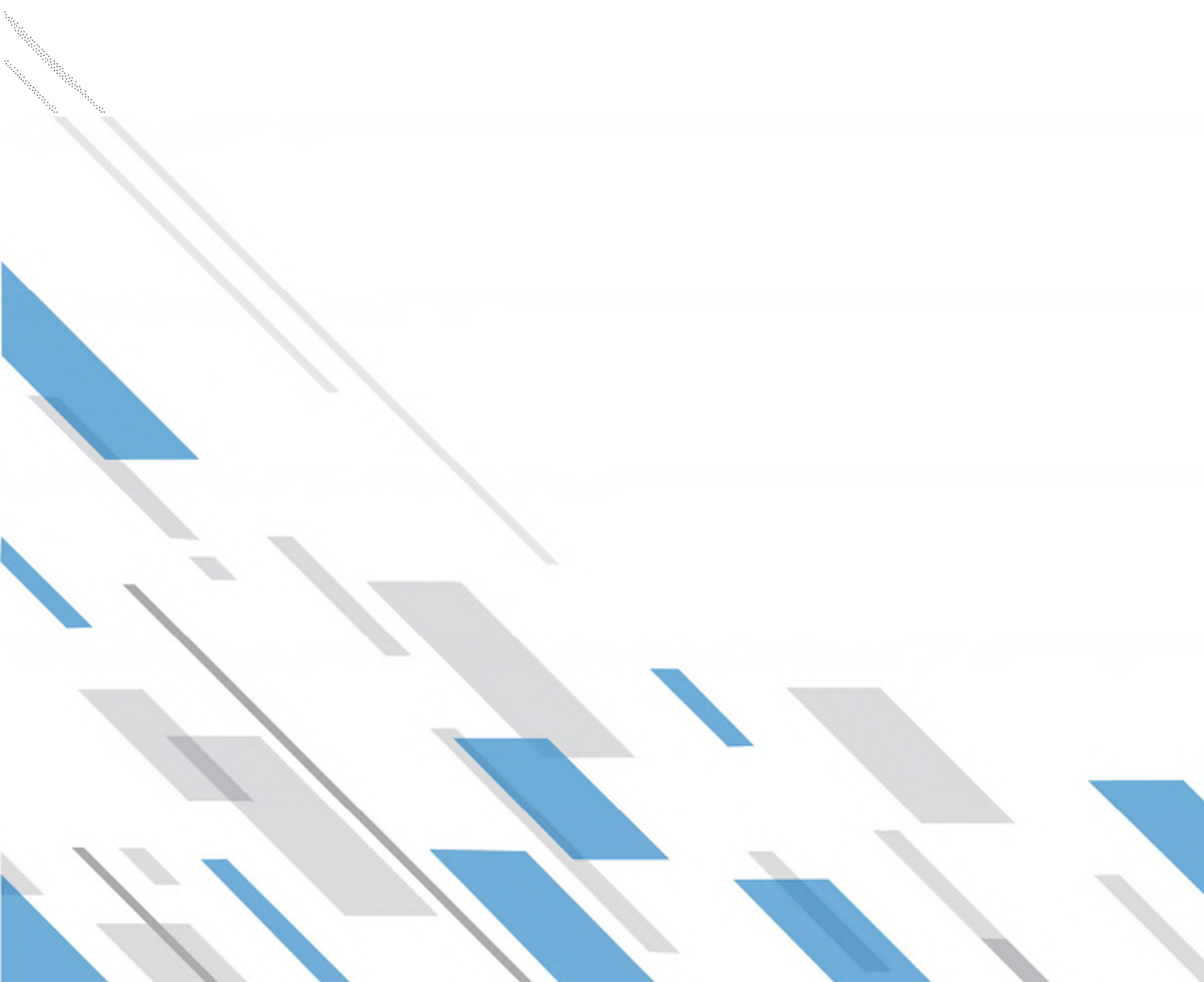
<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Date</u>	<u>Observ.</u>	<u>Sig.</u>	<u>Bg N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Boron (mg/L)	MW-12	0.9744	n/a	11/6/2023	0.24	No	21	14.29	x^3	0.01	Param Inter
Boron (mg/L)	MW-13	0.9744	n/a	11/6/2023	0.05ND	No	21	14.29	x^3	0.01	Param Inter
Boron (mg/L)	MW-14	0.9744	n/a	11/6/2023	0.13	No	21	14.29	x^3	0.01	Param Inter
Calcium (mg/L)	MW-12	415	n/a	11/6/2023	77.2	No	21	0	x^2	0.01	Param Inter
Calcium (mg/L)	MW-13	415	n/a	11/6/2023	95.6	No	21	0	x^2	0.01	Param Inter
Calcium (mg/L)	MW-14	415	n/a	11/6/2023	155	No	21	0	x^2	0.01	Param Inter
Chloride (mg/L)	MW-12	3967	n/a	11/6/2023	20.3	No	21	0	sqrt(x)	0.01	Param Inter
Chloride (mg/L)	MW-13	3967	n/a	11/6/2023	27.1	No	21	0	sqrt(x)	0.01	Param Inter
Chloride (mg/L)	MW-14	3967	n/a	11/6/2023	104	No	21	0	sqrt(x)	0.01	Param Inter
Fluoride (mg/L)	MW-12	0.891	n/a	11/6/2023	0.5	No	21	9.524	n/a	0.04353	NP Inter (normality)
Fluoride (mg/L)	MW-13	0.891	n/a	11/6/2023	0.2	No	21	9.524	n/a	0.04353	NP Inter (normality)
Fluoride (mg/L)	MW-14	0.891	n/a	11/6/2023	0.3	No	21	9.524	n/a	0.04353	NP Inter (normality)
pH [Field] (SU)	MW-12	7.552	6.367	11/6/2023	7.33	No	21	0	No	0.005	Param Inter
pH [Field] (SU)	MW-13	7.552	6.367	11/6/2023	6.58	No	21	0	No	0.005	Param Inter
pH [Field] (SU)	MW-14	7.552	6.367	11/6/2023	6.7	No	21	0	No	0.005	Param Inter
Sulfate (mg/L)	MW-12	2023	n/a	11/6/2023	64	No	21	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-13	2023	n/a	11/6/2023	100	No	21	0	No	0.01	Param Inter
Sulfate (mg/L)	MW-14	2023	n/a	11/6/2023	176	No	21	0	No	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-12	5418	n/a	11/6/2023	568	No	21	0	x^6	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-13	5418	n/a	11/6/2023	752	No	21	0	x^6	0.01	Param Inter
Total Dissolved Solids (mg/L)	MW-14	5418	n/a	11/6/2023	940	No	21	0	x^6	0.01	Param Inter



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**Sebree Generating Station  
Reid/HMP&L CCR Surface Impoundment**

# 2023 Annual Groundwater Monitoring and Corrective Action Report

**Revision 0**

**January 24, 2024**

**Issue Purpose: Client Use**

**Project No.: 14055-010**

**K P R G**

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## EXECUTIVE SUMMARY / OVERVIEW

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Groundwater monitoring requirements in accordance with Sections 257.94 and 257.95 of the U.S. Environmental Protection Agency's (EPA) Coal Combustion Residuals (CCR) Rule, 40 CFR Part 257 Subpart D, have been completed for the Reid/Henderson Municipal Power & Light (Reid/HMP&L) CCR Surface Impoundment (the Unit) at the Big Rivers Electric Corporation's (BREC) Sebree Generating Station (the Station) located in Webster County, Kentucky. The CCR monitoring well network for this Unit consists of four monitoring wells (MW-7 through MW-10) as shown on Figure 1. Well MW-7 is the background monitoring well, and wells MW-8, MW-9, and MW-10 are the downgradient monitoring wells. The Unit also has an assessment groundwater monitoring network to assist in defining the nature and extent of impacts as required under 40 CFR 257.95(g)(1). The current assessment network consists of wells MW-110, MW-111, and MW-112, which are also shown on Figure 1. Well MW-110 was installed in 1<sup>st</sup> Quarter 2019, while wells MW-111 and MW-112 were installed in 1<sup>st</sup> Quarter 2022.

This overview of the 2023 groundwater monitoring period is provided in accordance with revised requirements under Section 257.90(e)(6) of the CCR Rule. Each required item is discussed separately below.

- Section 257.90(e)(6)(i) – At the start of the current monitoring period, the subject CCR unit was operating under the assessment monitoring program in accordance with Section 257.95 of the CCR Rule.
- Section 257.90(e)(6)(ii) – At the end of the current monitoring period, the subject CCR unit continues to operate under the assessment monitoring program in accordance with Section 257.95 of the CCR Rule.
- Section 257.90(e)(6)(iii) – The following statistically significant increases (SSIs) above established background for the Appendix III detection monitoring constituents were noted during this monitoring period:

### CCR Wells

- MW-7 (upgradient) – none
- MW-8 – boron, calcium, chloride, fluoride, sulfate and total dissolved solids (both events)
- MW-9 – calcium and total dissolved solids (both events)
- MW-10 – boron, chloride, fluoride, pH, and total dissolved solids (both events)

Expanded Nature and Extent Assessment Wells

- MW-110 – boron, calcium chloride, sulfate, and total dissolved solids (both events)
- MW-111 – boron, chloride, and fluoride (both events); and pH and total dissolved solids (June only)
- MW-112 – chloride (both events); and boron (November only)

The initial statistical evaluation of Appendix III constituents determined that there were SSIs in downgradient monitoring wells relative to established background prediction limits for various Appendix III parameters at various downgradient monitoring locations. The monitoring program was transitioned to assessment monitoring under Section 257.95 of the CCR Rule in February 2018.

- Section 257.90(e)(6)(iv) – There was one only constituent confirmed at a statistically significant level (SSL) above groundwater protection standards for the Appendix IV assessment monitoring constituents for this Unit during this monitoring period. Specifically, this was for lithium at downgradient CCR monitoring well MW-10. This is consistent with previous monitoring periods.

The assessment of corrective measures (ACM) in accordance with Section 257.96(a) of the CCR Rule was initiated in January 2019. A public meeting was held on May 24, 2023 to present the results of the ACM and supporting hydrogeologic studies. A Final Report on Selection of Groundwater Remedy was issued on July 25, 2023.

- Section 257.90(e)(6)(v) – As noted above, the Final Report on Selection of Groundwater Remedy was issued on July 25, 2023. The selected remedy was identified as Alternative #2b which consists of closure by removal, institutional controls, and groundwater monitoring.
- Section 257.90(e)(6)(vi) – Remedial activities pursuant to Section 257.98 of the CCR Rule were initiated on July 31, 2023 with contractor mobilization to the site. Closure work is ongoing and is expected to be completed in 2024 (see Section 4.0 below for current status details).

## 1.0 INTRODUCTION

On behalf of Big Rivers Electric Corporation (BREC), KPRG Associates, Inc. (KPRG) and Sargent & Lundy (S&L) have prepared this Annual Groundwater Monitoring and Corrective Action Report for the Reid/Henderson Municipal Power & Light (Reid/HMP&L) CCR Surface Impoundment (the Unit) at the Sebree Generating Station (the Station) located in Webster County, Kentucky.

Groundwater sampling in accordance with the 2023 semi-annual assessment monitoring requirements promulgated by Sections 257.94 and 257.95 of the U.S. Environmental Protection Agency's (EPA) Coal Combustion Residuals (CCR) Rule, 40 CFR Part 257 Subpart D, have been successfully completed for the Unit. The CCR monitoring well network consists of four monitoring wells (MW-7 through MW-10) as shown on Figure 1. Well MW-7 is the upgradient, background monitoring location. Monitoring wells MW-8, MW-9 and MW-10 are the downgradient monitoring locations. The Unit also has an assessment groundwater monitoring network to assist in defining and monitoring the nature and extent of groundwater impacts as required under 40 CFR 257.95(g)(1). The current assessment network consists of wells MW-110, MW-111, and MW-112, which are also shown on Figure 1. Well MW-110 was installed in 1<sup>st</sup> Quarter 2019, while wells MW-111 and MW-112 were installed in 1<sup>st</sup> Quarter 2022.

This annual report covers the work performed relative to CCR groundwater monitoring during the calendar year 2023. It does not duplicate information or activities reported in previous annual submittals. It is prepared in accordance with 40 CFR 257.90(e)(1) through (6) and summarizes the sampling procedures used, provides an evaluation of groundwater flow conditions, summarizes the analytical data generated, presents the statistical evaluations and assessment monitoring completed, identifies the other key compliance actions completed during the year, and provides the current status of the site compliance activities along with recommendations.

## 2.0 FIELD PROCEDURES AND GROUNDWATER FLOW EVALUATION

### 2.1 FIELD PROCEDURES

As previously noted, the Unit's groundwater monitoring program consists of the CCR groundwater monitoring network around the Reid/HMP&L CCR Surface Impoundment (wells MW-7 through MW-10) and the assessment monitoring network (wells MW-110, MW-111 and MW-112), all as shown on Figure 1. Characterization well MW-110 was installed by AECOM in February 2019. It is noted that well MW-110 was installed without proper Kentucky Division of Waste Management (KDWM) approval. However, as discussed in the Supplemental Site Investigation Report dated September 1, 2022, the well was installed using recognized industry practices by a Kentucky licensed well driller. The groundwater sampling data from this well is believed to be representative of existing water quality and is only being used for screening purposes.

In February 2022, KPRG installed two additional characterization monitoring wells, MW-111 and MW-112, for the purposes of assisting with defining the extent of potential lithium impacts to the southwest and south-southeast of well MW-10 (KPRG and S&L, 2022). The wells were installed using rotary sonic drilling and constructed in accordance with the “Monitoring Well Drilling/Construction Specification” submitted to the Kentucky Energy and Environment Cabinet, Department of Environmental Protection, Division of Waste Management (DWM) on February 11, 2022, and verbally approved by the DWM on February 15, 2022, with formal written approval received on February 17, 2022. No new monitoring wells were installed in 2023.

As part of sampling procedures, the integrity of all monitoring wells was inspected and water levels were obtained using an electronic water level meter (see summary of water level discussion below). All wells were found in good condition with locked protector casings and intact concrete surface seals.

All groundwater samples were collected using the low-flow sampling technique from dedicated pumps. The samples were not filtered prior to analysis to provide for total metals concentrations as opposed to dissolved metals concentrations.

## 2.2 GROUNDWATER FLOW EVALUATION

Water level data measurements were obtained from each well during each round of semi-annual groundwater monitoring which occurred in June and November of 2023. A complete round of water levels was collected prior to initiating sampling, and the water level data for 2023 are summarized in Table 1.

**Table 1. Reid/HMP&L CCR Surface Impoundment – 2023 Groundwater Elevation Data**

Monitoring Well	Top of Casing Elevation (ft, amsl)	Groundwater Elevation (ft, amsl) June 2023*	Groundwater Elevation (ft, amsl) November 2023
MW-7	440.93	422.17	416.49
MW-8	394.29	388.32	387.20
MW-9	395.40	387.69	386.69
MW-10	422.27	388.52	387.15
MW-110	388.70	383.31	382.58
MW-111	403.57	387.70	386.78
MW-112	427.77	392.64	389.26

Note: \* - Water levels for assessment wells collected 6/30/23. All others collected 6/29/23.

The water levels were used to generate groundwater flow maps for the two sampling events, which are provided as Figures 2 and 3. A review of the maps indicates groundwater flow is consistently to the



southwest towards an unnamed tributary to Groves Creek located west-southwest of the impoundment. In accordance with general groundwater sampling requirements under 40 CFR 257.93(c), Table 2 provides a summary of the natural flow and an estimated rate of groundwater flow for each sampling event. The flow rate was calculated using the following equation:

$$V_s = \frac{Kdh}{n_e dl}, \text{ where:}$$

$V_s$  is seepage velocity (distance/time)

$K$  is hydraulic conductivity (distance/time)

$dh/dl$  is hydraulic gradient (unitless)

$n_e$  is effective porosity (unitless)

The hydraulic conductivity geometric mean of  $3.1 \times 10^{-5}$  cm/sec ( $1.02 \times 10^{-6}$  ft/sec) used in Table 2 was obtained from the slug test results completed on wells MW-10, MW-110, MW-111, and MW-112. The horizontal hydraulic gradient was obtained from the respective groundwater flow maps provided on Figures 2 and 3. An estimated effective porosity of the aquifer materials of 0.10 was used (Freeze and Cherry, 1979).

**Table 2. Reid/HMP&L CCR Surface Impoundment – Groundwater Seepage Velocity Estimates**

Date	Groundwater Flow Direction	$K_{avg}$ (ft/sec)	Average Hydraulic Gradient	Porosity (unitless)	Estimated Seepage Velocity (ft/day)
June 2023	Southwesterly	1.02E-6	0.021	0.1	0.019
November 2023	Southwesterly	1.02E-6	0.029	0.1	0.026

### 3.0 ANALYTICAL DATA AND MONITORING STATUS

#### 3.1 SAMPLING SUMMARY

The groundwater sampling summary from 2023 is provided in Table 3, in accordance with 40 CFR 257.90(e)(3). The table includes the event type dates of sampling and wells included in the sampling.

**Table 3. Reid/HMP&L CCR Surface Impoundment – Summary of Groundwater Sampling Events**

Event Type	Sampling Event	Dates	Wells Sampled
Assessment	Semi-Annual	June 29, 2023	MW-7 (upgradient), MW-8, MW-9, and MW-10
Characterization	Semi-Annual	June 30, 2023	MW-110, MW-111, and MW-112
Assessment	Semi-Annual	November 20-21, 2023	MW-7 (upgradient), MW-8, MW-9, and MW-10
Characterization	Semi-Annual	November 20-21, 2023	MW-110, MW-111, MW-112

### 3.2 DATA SUMMARY

As discussed in Section 1.0, this site is in assessment monitoring. The analytical data for each well from the assessment monitoring groundwater sampling for Appendix III and IV parameters are provided in Appendix A (Tables A-1 through A-7) along with calculated prediction limits and applicable Groundwater Protection Standards (GWPSs) under the CCR Rule for Appendix IV constituents. All tables include the sample dates and whether the specific well is considered upgradient or downgradient relative to groundwater flow and the Unit. The analytical data packages from these sampling events are provided in Appendix B. It is noted that updated background calculations for statistical purposes were completed by AECOM as part of the 2021 Annual Groundwater and Corrective Action Report and are considered to still be representative for statistical comparison purposes. The statistical background for the Appendix III and IV groundwater quality data at the Reid Surface Impoundment were evaluated by AECOM in 2021 using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. Monitoring well MW-7 is the designated background and monitoring wells MW-8, MW-9, and MW-10 are designated as compliance wells because they are located downgradient of the impoundment.

The statistical analyses were performed in accordance with the U.S. Environmental Protection Agency's Final CCR Rule 40 CFR Parts 257.93(f), 257.93(g), and 257.93(h) and the Groundwater Monitoring System and Statistical Methods Certification. Prediction limits (i.e., parametric or nonparametric) with 1 of 2 retesting were developed for each constituent based on the frequency of non-detect values and whether the background data for that constituent exhibited a normal, lognormal, or nonparametric distribution. For the statistical analysis, non-detect values were represented as one-half the detection limit. No outliers were identified in the background data. The background datasets were used to develop an upper prediction limit (UPL) for the Appendix III and IV background data at 95 percent confidence. Data from the downgradient monitoring wells for the same time period were compared to the UPL to identify statistically significant

increases (SSIs) over background. Mann-Kendall trend analysis was used to identify statistically significant increasing trends for constituents with SSIs. Appendix IV GWPSs were established as the higher of either the established federal maximum contaminant level (MCL) or the background 95% UPL for the specific compound. Recalculation of background values is not appropriate at this time because the Unit is under a semi-annual assessment sampling program. Recalculation of background statistics at this time would therefore not be in accordance with the Unified Guidance as sufficient new data has not been generated to verify that it is statistically viable to pool it with the existing background dataset. For semi-annual sampling programs, the *minimum* timeframe prior to recalculating background is 2 to 3 years based on the Unified Guidance.

Relative to the results of the expanded assessment monitoring program for the purposes of defining the extent of groundwater impacts, groundwater sampling was performed at the Unit in June and November 2023. The sampling included all existing and new monitoring wells. The groundwater samples were analyzed for the full list of CCR Rule Appendix III and Appendix IV parameters. The data are included in the tables provided in Appendix A along with all previous data for the wells. Detections above established prediction limits suggesting a statistically significant increase (SSI) in downgradient wells for both Appendix III and Appendix IV parameters are as follows:

#### Appendix III Parameters

##### CCR Wells

- MW-7 (upgradient) – none
- MW-8 – boron, calcium, chloride, fluoride, sulfate and total dissolved solids (both events)
- MW-9 – calcium and total dissolved solids (both events)
- MW-10 – boron, chloride, fluoride, pH, and total dissolved solids (both events)

##### Expanded Nature and Extent Assessment Wells

- MW-110 – boron, calcium chloride, sulfate, and total dissolved solids (both events)
- MW-111 – boron, chloride, and fluoride (both events); and pH and total dissolved solids (June only)
- MW-112 – chloride (both events); and boron (November only)

Appendix IV Parameters

CCR Wells

- MW-7 – thallium (June only)
- MW-8 – fluoride and lithium (both events); combined radium 226/228 (June only)
- MW-9 – barium (both events); and thallium (June only)
- MW-10 – barium, fluoride, and lithium (both events); mercury (November only); and combined radium 226/228 (June only)

Expanded Nature and Extent Assessment Wells

- MW-110 – lithium (both events); chromium and lead (November only); and thallium (June only)
- MW-111 – barium and fluoride (both events); and lithium (June only)
- MW-112 – barium (both events); chromium (November only); and thallium (June only)

Relative to statistically significant level (SSL) detections above established GWPSs, the data indicate results consistent with historical sampling with lithium being the only parameter that was detected above an established GWPS. None of the other noted SSIs for Appendix IV parameters were above the established GWPSs for those parameters. The new lithium data collected during the 2023 sampling events are summarized below in Table 4. Only lithium at well location MW-10 exceeds the established GWPS of 0.04 mg/l.

**Table 4. Reid/HMP&L CCR Surface Impoundment – 2023 Lithium Analytical Results**

Monitoring Well	Parameter	
	Lithium GWPS 0.04 mg/L	
	June 2023	November 2023
MW-7	0.007J	0.007J
MW-8	0.03	0.03M2
MW-9	0.006J	0.006J
MW-10	<b>0.52</b>	<b>0.54</b>

<b>MW-110</b>	0.01J	0.01J
<b>MW-111</b>	0.008J	0.008J
<b>MW-112</b>	0.006J	0.007J

J – Estimated value; M2 – Matrix spike recovery low, method control sample recovery acceptable.

The areal distribution of lithium impacts is provided on Figure 4, which includes all assessment lithium data generated to date. This illustrates that the extent of impacts above the GWPS for lithium has been defined, and the impacts appear to be limited to the general vicinity of well MW-10. This areal distribution suggests that impacts to groundwater likely originated as seepage from beneath the southern portion of the surface impoundment, possibly due to the added driving head associated with the pond water within this portion of the Unit. However, at this time there is currently no feasible means of directly tracing that potential under the footprint of the Unit. It is noted that subsequent numerical groundwater modeling performed in support of groundwater remedy engineering evaluations corroborates this hypothesis.

### 3.3 CURRENT MONITORING STATUS

The site continues to be in semi-annual assessment monitoring. No further delineation of lithium impacts is proposed at this time.

## 4.0 CORRECTIVE ACTION STATUS

During this annual reporting period, a remedy was selected to address the lithium impacts at the Unit observed at monitoring well MW-10 during this and previous annual reporting periods. As documented in the Assessment of Corrective Measures (ACM) performed for the Unit in accordance with Section 257.96(a) of the CCR Rule (AECOM, 2019c), the following five corrective measures alternatives were developed and evaluated as potential remedies:

- Alternative #1: No Action and Groundwater Monitoring
- Alternative #2a: Closure in Place (CiP), Institutional Controls (ICs), and Groundwater Monitoring
- Alternative #2b: Closure by Removal (CbR), ICs, and Groundwater Monitoring
- Alternative #3: CiP, ICs, Hydraulic Containment, Other Source Control, Ex-Situ Treatment, and Groundwater Monitoring
- Alternative #4: CiP, ICs, Physical Containment, Ex-Situ Treatment, and Groundwater Monitoring

To determine the most appropriate remedy of the five preceding options, an evaluation was performed in accordance with EPA guidance on selecting remedies under the Resource Conservation and Recovery Act (EPA, 2000) and in accordance with the threshold and balancing performance criteria prescribed by the CCR Rule. Based on the results of this evaluation, Alternative #2b (CbR, ICs, and Groundwater Monitoring) was selected. On May 24, 2023, a public meeting was held in Henderson, Kentucky, to discuss the evaluation of potential remedies, the supporting hydrogeologic studies, and the proposed remedy. Finally, the final report

describing the selected remedy and how the selected remedy meets the standards specified in Section 257.97(b) of the CCR Rule was finalized on July 25, 2023 (S&L and KPRG, 2023b).

On July 31, 2023, closure construction activities commenced at the Unit. Through January 2, 2024, approximately 303,000 cubic yards of CCR have been removed from the Unit and disposed of in the on-site landfill. It is estimated that approximately 537,000 cubic yards of CCR remain in the Unit. Closure is expected to be completed in 2024.

## **5.0 SUMMARY / CONCLUSIONS AND RECOMMENDATIONS**

The site continues to be in semi-annual assessment monitoring. The assessment monitoring requirements in accordance with the CCR Rule are being successfully met. Only monitoring well MW-10 has shown a concentration of one Appendix IV parameter above the established GWPSs. Specifically, lithium was detected at this location in all 2023 sampling events above its GWPS of 0.4 mg/l. The corrective action is ongoing, with closure expected to be completed in 2024 (see Section 4.0 for additional details on remedy selection and status).

At this time, it is recommended to continue with semi-annual assessment monitoring in accordance with 40 CFR 257.95. The next sampling event should be scheduled for the June 2024 timeframe.

## 6.0 REFERENCES

AECOM, 2018. 2016-2017 Annual Groundwater Monitoring and Corrective Action Report, Sebree Generating Station, Webster County, Kentucky, January 2018.

AECOM, 2019a. 2018 Annual Groundwater Monitoring and Corrective Action Report, Sebree Generating Station, Webster County, Kentucky, January 2019.

AECOM, 2019b. Remedy Selection Progress Report, Reid/HMP&L Surface Impoundment, Sebree Generating Station, Webster County, Kentucky, December 2019.

AECOM, 2019c. Assessment of Corrective Measures Under the CCR Rule, CCR Surface Impoundment, Reid/HMP&L Station, Webster County, Kentucky, June 2019.

AECOM, 2020. 2019 Annual Groundwater Monitoring and Corrective Action Report, Sebree Generating Station, Henderson and Webster Counties, Kentucky, January 2020.

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AECOM, 2022. 2021 Annual Groundwater Monitoring and Corrective Action Report, Sebree Generating Station, Henderson and Webster Counties Kentucky January 2022.

EPA, 2000. "Fact Sheet #3: Final Remedy Selection for Results-Based RCRA Corrective Action." *RCRA Corrective Action Workshop On Results-Based Project Management: Fact Sheet Series*. March 2000.

Freeze, R.A. and Cherry, J.A., 1979. *Groundwater*. Prentice-Hall, Inc. Publishing.

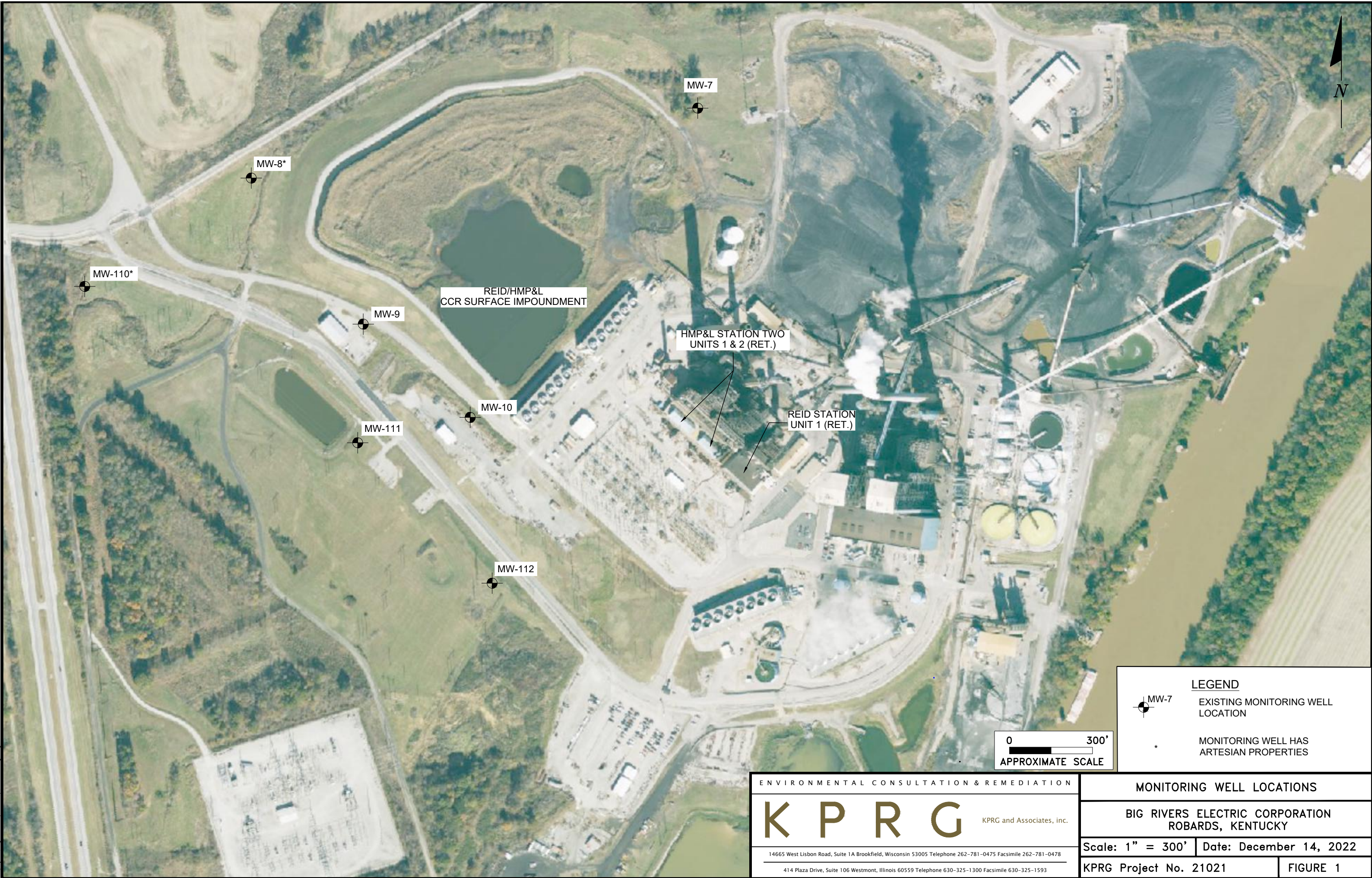
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S&L and KPRG, 2023a. 2022 Annual Groundwater Monitoring and Corrective Action Report. Sebree Generating Station, Reid/HMP&L CCR Surface Impoundment. Rev. 0. January 2023.

S&L and KPRG, 2023b. Final Report on Selection of Groundwater Remedy. Sebree Generating Station, Reid/HMP&L CCR Surface Impoundment. Rev. 0. July 2023.

## **FIGURES**

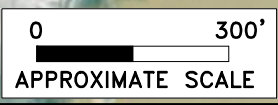




**LEGEND**

MW-7 EXISTING MONITORING WELL LOCATION

\* MONITORING WELL HAS ARTESIAN PROPERTIES



ENVIRONMENTAL CONSULTATION & REMEDIATION

**K P R G** KPRG and Associates, inc.

14665 West Lisbon Road, Suite 1A Brookfield, Wisconsin 53005 Telephone 262-781-0475 Facsimile 262-781-0478

414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

**MONITORING WELL LOCATIONS**

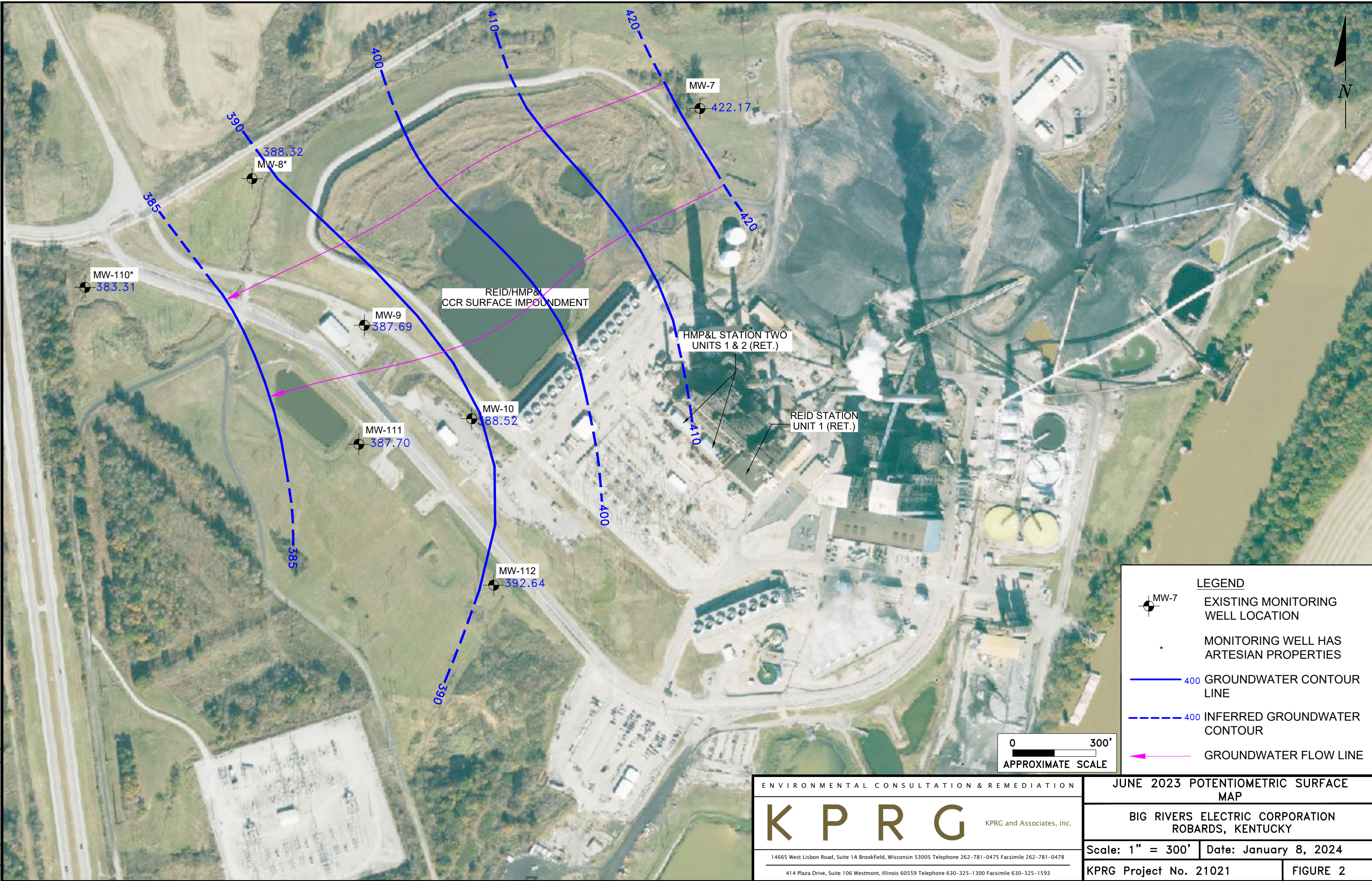
BIG RIVERS ELECTRIC CORPORATION  
ROBARDS, KENTUCKY

Scale: 1" = 300' | Date: December 14, 2022

KPRG Project No. 21021 | FIGURE 1

\\projects.sargent & lundy-kentucky\KPRG drawings.dwg





MW-110\*  
383.31

MW-8\*  
388.32

MW-9  
387.69

MW-11  
387.70

MW-10  
388.52

MW-112  
392.64

MW-7  
422.17

REID/HMP&  
CCR SURFACE IMPOUNDMENT

HMP&L STATION TWO  
UNITS 1 & 2 (RET.)

REID STATION  
UNIT 1 (RET.)

**LEGEND**

- MW-7 EXISTING MONITORING WELL LOCATION
- \* MONITORING WELL HAS ARTESIAN PROPERTIES
- 400 GROUNDWATER CONTOUR LINE
- 400 INFERRED GROUNDWATER CONTOUR
- GROUNDWATER FLOW LINE

0 300'  
APPROXIMATE SCALE

ENVIRONMENTAL CONSULTATION & REMEDIATION

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JUNE 2023 POTENTIOMETRIC SURFACE MAP

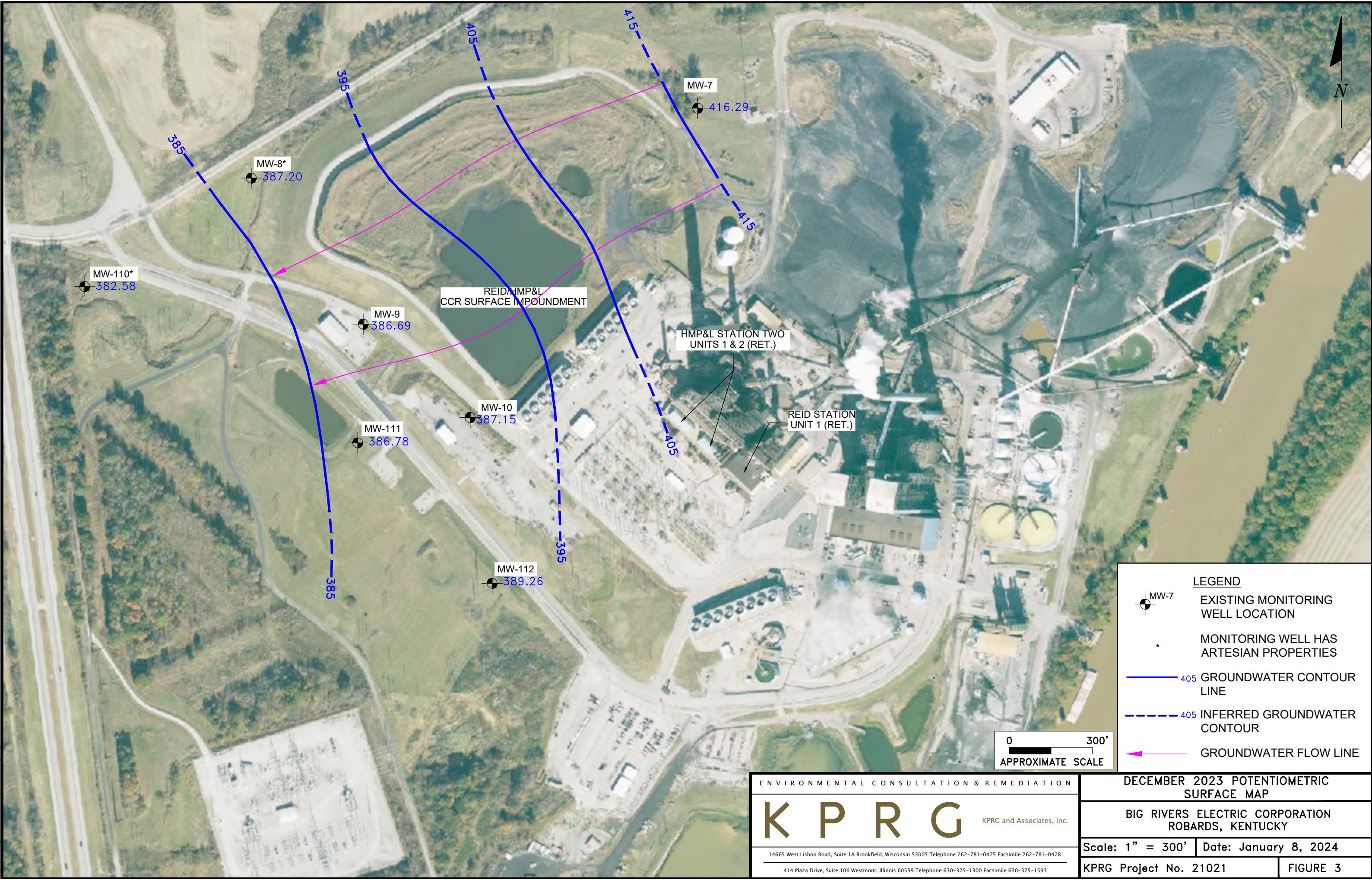
BIG RIVERS ELECTRIC CORPORATION  
ROBARDS, KENTUCKY

Scale: 1" = 300' Date: January 8, 2024

KPRG Project No. 21021 FIGURE 2

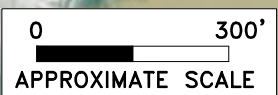
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**LEGEND**

- MW-7 EXISTING MONITORING WELL LOCATION
- \* MONITORING WELL HAS ARTESIAN PROPERTIES
- 405 GROUNDWATER CONTOUR LINE
- 405 INFERRED GROUNDWATER CONTOUR
- GROUNDWATER FLOW LINE



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DECEMBER 2023 POTENTIOMETRIC SURFACE MAP

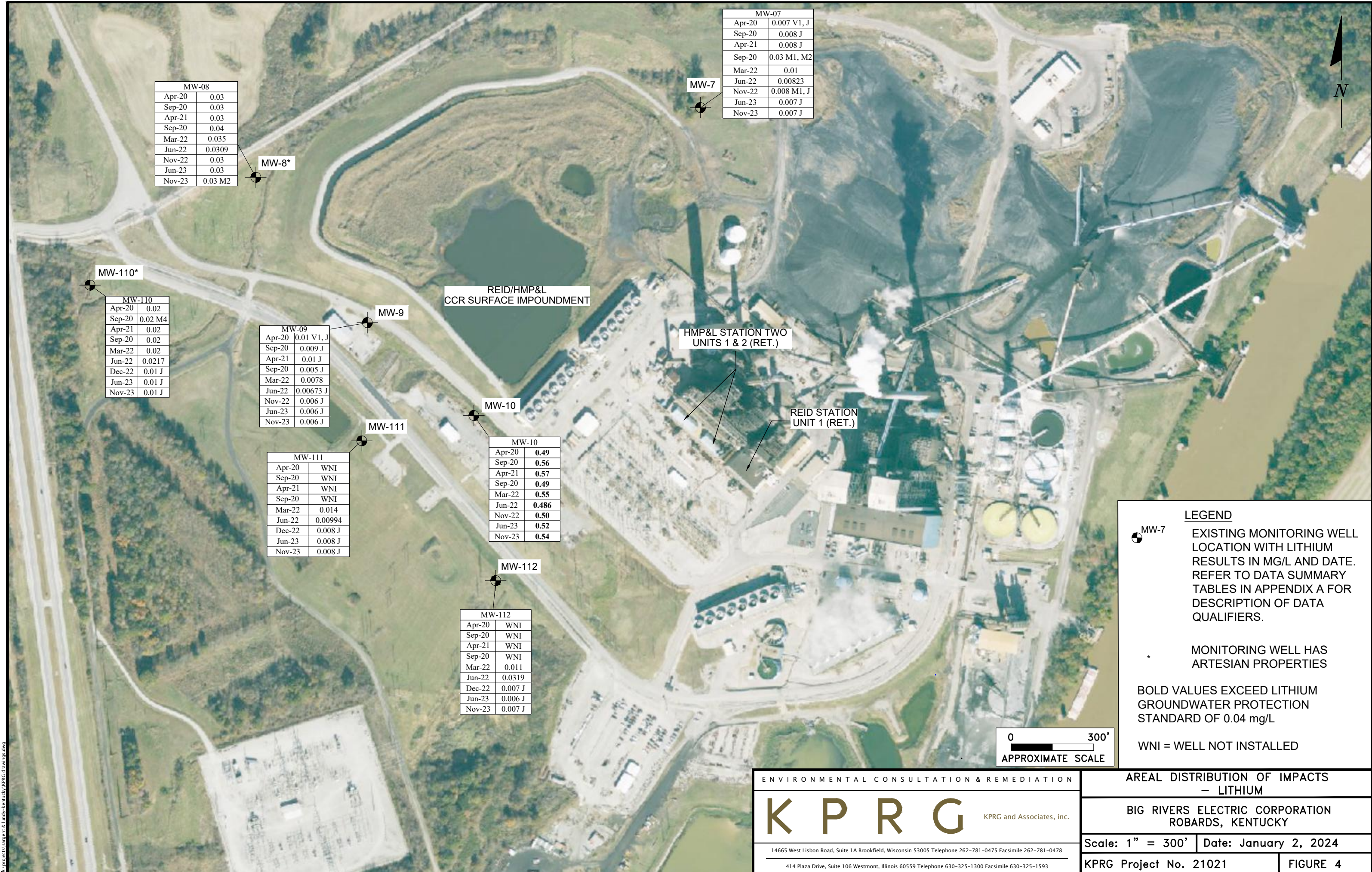
BIG RIVERS ELECTRIC CORPORATION  
ROBARDS, KENTUCKY

Scale: 1" = 300' Date: January 8, 2024

KPRG Project No. 21021 FIGURE 3

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MW-8	
Apr-20	0.03
Sep-20	0.03
Apr-21	0.03
Sep-20	0.04
Mar-22	0.035
Jun-22	0.0309
Nov-22	0.03
Jun-23	0.03
Nov-23	0.03 M2

MW-7	
Apr-20	0.007 V1, J
Sep-20	0.008 J
Apr-21	0.008 J
Sep-20	0.03 M1, M2
Mar-22	0.01
Jun-22	0.00823
Nov-22	0.008 M1, J
Jun-23	0.007 J
Nov-23	0.007 J

MW-110	
Apr-20	0.02
Sep-20	0.02 M4
Apr-21	0.02
Sep-20	0.02
Mar-22	0.02
Jun-22	0.0217
Dec-22	0.01 J
Jun-23	0.01 J
Nov-23	0.01 J

MW-9	
Apr-20	0.01 V1, J
Sep-20	0.009 J
Apr-21	0.01 J
Sep-20	0.005 J
Mar-22	0.0078
Jun-22	0.00673 J
Nov-22	0.006 J
Jun-23	0.006 J
Nov-23	0.006 J

MW-111	
Apr-20	WNI
Sep-20	WNI
Apr-21	WNI
Sep-20	WNI
Mar-22	0.014
Jun-22	0.00994
Dec-22	0.008 J
Jun-23	0.008 J
Nov-23	0.008 J

MW-10	
Apr-20	<b>0.49</b>
Sep-20	<b>0.56</b>
Apr-21	<b>0.57</b>
Sep-20	<b>0.49</b>
Mar-22	<b>0.55</b>
Jun-22	<b>0.486</b>
Nov-22	<b>0.50</b>
Jun-23	<b>0.52</b>
Nov-23	<b>0.54</b>

MW-112	
Apr-20	WNI
Sep-20	WNI
Apr-21	WNI
Sep-20	WNI
Mar-22	0.011
Jun-22	0.0319
Dec-22	0.007 J
Jun-23	0.006 J
Nov-23	0.007 J

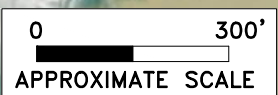
**LEGEND**

MW-7  
EXISTING MONITORING WELL LOCATION WITH LITHIUM RESULTS IN MG/L AND DATE. REFER TO DATA SUMMARY TABLES IN APPENDIX A FOR DESCRIPTION OF DATA QUALIFIERS.

\*  
MONITORING WELL HAS ARTESIAN PROPERTIES

BOLD VALUES EXCEED LITHIUM GROUNDWATER PROTECTION STANDARD OF 0.04 mg/L

WNI = WELL NOT INSTALLED



ENVIRONMENTAL CONSULTATION & REMEDIATION

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414 Plaza Drive, Suite 106 Westmont, Illinois 60559 Telephone 630-325-1300 Facsimile 630-325-1593

AREAL DISTRIBUTION OF IMPACTS  
- LITHIUM

BIG RIVERS ELECTRIC CORPORATION  
ROBARDS, KENTUCKY

Scale: 1" = 300' Date: January 2, 2024

KPRG Project No. 21021 FIGURE 4

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## **APPENDIX A**

### **Groundwater Quality Data Summary Tables**

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
Table A-1. MW-7 (up-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE																									
			3/30/2016	5/31/2016	8/23/2016	10/18/2016	1/31/2017	5/11/2017	8/23/2017	9/22/2017	10/11/2017	4/6/2018	6/29/2018	9/26/2018	5/2/2019	10/16/2019	4/16/2020	9/24/2020	4/21/2021	9/29/2021	3/16/2022	6/07/2022	11/30/2022	6/29/2023	11/21/2023			
			Baseline Events										Assessment		Re-Sample		Assessment											
Boron	0.3676	NA	0.246	0.245 J	0.271 J	0.250 J	0.33 J	0.295 J	0.286 JB	0.268 J	0.320 J			0.249 J	0.299 J	0.309 JB	ND D2, M4,	0.34 M4	0.33 M2, M4	0.34	1.77 D1, M2	0.36	0.329		0.35 M1	0.33		
Calcium	48.11	NA	41.1	42.1 B	42.3	47.6	41.5 B	41.1	45.1	40.6	41.8 B			46.6	41.6 B	46.1	44.4 D2	45.7 D2, M2	41.8 D2,	43.4 D1	27 D1, M2	46.2	40.5		43.1 D1, M1, M2	44.1 D1	39.4 D1	
Chloride	6.95	NA	2.48 JB	2.52 J	2.93 JB F1	3.26 B F1	4.02 B	5.73 B	4.99 F1 B	5.28 F1 B	3.65 B			6.88 B F1	5.38 B	4.94	4.7	4.1	3.3	4.9	6.5	4.7	3.16		2.8	2.6	3	
Fluoride	0.3622	4	ND J	ND J	ND J F1	ND J F1	ND JB	ND J						ND J	ND J	0.255 J	0.3		0.3		0.5	0.29	0.26		0.3	0.2	0.3	
Sulfate	26.59	NA	12.8	13.2	15.9	18.8	23.6 B	25.7	22.3 B	16.6 B	14.2 F1			23.4	18.7 B	16.8 B	19	15	12	15	34 D	19	12.6		11	10	11	
pH (Field Measurement)	8.034-6.483	NA	7.39	7.47	7.6	7.16	7.74	7.26	7.23	7.36	7.36		7.01	7.17	6.94	7.46	7.07	6.86	6.56	7.75	7.80	7.67	7.18		7.51	7.69 H3	7.18	
Total Dissolved Solids	310.7	NA	233	243	243	250	253	291	290	267	278			295	263	271	228	148	114	280	610	263	234		262	186	238	
APPENDIX IV CONSTITUENTS																												
Antimony	0.0008951	0.006	ND	ND JB	ND JB	ND J	ND	ND	ND JB	ND JB	NA	ND JB	ND JB	NA	0.000760 JB	ND U	<0.005	<0.005 M2	<0.005 U	<0.005 M2, U	<0.00051	ND		ND M3, U	<0.002 U	<0.002 U		
Arsenic	0.003938	0.01	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND JB	ND JB	NA	0.00116 J	0.0014	0.0025	0.0015 M2	0.0026	<0.001 M2, U	0.0022	0.002 J		0.0037 M1	0.002	0.003		
Barium	0.0908	2	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	ND J	ND J	ND J	0.0824 J	0.062	0.087	0.075 M3	0.082	0.074 M2	0.074	0.074		0.079 M1	0.076	0.076		
Beryllium	0.0005	0.004	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND U	<0.0020 V1	<0.002	<0.0020 U	<0.002 M2, U	<0.00027	ND		ND M1, U	<0.0010 U	<0.0010 U		
Cadmium	0.000076	0.005	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND U	<0.0010	<0.001 M2	<0.0010 U	<0.001 M2, U	<0.00022	ND		ND M1, U	<0.0001 U	<0.0001 U		
Chromium	0.00171	0.1	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND JB	ND JB	NA	0.00136 J	ND U	<0.0020	<0.002 M2	0.0007 J	<0.002 M2, U	0.0019 J	ND		ND M1, U	<0.0006 U	<0.0006 U		
Cobalt	0.00239	0.006	ND J	ND J	ND J	ND J	ND J	ND JB	ND J	ND J	NA	ND J	ND J	NA	0.000158 J	ND U	<0.004	<0.004 M2	<0.004 U	<0.004 M2, U	0.0005	3E-04 J		ND M1, U	<0.004 U	<0.004 U		
Fluoride	0.3622	4	ND J	ND J	ND J F1	ND J F1	ND JB	ND J	ND J F1	ND J F1	NA	ND J	ND J	ND J	0.255 J	0.3	0.3	0.3	0.3	0.5	0.292	0.26		0.3	0.2	0.3		
Lead	0.0064	0.015	ND J	ND JB	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	0.0000730 J	ND U	<0.002	<0.002 M2	<0.002 U	<0.002 U	0.00047 J	ND		ND M1, U	<0.0005 U	0.0005 J		
Lithium	0.00994	0.04	ND J	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	0.008 J	0.007 V1, J	0.008 J	0.008 J	0.008 J	0.03 M1, M2	0.0101	0.008		0.008 M1, J	0.007 J	0.007 J		
Mercury	0.000135	0.002	ND	ND	ND	ND	ND	ND	0.000135	ND	NA	ND	NA	NA	ND	ND U	<0.0005	<0.000 M2	<0.0005 U	<0.000 M2, U	0.00025	ND		ND M1, M2, U	<0.0002 U	<0.0002 U		
Molybdenum	0.01745	0.1	0.0109	0.0185	0.0136	0.0118	0.0127	ND J	ND J	ND J	NA	ND J	ND J	ND J	0.00442 J	0.01	0.006 J	0.006 M2, J	0.005 J	<0.01 M2, U	0.0096	0.012		0.01 M1	0.007 J	0.009 J		
Radium 226																												
Radium 228	1.844 pCi/L	5 pCi/L	0.865	0.685	0.473	ND	0.921	0.662	0.795	0.642	NA	0.650	1.15	0.730	0.698	0.652 -0.208	1.83	0.968	0.703	0.912	0.531	0.610 U	1.130		1.81	0.562		
Selenium	0.00066	0.05	ND	ND	ND	ND J	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND U	<0.003	<0.003 M2	<0.003 U	<0.003 U	<0.00074	ND		ND M1, U	<0.001 U	<0.001 U		
Thallium	0.000058	0.002	ND	ND J	ND J	ND	ND	ND	ND	ND	NA	ND	NA	NA	ND	ND U	<0.0020	<0.002 M2	<0.0020	<0.002 M2, U	<0.00047	3E-04 J		ND M1, U	0.0001 J	<0.0001 U		

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

ND = Not Detected at or above Method Detection Limit

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.

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

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

**BOLD** - Exceeds GWPS

NA = Not Analyzed

pCi/L = picoCuries per Liter

B = Compound was found in the blank and sample.

F1 = MS and/or MSD Recovery is outside acceptance limits.

D2 = Sample required dilution due to matrix interference

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

M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable

H3 - Sample received and analyzed past holding time.

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
Table A-2. MW-8 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE																								
			3/30/2016	5/31/2016	8/23/2016	10/18/2016	1/31/2017	5/11/2017	8/23/2017	9/22/2017	10/11/2017	5/2/2018	4/6/2018	6/29/2018	9/26/2018	5/2/2019	10/17/2019	4/16/2020	9/24/2020	4/21/2021	9/29/2021	3/15/2022	6/7/2022	11/30/2022	6/29/2023	11/20/2023	
Barium	0.3676	NA	1.46	1.07	1.3	1.00	1.74	1.60 B	1.37 B	1.32	1.54	0.309 JB		1.32	1.46	1.41 B	1.49 D2	1.56 D1	1.41 D2	1.42 D1, M4	1.5 D1	1.6	1.52	1.53	1.60 D1	1.48 D1, M1	
Calcium	48.11	NA	283	242 B	228	194	235 B	251	253	228	235 B	46.1		253	254 B	272	267 D1	292 D1	257 D1	281 D1, M2	267 D1	260	257	281	276 D1	251 D1, M1	
Chloride	6.95	NA	48.7	38.2 J	41.4 B	66.4 JB	42.1 B	43.6 B	47.1 B	58.5 JB	38.6 B	4.94		42.0 B	46.3 B	57.2	49.5	47.3	49.2	45.8 D	61.4 D	49	49.3	42.3	48.2	46.5 M2	
Fluoride	0.3622	4	ND J	ND J F1	ND J	ND J	ND JB	ND J	ND J	ND J	ND J	0.255 J		ND J	ND J	0.370 J	0.4	0.4	0.4	0.3	0.4	0.42	0.386	ND U	0.4	0.4 M2	
Sulfate	26.59	NA	1100 HB	1140	1120	1080	1220 B	1180 B	1110	1440 B	1040	16.8 B		1050	1180 B	1220 B	1240 D	1130 D	1400 D	1090 D	2320 D	1230	1240	1,330 D	1450 D	1600 D, M1	
pH (Field Measurement)	8.034-6.483	NA	7.13	7.14	7.37	7.06	7.10	7.11	7.10	7.15	7.46		6.97	7.09	6.93	7.25	7.04	6.78	6.58	6.64	6.12	7.21	6.72	7.88	7.56 H3	7.08	
Total Dissolved Solids	310.7	NA	1930	1980	1960	2030	2010	1990	2090	2030	2100	271		2060	1990	2090	2200	1930	1940	2000	2090	2030	2010 B	2,140	2030	1780	
APPENDIX IV CONSTITUENTS																											
Antimony	0.008951	0.006	ND	ND JB	ND JB	ND J	ND	ND JB	ND JB	ND JB	NA	0.000760 B	ND JB	ND JB	NA	0.000205 JB	ND U	<0.005	<0.005	<0.005 U	<0.005 U	<0.00051	ND	ND U	<0.002 U	<0.002 U	
Arsenic	0.003938	0.01	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.00116 J	ND JB	ND JB	NA	0.000438 J	ND U	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.00028	ND	ND U	<0.0004 U	<0.0004 U	
Barium	0.0908	2	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.0824 J	ND J	ND J	ND J	0.0188 J	0.016	0.017	0.016	0.018	0.02	0.016	0.017	0.042	0.015	0.016	
Beryllium	0.0005	0.004	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	ND	ND U	<0.0020 V1	<0.0020	<0.0020 U	<0.0020 U	<0.00027	ND	ND U	<0.0010 U	<0.0010 M2, U	
Cadmium	0.000076	0.005	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	ND	ND U	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.00022	ND	ND U	<0.0001 U	<0.0001 U	
Chromium	0.00171	0.1	ND	ND J	ND	ND	ND	ND	ND	ND	NA	0.00136 J	ND JB	ND JB	NA	0.00320	ND U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.0015	ND	ND U	<0.0006 U	<0.0006 U	
Cobalt	0.00239	0.006	ND	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.000158 J	ND J	ND J	NA	0.000141 J	ND U	<0.004	<0.004	<0.004 U	<0.004 U	<0.00026	ND	ND U	<0.004 U	<0.004 U	
Fluoride	0.3622	4	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.255 J	ND J	ND J	ND J	0.370 J	0.4	0.4	0.4	0.3	0.4	0.42	0.386	ND U	0.4	0.4 M2	
Lead	0.00064	0.015	ND	ND	ND	ND	ND	ND	ND	ND	NA	0.0000730 J	ND	ND	NA	0.000104 J	ND U	<0.002	<0.002	<0.002 U	<0.0020 U	<0.00017	ND	ND U	<0.0005 U	<0.0005 U	
Lithium	0.00994	0.04	0.0314 J	0.035 J	0.0314 J	0.0324 J	0.0408 J	0.0377 J	0.0367 J	0.0375 J	NA	ND	0.0347 J	0.0368 J	0.0375 J	0.0370 J	0.03	0.03	0.03	0.03	0.04	0.035	0.031	0.03	0.03	0.03 M2	
Mercury	0.000135	0.002	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	ND	ND	ND U	<0.0005	<0.0005	<0.0005 U	<0.0005 U	0.00019 J H	ND	2E-04 J	<0.0002 U	<0.0002 M1, Y2, U	
Molybdenum	0.01745	0.1	0.0138 J	0.0186	0.0157	0.0147	0.0173	0.0158	0.0175	0.0139	NA	0.00442 J	0.0147	0.0140	0.0149	0.0146	0.01	0.01	0.01	0.01	0.01	0.013	0.013	0.01	0.01	0.01	
Radium 226																											
Radium 228	1.844 pCi/L	5 pCi/L	1.98	1.32	1.36	1.36	1.92	1.12	1.48	1.4	NA	0.698	1.29	1.6	1.46	1.43	0.914	1.93	0.366	1.94	1.72	1.17	0.52	1.06	2.18	1.82	
Selenium	0.00066	0.05	ND	ND	ND	ND J	ND	ND	ND	ND J	NA	ND	ND	NA	NA	0.000634 J	ND U	<0.003	<0.003	<0.003 U	<0.003 U	<0.00074	ND	ND U	<0.001 U	<0.001 U	
Thallium	0.000058	0.002	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	NA	0.0000470 J	ND U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.00047	ND	ND U	<0.0001 U	<0.0001 U	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
GWPS = Groundwater Protection Standard  
ND = Not Detected at or above Method Detection Limit  
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.  
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  
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  
**BOLD** - Exceeds GWPS

NA = Not Analyzed  
pCi/L = picoCuries per Liter  
B = Compound was found in the blank and sample.  
F1 = MS and/or MSD Recovery is outside acceptance limits.  
D2 = Sample required dilution due to matrix interference  
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  
M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable  
H3 - Sample received and analyzed past holding time.

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
Table A-3. MW-9 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE																											
			3/30/2016	5/31/2016	8/23/2016	10/18/2016	1/31/2017	5/11/2017	8/23/2017	9/22/2017	10/11/2017	5/2/2018	4/6/2018	6/29/2018	9/26/2018	5/2/2019	10/17/2019	4/16/2020	9/24/2020	4/21/2021	9/29/2021	3/15/2022	6/07/2022	11/30/2022	6/29/2023	11/21/2023				
			Baseline Events												Assessment		Re-Sample		Assessment											
Boron	0.3676	NA	0.316	0.264 J	0.333 J	0.257 J	0.431 J	0.362 JB	0.101 JB	0.0844 J	0.0816 J	0.309 JB	0.239 J	0.0857 J	0.307 JB	ND D2, U	0.32	0.22	0.23	<0.10 U	0.084 J	0.078 J	ND U	<0.10 U	<0.10 V1, U					
Calcium	48.11	NA	64.1	71.2 B	71.5	72.3	75.0 B	72.9	60.8	57.5	57.0 B	46.1	68.6	60.3 B	68.6	66.8 D2	71.2 D2	65.3 D2	66.9 D1	59.4 D1	61	62.4	60.5	62.3 D1	59.4 D1					
Chloride	6.95	NA	26.5 B	30.9	36.6 B	32.6 B	42.4 B	38.0 B	6.40 B	7.14 B	5.83 B	4.94	31.2 B	6.93 B	21.8	17.6	22.8	22.5	7.2	6.7	6.6	6.7	6.1	6.5						
Fluoride	0.3622	4	ND J	ND J	ND J	ND J	ND JB	ND J	ND J	ND J	ND J	0.255 J	ND J	ND J	0.223 J	0.2	0.3	0.2	0.2	0.20	0.192	0.2	0.2	0.2						
Sulfate	26.59	NA	9.51	17.6	27.7	39.6	57.2 B	30.4	ND J	ND JB	ND J	16.8 B	ND J	0.481 JB	0.223 JB	ND U	<1	<1	<1 U	<0.35	ND	0.6 J	0.5 J	<0.5 U						
pH (Field Measurement)	8.034-6.483	NA	7.32	7.27	7.55	7.13	7.64	7.31	7.04	7.04	7.04	7.46	7.13	7.00	6.69	7.22	7.04	6.67	7.12	6.23	7.05	6.53	7.74	7.45 H3	6.93					
Total Dissolved Solids	310.7	NA	363	389	403	409	465	435	303	308	316	271	399	293	392	320	308	422	264	298	291 H	306	338	314						
APPENDIX IV CONSTITUENTS																														
Antimony	0.0008951	0.006	ND	ND JB	ND JB	ND J	ND	ND JB	ND JB	ND JB	NA	0.0000760 B	ND JB	ND JB	NA	0.000192 JB	ND U	<0.005	<0.005	<0.005 U	<0.005 U	<0.00051	ND	ND U	<0.002 U	<0.002 U				
Arsenic	0.003938	0.01	ND	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.00116 J	ND JB	ND JB	NA	0.000563 J	ND U	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.00028	ND	ND U	<0.0004 U	<0.0004 U					
Barium	0.0908	2	1.1	1.03	0.889	0.635	0.827	0.833	0.253	0.227	NA	0.0824 J	0.967	0.777	0.288	1.03	0.763	1.06 D1	0.730	0.782	0.248	0.26	0.258	0.253	0.245	0.251				
Beryllium	0.0005	0.004	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	NA	NA	ND	ND	<0.0020 V1	<0.0020	<0.0020 U	<0.0020 U	<0.00027	ND	ND U	<0.0010 U	<0.0010 U				
Cadmium	0.000076	0.005	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	NA	NA	ND	ND	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.00022	ND	ND U	<0.0001 U	<0.0001 U				
Chromium	0.00171	0.1	ND	ND	ND	ND	ND	ND	ND	NA	0.00136 J	ND JB	ND JB	NA	0.00316	ND U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.0015	ND	0.0048	<0.0006 U	<0.0006 U					
Cobalt	0.00239	0.006	ND	ND J	ND J	ND J	ND J	ND J	ND J	NA	0.000158 J	ND JB	ND J	NA	0.0000550 J	ND U	<0.004	<0.004	<0.004 U	<0.004 U	<0.00026	ND	ND U	<0.004 U	<0.004 U					
Fluoride	0.3622	4	ND J	ND J	ND J	ND J	ND JB	ND J	ND J	ND J	NA	0.255 J	ND JB	ND J	0.223 J	0.2	0.3	0.3	0.2	0.2	0.20	0.192	0.2	0.2						
Lead	0.0064	0.015	ND	ND JB	ND	ND J	ND	ND	ND	NA	0.0000730 J	ND	ND	NA	0.0000760 J	ND U	<0.002	<0.002	<0.002 U	<0.002 U	<0.00017	ND	ND U	<0.0005 U	<0.0005 U					
Lithium	0.00994	0.04	0.0120 J	0.0105 J	0.0102 J	0.0119 J	0.0179 J	0.0136 J	ND	ND	0.0108 JB	0.0112 J	ND	0.009 J	0.0141 J	0.009 J	0.01 V1, J	0.009 J	0.01 J	0.005 J	0.0078	0.00673 J	0.006 J	0.006 J	0.006 J					
Mercury	0.000135	0.002	ND	ND	ND	ND	ND	ND	ND JB	ND J	NA	ND	ND	NA	ND	ND U	<0.0005	<0.0005	<0.0005 U	<0.0005 U	0.00022 H	ND	0.0002 J	<0.0002 Y2, U	<0.0002 U					
Molybdenum	0.01745	0.1	ND	ND	ND	ND	ND	ND	ND	NA	0.00442 J	ND	ND	ND	ND	ND U	<0.01	<0.01	<0.01 U	<0.01 U	<0.00061	ND	ND U	<0.002 U	<0.002 U					
Radium 226	1.844 pCi/L	5 pCi/L	2.87	2.84	2.91	1.38	2.11	2.53	1.28	1.26	1.291	0.698	2.04	1.93	1.23	2.32	1.09	2.90	3.44	3.99	1.13	1.35	1.75	1.78	1.71	1.20				
Radium 228																	1.23													
Selenium	0.00066	0.05	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	ND	NA	NA	ND U	<0.003	<0.003	<0.003 U	<0.003 U	<0.00074	ND	ND U	<0.001 U	<0.001 U					
Thallium	0.000058	0.002	ND	ND J	ND	ND	ND	ND	ND	ND	NA	ND	ND	NA	NA	ND U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.00047	0.000372 J	ND U	0.0001 J	<0.0001 U					

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
GWPS = Groundwater Protection Standard  
ND = Not Detected at or above Method Detection Limit  
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.  
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  
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  
**BOLD** - Exceeds GWPS

NA = Not Analyzed  
pCi/L = picoCuries per Liter  
B = Compound was found in the blank and sample.  
F1 = MS and/or MSD Recovery is outside acceptance limits.  
D2 = Sample required dilution due to matrix interference  
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  
M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable  
H3 - Sample received and analyzed past holding time.



REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY  
Table A-4. MW-10 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE													DATE												
			3/30/2016	5/31/2016	8/23/2016	10/18/2016	2/9/2017	5/11/2017	8/23/2017	9/22/2017	10/11/2017	5/2/2018	4/6/2018	6/29/2018	9/26/2018	5/2/2019	10/17/2019	4/16/2020	9/24/2020	4/21/2021	9/29/2021	3/15/2022	6/7/2022	11/30/2022	6/29/2023	11/21/2023		
			Baseline Events													Assessment												
Boron	0.3676	NA	0.416	0.336	0.460	0.489	0.540	0.679	0.560	0.543	0.637	0.309	0.419	0.464	0.498	ND	0.54	0.51	0.54	0.54	0.54	0.55	0.53	0.53	0.52	0.56		
Calcium	48.11	NA	16.5	21.3	23	36	14.3	13.1	33.7	21.4	11.9	46.1	9.94	10.5	19.5	9.76	12.5	8.80	7.95	8.25	15	11.5	8.56	8.67	9.18			
Chloride	6.95	NA	31.5	26.9	28.9	31.6	29.4	29.1	32.3	29.7	25.8	4.94	26.7	27.9	26.6	25.7	21.4	21.4	21.4	20.7	18	16.7	17.8	16.2	17.2			
Fluoride	0.3622	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.255	ND	ND	0.570	0.6	0.5	0.5	0.5	0.5	0.62	0.54	0.6	0.5	0.5			
Sulfate	26.59	NA	208	135	144	152	145	168	177	226	147	16.8	129	136	114	80	58	62	52	61	41	32.3	30	25	24			
pH (Field Measurement)	8.034-6.483	NA	9.72	8.95	8.1	7.53	7.08	9.84	8.14	8.14	9.19	7.46	9.37	9.15	8.98	9.15	9.24	8.87	8.74	9.88	8.26	8.68	9.82	8.95	9.12			
Total Dissolved Solids	310.7	NA	644	532	558	602	679	763	758	763	728	271	721	673	642	568	466	436	530	514	480	439	530	428	408			
APPENDIX IV CONSTITUENTS																												
Antimony	0.0008951	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.000760	ND	ND	NA	0.000580	ND	<-0.005	<-0.005	<-0.005	<-0.005	<-0.00051	ND	ND	<-0.002	<-0.002		
Arsenic	0.003938	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00116	ND	ND	NA	0.00254	0.0022	0.0019	0.0019	0.0018	0.0017	0.0019	0.0016	0.0015	0.0015	0.0016		
Barium	0.0998	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0824	ND	ND	NA	0.100	0.077	0.093	0.084	0.089	0.096	0.13	0.126	0.129	0.14	0.165		
Beryllium	0.0005	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	<-0.0020	<-0.0020	<-0.0020	<-0.0020	<-0.0027	ND	ND	<-0.0010	<-0.0010		
Cadmium	0.00076	0.005	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	<-0.0010	<-0.0010	<-0.0010	<-0.0010	<-0.0022	ND	ND	<-0.0001	<-0.0001		
Chromium	0.00171	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00136	ND	ND	NA	0.00299	0.0006	<-0.0020	0.0006	0.0007	0.0006	0.0016	ND	ND	<-0.0006	0.0006		
Cobalt	0.00239	0.006	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00158	ND	ND	NA	0.00685	ND	<-0.004	<-0.004	<-0.004	<-0.004	0.00068	0.000419	ND	<-0.004	<-0.004		
Fluoride	0.3622	4	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.255	ND	ND	NA	0.570	0.6	0.5	0.5	0.5	0.62	0.54	0.6	0.5	0.5			
Lead	0.0064	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.000730	ND	ND	NA	0.00671	ND	<-0.002	<-0.002	<-0.002	<-0.002	0.00027	ND	ND	<-0.0005	<-0.0005		
Lithium	0.0094	0.04	0.339	0.199	0.219	0.0736	0.481	0.607	0.204	0.345	NA	ND	0.694	0.630	0.570	0.574	0.51	0.49	0.56	0.57	0.49	0.55	0.486	0.5	0.52	0.54		
Mercury	0.00135	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	0.0002	0.0002	0.0002	0.0003	0.0002	0.00019	ND	0.0003	<-0.0002	0.0002	
Molybdenum	0.01745	0.1	0.0170	0.0171	0.0141	ND	0.0119	ND	ND	ND	ND	0.00442	ND	ND	NA	0.00797	0.007	0.006	0.007	0.007	0.007	0.0065	0.00545	0.006	0.005	0.005		
Radium 226	1.844 pCi/L	5 pCi/L	0.612	ND	0.715	ND	0.422	0.287	0.619	0.391	NA	0.698	0.512	0.683	0.704	0.205	0.458	1.24	0.594	0.769	0.692	0.826	0.895	0.856	1.910	0.210		
Radium 228																	0.379											
Selenium	0.00066	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	<-0.003	<-0.003	<-0.003	<-0.003	<-0.00074	ND	ND	<-0.001	<-0.001		
Thallium	0.00058	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	ND	ND	<-0.0020	<-0.0020	<-0.0020	<-0.0020	<-0.00047	0.000667	ND	<-0.0001	<-0.0001		

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)  
GWPS = Groundwater Protection Standard  
ND = Not Detected at or above Method Detection Limit  
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.  
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  
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  
**BOLD** -Exceeds GWPS

NA = Not Analyzed  
pCi/L = picoCuries per Liter  
B = Compound was found in the blank and sample.  
F1 = MS and/or MSD Recovery is outside acceptance limits.  
D2 = Sample required dilution due to matrix interference  
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  
M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable  
H3 = Sample received and analyzed past holding time.

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY

Table A-5. MW-110 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE												
			3/29/2019	4/10/2019	10/24/2019	4/17/2020	10/1/2020	5/26/2021	10/1/2021	3/15/2022	6/7/2022	12/2/2022	6/30/2023	11/20/2023	
Characterization															
Boron	0.3676	NA	0.484 JB	0.496 JB	ND D2, U	0.54 M4	0.53 D2, M1, M4	0.54	0.52	0.60	0.537	0.53	0.51 M2	0.56 M2	
Calcium	48.11	NA	176 B	178	204 D1	181 D1, M2	162 D1, M2	163 D1	155 D1	150	143	151 D1	152 D1, M3	105 D1, M3	
Chloride	6.95	NA	26.0	30.4 B	30.0	22.1	19.9	21.8	21.1	20	19.6	2.1	17.7	17.6 M2	
Fluoride	0.3622	4	0.279 J	0.255 JB	0.3	0.3	0.3	0.3	0.3	0.36	0.326	0.3	0.3	0.3	
Sulfate	26.59	NA	563	596 B	D M1	460 D	411 D	428 D	853 D	440	450	539 D	493 D	401 D, M1	
pH (Field Measurement)	8.034-6.483	NA	7.25	7.50	6.84	7.17	7.56	7.75	6.69	7.19	6.87	7.28	7.68 H3	7.15	
Total Dissolved Solids	310.7	NA	1170	1200	1270	1150	1060	1140	1090	930	934 B	1,020	1070	824	
APPENDIX IV CONSTITUENTS															
Antimony	0.0008951	0.006	0.000240 JB	0.000204 JB	ND U	<0.005	<0.005 M4	<0.005 U	<0.005 U	<0.00051	ND	ND U	<0.002 U	<0.002 U	
Arsenic	0.003938	0.01	0.00534	0.00238 J	ND U	0.0012	0.0004 J	<0.0010 U	<0.0010 U	0.0011	0.00198 J	ND U	<0.0004 U	0.0006 J	
Barium	0.0908	2	0.118 J	0.107 JB	0.065	0.065	0.056 M1	0.055	0.049	0.059	0.0696	0.049	0.046	0.046	
Beryllium	0.0005	0.004	0.000716 J	0.000314 J	ND U	<0.0020 M2	<0.0020 M4	<0.0020 U	<0.0020 U	<0.00027	ND	ND U	<0.0010 U	<0.0010 U	
Cadmium	0.000076	0.005	ND	ND	ND U	<0.0010	<0.0010	<0.0010 U	<0.0010 U	<0.00022	ND	ND U	<0.0001 U	<0.0001 U	
Chromium	0.00171	0.1	0.0180 B	0.0115	0.0010 J	0.0047	0.0016 J	0.0009 J	<0.0020 U	0.0035	0.00729	ND U	<0.0006 U	0.0028	
Cobalt	0.00239	0.006	0.00911 B	0.00384 J	ND U	<0.004	<0.004 M4	<0.004 U	<0.004 U	0.0017	0.00359	ND U	<0.004 U	<0.004 U	
Fluoride	0.3622	4	0.279 J	0.255 JB	0.3	0.3	0.3	0.3	0.3	0.36	0.326	0.3	0.3	0.3	
Lead	0.00064	0.015	0.00661	0.00399 J	ND U	0.002	0.0008 J	<0.002 U	<0.002 U	0.0017	0.00328	ND U	<0.0005 U	0.001 J	
Lithium	0.00994	0.04	0.0299 J	0.0303 J	0.02	0.02	0.02 M4	0.02	0.02	0.0203	0.0217	0.01 J	0.01 J	0.01 J	
Mercury	0.000135	0.002	ND	ND A	ND U	0.0002 J	<0.0005 M1, M4	<0.0005 U	<0.0005 U	<0.00013 H	ND	ND U	<0.0002 U	<0.0002 M1, Y2, U	
Molybdenum	0.01745	0.1	0.00153 J	0.00120 J	ND U	<0.01	<0.01 M4	<0.01 U	<0.01 U	<0.00061	0.00123	ND U	<0.002 U	<0.002 U	
Radium 226	1.844 pCi/L	5 pCi/L	1.84	1.93	0.195	1.37	0.941	0.636	0.652	1.580	-0.901 U	1.09	1.25	0.811	
Radium 228			0.727												
Selenium	0.00066	0.05	ND	ND	ND U	<0.003	<0.003 M4	<0.003 U	<0.003 U	<0.00074	ND	ND U	<0.001 U	<0.001 U	
Thallium	0.000058	0.002	0.000112 J	0.0000640 J	ND U	<0.0020	<0.0020	<0.0020 U	<0.0020 U	<0.00047	0.000569 J	ND U	0.0002 J	<0.0001 U	

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

ND = Not Detected at or above Method Detection Limit

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.

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

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

**BOLD** -Exceeds GWPS

NA = Not Analyzed

pCi/L = picoCuries per Liter

B = Compound was found in the blank and sample.

F1 = MS and/or MSD Recovery is outside acceptance limits.

D2 = Sample required dilution due to matrix interference

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

M4 = The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable

H3 - Sample received and analyzed past holding time.

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY

Table A-6. MW-111 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE				
			3/16/2022	6/07/2022	12/02/2022	6/30/2023	11/20/2023
Characterization							
Boron	0.3676	NA	0.54	0.521	0.5	0.48	0.57
Calcium	48.11	NA	19	16.5	16	20.4	16.6
Chloride	6.95	NA	18	19.8	16.7	19.4	18.2
Fluoride	0.3622	4	0.55	0.561	0.5	0.4	0.4
Sulfate	26.59	NA	6.7	2.86	0.9	5	2
pH (Field Measurement)	8.034-6.483	NA	8.00	7.56	8.17	8.18	7.94
Total Dissolved Solids	310.7	NA	310	305	326	358	292
APPENDIX IV CONSTITUENTS							
Antimony	0.0008951	0.006	0.0018 <sup>J</sup>	ND	ND <sup>U</sup>	<0.002 <sup>U</sup>	<0.002 <sup>U</sup>
Arsenic	0.003938	0.01	0.0014	0.00106 <sup>J</sup>	0.0008 <sup>J</sup>	0.0007 <sup>J</sup>	0.0011
Barium	0.0908	2	0.89	0.798	0.848	0.89	1.03
Beryllium	0.0005	0.004	<0.00027	ND	ND <sup>U</sup>	<0.0010 <sup>U</sup>	<0.0010 <sup>U</sup>
Cadmium	0.000076	0.005	<0.00022	ND	ND <sup>U</sup>	<0.0001 <sup>U</sup>	<0.0001 <sup>U</sup>
Chromium	0.00171	0.1	<0.0015	ND	ND <sup>U</sup>	<0.0006 <sup>U</sup>	<0.0006 <sup>U</sup>
Cobalt	0.00239	0.006	0.00085	0.000236 <sup>J</sup>	ND <sup>U</sup>	<0.004 <sup>U</sup>	<0.004 <sup>U</sup>
Fluoride	0.3622	4	0.55	0.561	0.5	0.4	0.4
Lead	0.00064	0.015	0.00054 <sup>J</sup>	ND	ND <sup>U</sup>	<0.0005 <sup>U</sup>	<0.0005 <sup>U</sup>
Lithium	0.00994	0.04	0.014	0.00994	0.008 <sup>J</sup>	0.008 <sup>J</sup>	0.008 <sup>J</sup>
Mercury	0.000135	0.002	0.00031	ND	0.0002 <sup>J</sup>	<0.0002 <sup>U</sup>	<0.0002 <sup>U</sup>
Molybdenum	0.01745	0.1	0.0044 <sup>J</sup>	0.00527	0.003 <sup>J</sup>	0.003 <sup>J</sup>	0.002 <sup>J</sup>
Radium 226	1.844 pCi/L	5 pCi/L	0.67 <sup>U</sup>	0.48	1.64	1.48	1.71
Radium 228							
Selenium	0.00066	0.05	<0.00074	ND	ND <sup>U</sup>	<0.001 <sup>U</sup>	<0.001 <sup>U</sup>
Thallium	0.000058	0.002	<0.00047	ND	ND <sup>U</sup>	0.0001 <sup>J</sup>	<0.0001 <sup>U</sup>

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS - Groundwater Protection Standard

ND - Not Detected at or above Method Detection Limit

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.

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

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

**BOLD** -Exceeds GWPS

NA - Not Analyzed

pCi/L - picoCuries per Liter

B - Compound was found in the blank and sample.

F1 - MS and/or MSD Recovery is outside acceptance limits.

D2 - Sample required dilution due to matrix interference

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

M4 - The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable

H3 - Sample received and analyzed past holding time.

REID/HMPL CCR SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY

Table A-7. MW-112 (down-gradient)

APPENDIX III CONSTITUENTS	Pred. Limit	GWPS	DATE										
			3/17/2022		6/07/2022		7/26/2022		12/02/2022		6/30/2023		11/20/2023
			Characterization		Resample		Characterization		Characterization		Characterization		Characterization
Boron	0.3676	NA	0.39	0.331	NA		0.36		0.33		0.37		
Calcium	48.11	NA	29	30.7	NA		28.2	D1	30.2	D1	27.6		
Chloride	6.95	NA	8.4	9.5	NA		9.1		10.9		10.9		
Fluoride	0.3622	4	0.31	0.287	NA		0.3	M1	0.3		0.3		
Sulfate	26.59	NA	12.4	14.7	NA		12	M1	24		24		
pH (Field Measurement)	8.034-6.483	NA	7.76	7.40	NA		7.80		7.98	H3	7.50		
Total Dissolved Solids	310.7	NA	288	275	NA		330		306		278		
<b>APPENDIX IV CONSTITUENTS</b>													
Antimony	0.0008951	0.006	0.00058	J	ND	NA	ND	U	<0.002	U	<0.002		
Arsenic	0.003938	0.01	0.00089	J	0.00336	J	NA	0.0009	J	0.0014	0.0018		
Barium	0.0908	2	0.34		0.43	NA	0.316		0.319		0.331		
Beryllium	0.0005	0.004	<0.00027		0.00203	NA	ND	U	<0.0010	U	<0.0010		
Cadmium	0.000076	0.005	<0.00022		ND	NA	ND	U	<0.0001	U	<0.0001		
Chromium	0.00171	0.1	0.0024		0.0311	NA	ND	U	<0.0006	U	0.0021		
Cobalt	0.00239	0.006	0.002		0.0141	0.00297	ND	U	<0.004	U	<0.004		
Fluoride	0.3622	4	0.31		0.287	NA	0.3		0.3		0.3		
Lead	0.00064	0.015	0.001		0.013	NA	ND	U	<0.0005	U	0.0006		
Lithium	0.00994	0.04	0.011		0.0319	NA	0.007	J	0.006	J	0.007		
Mercury	0.000135	0.002	<0.00013		ND	NA	0.0003	J	<0.0002	U	<0.0002		
Molybdenum	0.01745	0.1	0.0062		0.00605	NA	0.005	J	0.005	J	0.006		
Radium 226													
Radium 228	1.844 pCi/L	5 pCi/L	0.71	U	2.56	NA	1.2		1.69		0.565		
Selenium	0.00066	0.05	<0.00074		ND	NA	ND	U	<0.001	U	<0.001		
Thallium	0.000058	0.002	<0.00047		0.000277	J	NA	ND	U	0.0001	<0.0001		

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS - Groundwater Protection Standard

ND - Not Detected at or above Method Detection Limit

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.

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U - Target analyte was analyzed for, but was below detection limit

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**BOLD** - Exceeds GWPS

NA - Not Analyzed

pCi/L - picoCuries per Liter

B - Compound was found in the blank and sample.

F1 - MS and/or MSD Recovery is outside acceptance limits.

D2 - Sample required dilution due to matrix interference

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

M4 - The analysis of the spike sample required a dilution such that the spike concentration was diluted below the reporting limit. The method control sample recovery was acceptable

H3 - Sample received and analyzed past holding time.

## **APPENDIX B**

### **Analytical Data Packages**



## Certificate of Analysis 3032611

Greg Dick  
Big Rivers Electric Corporation Reid/Green Station  
PO Box 24  
Henderson, KY 42419

Customer ID: 44-102032  
Report Printed: 07/31/2023 11:54

Project Name: HMPL Surface Impoundment

Workorder: 3032611

Dear Greg Dick

Enclosed are the analytical results for samples received by the laboratory 06/30/2023 12:44.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3032611-01	MW7/	Groundwater	06/29/2023 09:30	06/30/2023 12:44	Greg Dick
3032611-02	MW8/	Groundwater	06/29/2023 14:00	06/30/2023 12:44	Greg Dick
3032611-03	MW9/	Groundwater	06/29/2023 15:15	06/30/2023 12:44	Greg Dick
3032611-04	MW10/	Groundwater	06/29/2023 18:05	06/30/2023 12:44	Greg Dick
3032611-05	DUPLICATE/	Groundwater	06/29/2023 15:50	06/30/2023 12:44	Greg Dick
3032611-06	FIELD BLANK/	Water	06/29/2023 18:45	06/30/2023 12:44	Greg Dick

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
3032611-01	Field Conductance	456
	Field pH	6.87
	Field Temp (C)	15.85
3032611-02	Field Conductance	2560
	Field pH	6.82
	Field Temp (C)	17.92
3032611-03	Field Conductance	521
	Field pH	6.77
	Field Temp (C)	18.90
3032611-04	Field Conductance	770
	Field pH	8.73
	Field Temp (C)	17.71
3032611-05	Field Conductance	521
	Field pH	6.77
	Field Temp (C)	18.90



**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-01**  
 Description: **MW7**

Sample Collection Date Time: 06/29/2023 09:30  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Arsenic</b>	<b>0.0020</b>		mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Barium</b>	<b>0.076</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Boron</b>	<b>0.33</b>		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:16	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Calcium</b>	<b>44.1</b>	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:19	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Lithium</b>	<b>0.007</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Molybdenum</b>	<b>0.007</b>	J	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:01	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.69</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>186</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.411</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.40</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.81</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.81</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>2.6</b>		mg/L	0.5	0.4	SW846 9056	07/05/2023 22:51	07/05/2023 22:51	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 22:51	07/05/2023 22:51	CSC
<b>Sulfate</b>	<b>10</b>		mg/L	1	0.5	SW846 9056	07/05/2023 22:51	07/05/2023 22:51	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-02**  
 Description: **MW8**

Sample Collection Date Time: 06/29/2023 14:00  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:03	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
<b>Barium</b>	<b>0.015</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
<b>Boron</b>	<b>1.60</b>	D1	mg/L	1.00	1.00	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:28	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
<b>Calcium</b>	<b>276</b>	D1	mg/L	40.0	13.0	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:32	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:03	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.56</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>2030</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.676</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.50</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>2.18</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>2.18</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>48.2</b>		mg/L	0.5	0.4	SW846 9056	07/05/2023 23:18	07/05/2023 23:18	CSC
<b>Fluoride</b>	<b>0.4</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 23:18	07/05/2023 23:18	CSC
<b>Sulfate</b>	<b>1450</b>	D	mg/L	10	5	SW846 9056	07/05/2023 23:46	07/05/2023 23:46	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-03**  
 Description: **MW9**

Sample Collection Date Time: 06/29/2023 15:15  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:06	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
<b>Barium</b>	<b>0.245</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:35	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
<b>Calcium</b>	<b>62.3</b>	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:38	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Mercury	ND	y2, u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:06	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.45</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>338</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.982</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.727</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.71</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.71</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>6.1</b>		mg/L	0.5	0.4	SW846 9056	07/06/2023 00:13	07/06/2023 00:13	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	07/06/2023 00:13	07/06/2023 00:13	CSC
<b>Sulfate</b>	<b>0.5</b>	J	mg/L	1	0.5	SW846 9056	07/06/2023 00:13	07/06/2023 00:13	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-04**  
 Description: **MW10**

Sample Collection Date Time: 06/29/2023 18:05  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Arsenic</b>	<b>0.0015</b>		mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Barium</b>	<b>0.140</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Boron</b>	<b>0.52</b>		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:54	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Calcium</b>	<b>8.67</b>		mg/L	0.40	0.13	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:54	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Lithium</b>	<b>0.52</b>		mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:08	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.95</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>428</b>		mg/L	100	100	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.574</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.34</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.91</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.91</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>16.2</b>		mg/L	0.5	0.4	SW846 9056	07/06/2023 01:35	07/06/2023 01:35	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	07/06/2023 01:35	07/06/2023 01:35	CSC
<b>Sulfate</b>	<b>25</b>		mg/L	1	0.5	SW846 9056	07/06/2023 01:35	07/06/2023 01:35	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-05**  
 Description: **DUPLICATE**

Sample Collection Date Time: 06/29/2023 15:50  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:10	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
<b>Barium</b>	<b>0.252</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 14:03	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
<b>Calcium</b>	<b>61.0</b>	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 14:06	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
<b>Lithium</b>	<b>0.007</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:10	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.45</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>330</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>1.11</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.43</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>2.54</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>2.54</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>6.3</b>		mg/L	0.5	0.4	SW846 9056	07/06/2023 02:03	07/06/2023 02:03	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	07/06/2023 02:03	07/06/2023 02:03	CSC
<b>Sulfate</b>	<b>0.5</b>	J	mg/L	1	0.5	SW846 9056	07/06/2023 02:03	07/06/2023 02:03	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3032611-06**  
 Description: **FIELD BLANK**

Sample Collection Date Time: 06/29/2023 18:45  
 Sample Received Date Time: 06/30/2023 12:44

**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	07/03/2023 09:56	07/07/2023 16:13	AKB
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Boron	ND	M2, U	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 14:13	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Calcium	ND	M1, U	mg/L	0.40	0.13	SW846 6010 B	07/03/2023 09:56	07/05/2023 14:13	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB
Thallium	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 16:13	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	<b>5.84</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.171</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.468</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>0.639</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.639</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	M1, U	mg/L	0.5	0.4	SW846 9056	07/06/2023 02:58	07/06/2023 02:58	CSC
Fluoride	ND	M1, U	mg/L	0.2	0.2	SW846 9056	07/06/2023 02:58	07/06/2023 02:58	CSC
Sulfate	ND	M1, U	mg/L	1	0.5	SW846 9056	07/06/2023 02:58	07/06/2023 02:58	CSC



**Notes for work order 3032611**

- 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
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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).
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

- 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



**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
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**Batch BCG0024 - EPA 200.2**

**Blank (BCG0024-BLK1)**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:44

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U

**Blank (BCG0024-BLK2)**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 15:39

Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	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
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	0.0001	0.0020	mg/L							J

**LCS (BCG0024-BS1)**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:47

Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.32	0.40	mg/L	6.25		101	85-115			

**LCS (BCG0024-BS2)**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 15:41

Molybdenum	0.06	0.01	mg/L	0.0625		101	85-115			
Antimony	0.060	0.005	mg/L	0.0625		95.8	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		99.0	85-115			
Arsenic	0.0603	0.0010	mg/L	0.0625		96.4	85-115			
Barium	0.061	0.004	mg/L	0.0625		98.1	85-115			
Beryllium	0.0601	0.0020	mg/L	0.0625		96.2	85-115			
Cadmium	0.0601	0.0010	mg/L	0.0625		96.1	85-115			
Chromium	0.0621	0.0020	mg/L	0.0625		99.3	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		99.0	85-115			
Lead	0.060	0.002	mg/L	0.0625		96.6	85-115			
Lithium	0.06	0.02	mg/L	0.0625		96.5	85-115			
Selenium	0.058	0.003	mg/L	0.0625		92.9	85-115			
Thallium	0.0594	0.0020	mg/L	0.0625		95.1	85-115			





**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
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**Batch BCG0024 - EPA 200.2**

**Matrix Spike (BCG0024-MS1) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:09

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	160	4.00	mg/L	6.25	152	123	80-120			D2, M3

**Matrix Spike (BCG0024-MS2) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:16

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	8.40	4.00	mg/L	6.25	ND	134	80-120			D2, M1

**Matrix Spike (BCG0024-MS3) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:33

Antimony	0.062	0.005	mg/L	0.0625	ND	99.5	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	109	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120			
Arsenic	0.0631	0.0010	mg/L	0.0625	ND	101	80-120			
Barium	0.108	0.004	mg/L	0.0625	0.046	98.7	80-120			
Beryllium	0.0573	0.0020	mg/L	0.0625	ND	91.7	80-120			
Cadmium	0.0603	0.0010	mg/L	0.0625	ND	96.5	80-120			
Chromium	0.0617	0.0020	mg/L	0.0625	ND	98.7	80-120			
Cobalt	0.060	0.004	mg/L	0.0625	ND	96.7	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	95.3	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.01	91.3	80-120			
Selenium	0.059	0.003	mg/L	0.0625	ND	93.6	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.2	80-120			

**Matrix Spike (BCG0024-MS4) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:37

Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Mercury	0.0029	0.0005	mg/L	0.00250	ND	118	80-120			
Antimony	0.061	0.005	mg/L	0.0625	ND	98.1	80-120			
Arsenic	0.0625	0.0010	mg/L	0.0625	ND	100	80-120			
Barium	0.063	0.004	mg/L	0.0625	ND	100	80-120			
Beryllium	0.0617	0.0020	mg/L	0.0625	ND	98.8	80-120			
Cadmium	0.0617	0.0010	mg/L	0.0625	ND	98.8	80-120			
Chromium	0.0638	0.0020	mg/L	0.0625	ND	102	80-120			
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120			
Lead	0.063	0.002	mg/L	0.0625	ND	101	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	102	80-120			
Selenium	0.060	0.003	mg/L	0.0625	ND	95.5	80-120			
Thallium	0.0634	0.0020	mg/L	0.0625	0.0001	101	80-120			



**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
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**Batch BCG0024 - EPA 200.2**

**Matrix Spike Dup (BCG0024-MSD1) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:13

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	165	4.00	mg/L	6.25	152	214	80-120	3.48	20	D2, M3

**Matrix Spike Dup (BCG0024-MSD2) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:19

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	7.31	4.00	mg/L	6.25	ND	117	80-120	13.9	20	D2

**Matrix Spike Dup (BCG0024-MSD3) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:35

Antimony	0.064	0.005	mg/L	0.0625	ND	102	80-120	2.64	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	0.103	20	
Mercury	0.0028	0.0005	mg/L	0.00250	ND	112	80-120	3.47	20	
Arsenic	0.0635	0.0010	mg/L	0.0625	ND	102	80-120	0.580	20	
Barium	0.108	0.004	mg/L	0.0625	0.046	98.2	80-120	0.261	20	
Beryllium	0.0571	0.0020	mg/L	0.0625	ND	91.3	80-120	0.414	20	
Cadmium	0.0606	0.0010	mg/L	0.0625	ND	97.0	80-120	0.585	20	
Chromium	0.0619	0.0020	mg/L	0.0625	ND	99.1	80-120	0.430	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.5	80-120	0.791	20	
Lead	0.060	0.002	mg/L	0.0625	ND	95.4	80-120	0.102	20	
Lithium	0.07	0.02	mg/L	0.0625	0.01	92.0	80-120	0.655	20	
Selenium	0.059	0.003	mg/L	0.0625	ND	94.8	80-120	1.21	20	
Thallium	0.0594	0.0020	mg/L	0.0625	0.0002	94.8	80-120	0.465	20	

**Matrix Spike Dup (BCG0024-MSD4) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:40

Mercury	2.92		ug/L	2.50	0.0510	115	80-120	200	20	Y2
Antimony	0.060	0.005	mg/L	0.0625	ND	96.3	80-120	1.85	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	80-120	3.80	20	
Arsenic	0.0599	0.0010	mg/L	0.0625	ND	95.8	80-120	4.30	20	
Barium	0.061	0.004	mg/L	0.0625	ND	97.3	80-120	2.97	20	
Beryllium	0.0599	0.0020	mg/L	0.0625	ND	95.8	80-120	3.03	20	
Cadmium	0.0602	0.0010	mg/L	0.0625	ND	96.3	80-120	2.59	20	
Chromium	0.0612	0.0020	mg/L	0.0625	ND	97.9	80-120	4.18	20	
Cobalt	0.062	0.004	mg/L	0.0625	ND	98.5	80-120	5.15	20	
Lead	0.061	0.002	mg/L	0.0625	ND	97.7	80-120	3.57	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	96.7	80-120	5.28	20	
Selenium	0.058	0.003	mg/L	0.0625	ND	92.3	80-120	3.43	20	
Thallium	0.0610	0.0020	mg/L	0.0625	0.0001	97.3	80-120	3.86	20	



**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
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**Batch BCG0024 - EPA 200.2**

**Post Spike (BCG0024-PS1) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:22

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	173	4.00	mg/L	6.25	152	340	75-125			D2, M3

**Post Spike (BCG0024-PS2) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:42

Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	75-125			
Mercury	0.0028	0.0005	mg/L	0.00250	ND	111	75-125			
Antimony	0.062	0.005	mg/L	0.0625	ND	99.9	75-125			
Arsenic	0.0633	0.0010	mg/L	0.0625	ND	101	75-125			
Barium	0.106	0.004	mg/L	0.0625	0.046	95.5	75-125			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	75-125			
Cadmium	0.0609	0.0010	mg/L	0.0625	ND	97.5	75-125			
Chromium	0.0618	0.0020	mg/L	0.0625	ND	98.8	75-125			
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.1	75-125			
Lead	0.059	0.002	mg/L	0.0625	ND	94.2	75-115			
Lithium	0.07	0.02	mg/L	0.0625	0.01	91.0	75-125			
Selenium	0.060	0.003	mg/L	0.0625	ND	95.6	75-125			
Thallium	0.0593	0.0020	mg/L	0.0625	0.0002	94.5	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCF2697 - Default Prep Micro</b>										
<b>LCS (BCF2697-BS1)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.96		Std. Units	5.00		99.2	98.8-101.2			
<b>LCS (BCF2697-BS2)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.99		Std. Units	5.00		99.8	98.8-101.2			
<b>Duplicate (BCF2697-DUP1) Source: 3032611-06</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	5.79	0.10	Std. Units		5.84			0.860	10	H3
<b>Duplicate (BCF2697-DUP2) Source: 3064450-01</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	9.64	0.10	Std. Units		9.64			0.00	10	H3
<b>Batch BCF2838 - Default Prep Wet Chem</b>										
<b>Blank (BCF2838-BLK1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCF2838-BS1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1490	25	mg/L	1500		99.4	80-120			
<b>Duplicate (BCF2838-DUP1) Source: 3032610-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1040	100	mg/L		1070			3.03	10	
<b>Duplicate (BCF2838-DUP2) Source: 3063392-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	7800	100	mg/L		7780			0.205	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0128 - Default Prep IC**

**Matrix Spike (BCG0128-MS1) Source: 3032611-06**

Prepared: 7/6/2023 3:25, Analyzed: 7/6/2023 3:25

Chloride	17.1		mg/L	12.5	0.0	137	75-125			M1
Fluoride	7.4		mg/L	5.00	0.0	147	75-125			M1
Sulfate	36		mg/L	25.0	0.4	144	75-125			M1

**Matrix Spike Dup (BCG0128-MSD1) Source: 3032611-06**

Prepared: 7/6/2023 3:52, Analyzed: 7/6/2023 3:52

Fluoride	6.6		mg/L	5.00	0.0	131	75-125	11.4	15	M1
Chloride	15.5		mg/L	12.5	0.0	124	75-125	9.67	15	
Sulfate	32		mg/L	25.0	0.4	128	75-125	11.3	15	M1

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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
<b>4500-H+ B-2000 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)

<b>Sample Acceptance Checklist for Work Order 3032611</b>	
Shipped By: Client	Temperature: 5.60° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
3032611	(mm/dd/yy):	Time (24 hr):					
3032611-01 A	<u>06/29/23</u>	<u>0930</u>	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020

Preservation Check: pH:

3032611-01 B	<u>06/29/23</u>	<u>0930</u>	Plastic 1L	1	MW7	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
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3032611-01 C	<u>06/29/23</u>	<u>0930</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)
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Preservation Check: pH:

3032611-01 D	<u>06/29/23</u>	<u>0930</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
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Preservation Check: pH:

3032611-01 E	<u>06/29/23</u>	<u>0930</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
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Preservation Check: pH:

Thermometer Serial Number

181390287

181460057

Temp 56 °C

Preservation Check Performed by: KED

Field data collected by: <u>Greg Dick</u>	Date (mm/dd/yy) <u>06/29/23</u>	Time (24 hr) <u>0930</u>
pH <u>6.87</u>	Cond (umho) <u>456</u>	Res Cl (mg/L) _____
Temp (oC) <u>15.85</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Total Cl (mg/L) _____		Free Cl (mg/L) _____
DO (mg/L) _____		Turb. (NTU) _____

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>KED</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1244</u>
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# Chain of Custody

Scheduled for: **03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): Greg Dick  
\*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 06/29/23 Start time 1400 End Date 06/29/23 End Time 1400 Temp (oC) 17.92  
Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-01 F	<u>06/29/23</u>	<u>0930</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032611-02 A	<u>06/29/23</u>	<u>1400</u>	Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032611-02 B	<u>06/29/23</u>	<u>1400</u>	Plastic 1L	1	MW8	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032611-02 C	<u>06/29/23</u>	<u>1400</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032611-02 D	<u>06/29/23</u>	<u>1400</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: LCED

Field data collected by: Greg Dick Date (mm/dd/yy) 06/29/23 Time (24 hr) 1400  
pH 6.82 Cond (umho) 2560 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 17.92 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Greg Dick Received by: (Signature) LCED Date (mm/dd/yy) 06/30/23 Time (24 hr) 1244



# Chain of Custody

Scheduled for: **03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: -  
Quote# -

Please Print Legibly

Collected by (Signature): My Dick

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date 06/29/23 Start time 1400 End Date N/A End Time N/A Temp (oC)           
Effluent: Start Date          Start time          End Date          End Time          Temp (oC)         

**LAB USE ONLY**

\*required information\*

Workorder # 3032611 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-02'E	<u>06/29/23</u>	<u>1400</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-02 F	<u>06/29/23</u>	<u>1400</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW8	g / c	Radium Total (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-03 A	<u>06/29/23</u>	<u>1515</u>	Plastic 500mL pH<2 w/HNO3	1	MW9	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-03 B	<u>06/29/23</u>	<u>1515</u>	Plastic 1L	1	MW9	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032611-03 C	<u>06/29/23</u>	<u>1515</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW9	g / c	Radium 226 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							

Preservation Check Performed by: KED

Field data collected by: Greg Dick My Dick Date (mm/dd/yy) 06/29/23 Time (24 hr) 1515  
pH 6.77 Cond (umho) 521 Res Cl (mg/L)          Tot Cl (mg/L)          Free Cl (mg/L)           
Temp (oC) 18.90 or (oF)          Static Water Level          DO (mg/L)          Turb. (NTU)           
Flow (MGD)          or (CFS)          or (g/min)         

Relinquished by: (Signature) <u>My Dick</u>	Received by: (Signature) <u>KED</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1244</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: ky

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Greg Dick*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date ← Start time N/A Date N/A End Time → Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3032611 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-03 D	<u>06/29/23</u>	<u>1515</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-03 E	<u>06/29/23</u>	<u>1515</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-03 F	<u>06/29/23</u>	<u>1515</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW9	g / c	Radium Total (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-04 A	<u>06/29/23</u>	<u>1805</u>	Plastic 500mL pH<2 w/HNO3	1	MW10	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-04 B	<u>06/29/23</u>	<u>1805</u>	Plastic 1L	1	MW10	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056

Preservation Check Performed by: *KED*

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_  
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)

*Greg Dick*

*KED*

06/30/23

1244

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3032611 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-04 C	<u>06/29/23</u>	<u>1805</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-04 D	<u>06/29/23</u>	<u>1805</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-04 E	<u>06/29/23</u>	<u>1805</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-04 F	<u>06/29/23</u>	<u>1805</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW10	g / c	Radium Total (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							

Preservation Check Performed by: ICED

Field data collected by: Greg Dick Greg Dick Date (mm/dd/yy) 06/29/23 Time (24 hr) 1805

pH 8.73 Cond (umho) 770 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 17.71 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>ICED</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1245</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature] *\*required information\**

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

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**

*\*required information\**

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-05 A	<u>06/28/23</u>	<u>1550</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-05 B	<u>06/28/23</u>	<u>1550</u>	Plastic 1L	1	DUPLICATE	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056 Radium 226 (sub)
3032611-05 C	<u>06/28/23</u>	<u>1550</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-05 D	<u>06/29/23</u>	<u>1550</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							
3032611-05 E	<u>06/29/23</u>	<u>1550</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
Preservation Check: pH : <input checked="" type="checkbox"/>							

Preservation Check Performed by: KED

Field data collected by: Greg Dick [Signature] Date (mm/dd/yy) 06/29/23 Time (24 hr) 1550

pH 6.77 Cond (umho) 521 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 18.90 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1245</u>
--	--	------------------------------------	-----------------------------

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

Greg Dick  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): [Signature]  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3032611 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-05 F	<u>06/29/23</u>	<u>1550</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3032611-06 A	<u>06/29/23</u>	<u>1845</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3032611-06 B	<u>06/29/23</u>	<u>1845</u>	Plastic 1L	1	FIELD BLANK	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032611-06 C	<u>06/29/23</u>	<u>1845</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3032611-06 D	<u>06/29/23</u>	<u>1845</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				

Preservation Check Performed by: ICED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) <u>[Signature]</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1245</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

**Please Print Legibly**

Collected by (Signature): *[Signature]*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date 6/11 End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # 3032611 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032611-06 E	<u>06/29/23</u>	<u>1845</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				
3032611-06 F	<u>06/29/23</u>	<u>1845</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			Preservation Check: pH : <input checked="" type="checkbox"/>				

Preservation Check Performed by: KED

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		DO (mg/L) _____
		Turb. (NTU) _____
		Free Cl (mg/L) _____

Relinquished by: (Signature) <u><i>[Signature]</i></u>	Received by: (Signature) <u><i>[Signature]</i></u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1245</u>
_____	_____	_____	_____
_____	_____	_____	_____



July 25, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3032611  
Pace Project No.: 30602389

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 2023. 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,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 3032611  
 Pace Project No.: 30602389

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3032611  
Pace Project No.: 30602389

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30602389001	3032611-01	Water	06/29/23 09:30	07/06/23 10:00
30602389002	3032611-02	Water	06/29/23 14:00	07/06/23 10:00
30602389003	3032611-03	Water	06/29/23 15:15	07/06/23 10:00
30602389004	3032611-04	Water	06/29/23 18:05	07/06/23 10:00
30602389005	3032611-05	Water	06/29/23 15:50	07/06/23 10:00
30602389006	3032611-06	Water	06/29/23 18:45	07/06/23 10:00
30602389007	3032611-06 (MS)	Water	06/29/23 18:45	07/06/23 10:00
30602389008	3032611-06 (MSD)	Water	06/29/23 18:45	07/06/23 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3032611  
 Pace Project No.: 30602389

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30602389001	3032611-01	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389002	3032611-02	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389003	3032611-03	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389004	3032611-04	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389005	3032611-05	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389006	3032611-06	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602389007	3032611-06 (MS)	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
30602389008	3032611-06 (MSD)	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3032611  
 Pace Project No.: 30602389

**Sample: 3032611-01** Lab ID: **30602389001** Collected: 06/29/23 09:30 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.411 ± 0.529 (0.881)</b> C:NA T:89%	pCi/L	07/20/23 14:16	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.40 ± 0.527 (0.794)</b> C:74% T:84%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.81 ± 1.06 (1.68)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032611-02** Lab ID: **30602389002** Collected: 06/29/23 14:00 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.676 ± 0.558 (0.806)</b> C:NA T:89%	pCi/L	07/20/23 14:30	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.50 ± 0.500 (0.688)</b> C:81% T:89%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.18 ± 1.06 (1.49)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032611-03** Lab ID: **30602389003** Collected: 06/29/23 15:15 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.982 ± 0.698 (1.01)</b> C:NA T:94%	pCi/L	07/20/23 14:30	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.727 ± 0.430 (0.806)</b> C:80% T:86%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.71 ± 1.13 (1.82)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3032611  
 Pace Project No.: 30602389

**Sample: 3032611-04** Lab ID: 30602389004 Collected: 06/29/23 18:05 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.574 ± 0.426 (0.533)</b> C:NA T:97%	pCi/L	07/20/23 14:30	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.34 ± 0.506 (0.773)</b> C:78% T:85%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.91 ± 0.932 (1.31)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032611-05** Lab ID: 30602389005 Collected: 06/29/23 15:50 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>1.11 ± 0.513 (0.389)</b> C:NA T:93%	pCi/L	07/20/23 14:30	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.43 ± 0.516 (0.769)</b> C:82% T:84%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.54 ± 1.03 (1.16)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032611-06** Lab ID: 30602389006 Collected: 06/29/23 18:45 Received: 07/06/23 10:00 Matrix: Water  
 PWS: Site ID: Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.171 ± 0.207 (0.315)</b> C:NA T:89%	pCi/L	07/24/23 12:33	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.468 ± 0.380 (0.763)</b> C:79% T:89%	pCi/L	07/17/23 12:38	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.639 ± 0.587 (1.08)</b>	pCi/L	07/25/23 11:19	7440-14-4	

**REPORT OF LABORATORY ANALYSIS**

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: 3032611  
 Pace Project No.: 30602389

**Sample: 3032611-06 (MS)**      **Lab ID: 30602389007**      Collected: 06/29/23 18:45      Received: 07/06/23 10:00      Matrix: Water  
 PWS:      Site ID:      Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>109.09 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	07/24/23 12:33	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>139.10 %REC ± NA (NA)</b> <b>C:NA% T:NA%</b>	pCi/L	07/17/23 12:38	15262-20-1	

**Sample: 3032611-06 (MSD)**      **Lab ID: 30602389008**      Collected: 06/29/23 18:45      Received: 07/06/23 10:00      Matrix: Water  
 PWS:      Site ID:      Sample Type:  
 Comments: • Collection date and time on sample containers does not match COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>95.08 %REC 13.72RPD ±</b> <b>NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	07/24/23 12:33	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>106.57 %REC 26.48RPD ±</b> <b>NA (NA)</b> <b>C:NA% T:NA%</b>	pCi/L	07/17/23 12:38	15262-20-1	

**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 3032611  
Pace Project No.: 30602389

---

QC Batch: 600244 Analysis Method: EPA 904.0  
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228  
Laboratory: Pace Analytical Services - Greensburg  
Associated Lab Samples: 30602389001, 30602389002, 30602389003, 30602389004, 30602389005

---

METHOD BLANK: 2917653 Matrix: Water  
Associated Lab Samples: 30602389001, 30602389002, 30602389003, 30602389004, 30602389005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.322 (0.624) C:84% T:78%	pCi/L	07/19/23 11:27	

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: 3032611  
Pace Project No.: 30602389

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QC Batch: 600243 Analysis Method: EPA 903.1  
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226  
Laboratory: Pace Analytical Services - Greensburg  
Associated Lab Samples: 30602389001, 30602389002, 30602389003, 30602389004, 30602389005

---

METHOD BLANK: 2917652 Matrix: Water  
Associated Lab Samples: 30602389001, 30602389002, 30602389003, 30602389004, 30602389005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.237 (0.382) C:NA T:84%	pCi/L	07/20/23 14:16	

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: 3032611  
 Pace Project No.: 30602389

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QC Batch: 600629 Analysis Method: EPA 904.0  
 QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228  
 Laboratory: Pace Analytical Services - Greensburg  
 Associated Lab Samples: 30602389006, 30602389007, 30602389008

---

METHOD BLANK: 2919000 Matrix: Water  
 Associated Lab Samples: 30602389006, 30602389007, 30602389008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.502 ± 0.356 (0.692) C:78% T:90%	pCi/L	07/17/23 12:38	

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: 3032611  
 Pace Project No.: 30602389

---

QC Batch: 600628	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30602389006, 30602389007, 30602389008

---

METHOD BLANK: 2918998 Matrix: Water  
 Associated Lab Samples: 30602389006, 30602389007, 30602389008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0871 ± 0.209 (0.404) C:NA T:90%	pCi/L	07/24/23 12:33	

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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## QUALIFIERS

Project: 3032611  
Pace Project No.: 30602389

---

### 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.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 3032611  
 Pace Project No.: 30602389

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30602389001	3032611-01	EPA 903.1	600243		
30602389002	3032611-02	EPA 903.1	600243		
30602389003	3032611-03	EPA 903.1	600243		
30602389004	3032611-04	EPA 903.1	600243		
30602389005	3032611-05	EPA 903.1	600243		
30602389006	3032611-06	EPA 903.1	600628		
30602389007	3032611-06 (MS)	EPA 903.1	600628		
30602389008	3032611-06 (MSD)	EPA 903.1	600628		
30602389001	3032611-01	EPA 904.0	600244		
30602389002	3032611-02	EPA 904.0	600244		
30602389003	3032611-03	EPA 904.0	600244		
30602389004	3032611-04	EPA 904.0	600244		
30602389005	3032611-05	EPA 904.0	600244		
30602389006	3032611-06	EPA 904.0	600629		
30602389007	3032611-06 (MS)	EPA 904.0	600629		
30602389008	3032611-06 (MSD)	EPA 904.0	600629		
30602389001	3032611-01	Total Radium Calculation	603591		
30602389002	3032611-02	Total Radium Calculation	603591		
30602389003	3032611-03	Total Radium Calculation	603591		
30602389004	3032611-04	Total Radium Calculation	603591		
30602389005	3032611-05	Total Radium Calculation	603591		
30602389006	3032611-06	Total Radium Calculation	603919		

**REPORT OF LABORATORY ANALYSIS**

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Chain of Custody

Workorder: 3032611      Workorder Name: HMPL Surface Impoundme      Owner Received Date: 6/30/2023      Results Requested By: Standard

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			Radium 226	Radium 228	Radium Total	LAB USE ONLY
1									X	X		001
2	3032611-01		06/29/23 09:30	IR44-McCoy	Water				X	X		002
3	3032611-02		06/29/23 14:00	IR44-McCoy	Water				X	X		003
4	3032611-03		06/29/23 15:15	IR44-McCoy	Water				X	X		004
5	3032611-04		06/29/23 18:05	IR44-McCoy	Water				X	X		005
6	3032611-05		06/29/23 15:50	IR44-McCoy	Water				X	X		006
7	3032611-06		06/29/23 18:45	IR44-McCoy	Water				X	X		
8												
9												
10												

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	Kayla Zachary		<i>Kayla Zachary</i>	6/29/23 11:00	
2				7/6/23	
3					

Cooler Temperature on Receipt 3.1 °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.

Friday, June 17, 2016 11:01:34 AM      **WO#: 30602389**      FMT-ALL-C-002rev.00 24March2009      Page 1 of 1

30602389

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3032611**

**WO# : 30602389**

**PM: SMB Due Date: 07/27/23**  
**CLIENT: PACE\_44\_MVKY**

**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
<b>Sample ID: 3032611-01</b>	<b>Water</b>	<b>Sampled:06/29/2023 09:30</b>	<b>Specific Method</b>
Radium 228 (sub)	12/26/2023 09:30	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/26/2023 09:30	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/26/2023 09:30	EPA 903.1	
<b>Sample ID: 3032611-02</b>	<b>Water</b>	<b>Sampled:06/29/2023 14:00</b>	<b>Specific Method</b>
Radium 226 (sub)	12/26/2023 14:00	EPA 903.1	
Radium 228 (sub)	12/26/2023 14:00	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/26/2023 14:00	EPA 904.0 Radium Sum C	
<b>Sample ID: 3032611-03</b>	<b>Water</b>	<b>Sampled:06/29/2023 15:15</b>	<b>Specific Method</b>
Radium Total (sub)	12/26/2023 15:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/26/2023 15:15	EPA 903.1	
Radium 228 (sub)	12/26/2023 15:15	EPA 904.0 Radium Sum C	
<b>Sample ID: 3032611-04</b>	<b>Water</b>	<b>Sampled:06/29/2023 18:05</b>	<b>Specific Method</b>
Radium 228 (sub)	12/26/2023 18:05	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/26/2023 18:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/26/2023 18:05	EPA 903.1	
<b>Sample ID: 3032611-05</b>	<b>Water</b>	<b>Sampled:06/29/2023 15:50</b>	<b>Specific Method</b>
Radium 226 (sub)	12/26/2023 15:50	EPA 903.1	
Radium 228 (sub)	12/26/2023 15:50	EPA 904.0 Radium Sum C	
Radium Total (sub)	12/26/2023 15:50	EPA 904.0 Radium Sum C	

*Ray Aldear* 7-6-23 10:00

Released By	Date	Received By	Date



**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3032611**


Analysis	Expires	Laboratory ID	Comments
<b>Sample ID: 3032611-06</b>	<b>Water</b>	<b>Sampled:06/29/2023 18:45</b>	<b>Specific Method</b>
Radium Total (sub)	12/26/2023 18:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/26/2023 18:45	EPA 903.1	
Radium 228 (sub)	12/26/2023 18:45	EPA 904.0 Radium Sum C	

**WO# : 30602389**

**PM: SMB      Due Date: 07/27/23**  
**CLIENT: PACE\_44\_MVKY**

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By *Lrey Alexander* Date *7-6-23 10:00*

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_


**DC#\_Title: ENV-FRM-GBUR-0088 v05\_Sample Condition Usage Receipt**  
**Pittsburgh**  
**WO#: 30602389**  
 Effective Date: 07/06/2023  
 PM: SMB Due Date: 07/27/23  
 CLIENT: PACE\_44\_MVKY

Client Name: Pace Madisonville

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other Initial / Date

Tracking Number: 1Z067Y5701406591981; 1Z067Y5701429011981

Examined By: TH 7/12/23  
 Labeled By: TH 7/12/23  
 Temped By: TH 7/12/23

Custody Seal on Cooler/Box Present:  Yes  No  
 Thermometer Used: 16 Type of Ice:  Wet  Blue  None  
 Seals Intact:  Yes  No

Cooler Temperature: Observed Temp 3.1 °C Correction Factor: 0 °C Final Temp: 3.1 °C  
 Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot# <u>100324</u>	D.P.D. Residual Chlorine Lot # <u>        </u>
Chain of Custody Present	<input checked="" type="checkbox"/>				
Chain of Custody Filled Out: -Were client corrections present on COC	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>			
Chain of Custody Relinquished	<input checked="" type="checkbox"/>				
Sampler Name & Signature on COC:		<input checked="" type="checkbox"/>			
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>		<input checked="" type="checkbox"/>			
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>				
Short Hold Time Analysis (<72hr remaining):		<input checked="" type="checkbox"/>			
Rush Turn Around Time Requested:		<input checked="" type="checkbox"/>			
Sufficient Volume:	<input checked="" type="checkbox"/>				
Correct Containers Used: -Pace Containers Used	<input checked="" type="checkbox"/>				
Containers Intact:	<input checked="" type="checkbox"/>				
Orthophosphate field filtered:			<input checked="" type="checkbox"/>		
Hex Cr Aqueous samples field filtered:			<input checked="" type="checkbox"/>		
Organic Samples checked for dechlorination			<input checked="" type="checkbox"/>		
Filtered volume received for dissolved tests:	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>		
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix					
All containers meet method preservation requirements:	<input checked="" type="checkbox"/>			Initial when completed <u>TH</u>	Date/Time of Preservation
				Lot# of added Preservative	
8260C/D: Headspace in VOA Vials (> 6mm)			<input checked="" type="checkbox"/>		
624.1: Headspace in VOA Vials (0mm)			<input checked="" type="checkbox"/>		
Trip Blank Present:			<input checked="" type="checkbox"/>		Trip blank custody seal present? YES or NO
Rad Samples Screened <0.5 mrem/hr.	<input checked="" type="checkbox"/>			Initial when completed <u>TH</u>	Date: <u>7/6/23</u> Survey Meter SN: <u>1563</u>
Comments:					

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Client

Site

3032611

Page 1 of 1

Profile Number

11851

Notes

Sample Line Item	Matrix	Amber Glass						Plastic						Vials						Other													
		AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WG9U	WG9T	WG9U	ZPLC	GCUB	GJN	12GN	GN	BG1U					
1	WT																																
2																																	
3																																	
4																																	
5																																	
6																																	

Container Codes

Glass

GJN	1 Gallon Jug with HNO3	DG9S	40mL amber VOA vial H2SO4
AG5U	100mL amber glass unpreserved	VG9U	40mL clear VOA vial
AG5T	100mL amber glass Na Thiosulfate	VG9T	40mL clear VOA vial Na Thiosulfate
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
BS	250mL amber glass H2SO4	WGKU	8oz wide jar unpreserved
BU	250mL amber glass unpreserved	GN	General

WO#: 30602389

PM: SMB Due Date: 07/27/23

CLIENT: PACE\_44\_MVKY

Qualtrax ID: 55678

Plastic/Misc.

GCUB	1 gallon cubitainer	EZI	5g Encore
12GN	1/2 gallon cubitainer	VOAK	Kit Volatile Solid
SP5T	120mL colliform Na Thiosulfate	I	Wipe/Swab
BP1N	1L plastic HNO3	ZPLC	Siploc Bag
BP1U	1L plastic unpreserved	WT	Water
BP3S	250mL plastic H2SO4	SL	Solid
BP3N	250mL plastic HNO3	OL	Non-Aq Liquid
BP3U	250mL plastic unpreserved	WP	Wipe
BP3C	250mL plastic NAOH		
BP3S	250mL plastic H2SO4		



## Certificate of Analysis 3032610

Greg Dick  
Big Rivers Electric Corporation Reid/Green Station  
PO Box 24  
Henderson, KY 42419

Customer ID: 44-102032  
Report Printed: 07/31/2023 11:56

Project Name: HMPL Surface Impoundment Characterization Wells	Workorder: 3032610
---	--------------------

Dear Greg Dick

Enclosed are the analytical results for samples received by the laboratory 06/30/2023 12:50.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3032610-01	MW-110/	Groundwater	06/30/2023 08:25	06/30/2023 12:50	Greg Dick
3032610-02	MW-111/	Groundwater	06/30/2023 09:25	06/30/2023 12:50	Greg Dick
3032610-03	MW-112/	Groundwater	06/30/2023 10:25	06/30/2023 12:50	Greg Dick
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
3032610-01	Field Conductance	1290			
	Field pH	6.75			
	Field Temp (C)	17.70			
3032610-02	Field Conductance	531			
	Field pH	7.49			
	Field Temp (C)	18.79			
3032610-03	Field Conductance	530			
	Field pH	7.38			
	Field Temp (C)	18.51			



**ANALYTICAL RESULTS**

Lab Sample ID: **3032610-01**  
 Description: **MW-110**

Sample Collection Date Time: 06/30/2023 08:25  
 Sample Received Date Time: 06/30/2023 12:50

**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	07/03/2023 09:56	07/07/2023 15:43	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
<b>Barium</b>	<b>0.046</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
<b>Boron</b>	<b>0.51</b>	M2	mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 12:38	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
<b>Calcium</b>	<b>152</b>	D1, M3	mg/L	40.0	13.0	SW846 6010 B	07/03/2023 09:56	07/05/2023 12:44	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
<b>Lithium</b>	<b>0.01</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB
<b>Thallium</b>	<b>0.0002</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:43	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.68</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>1070</b>		mg/L	100	100	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.590</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.657</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.25</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.25</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>17.7</b>		mg/L	0.5	0.4	SW846 9056	07/05/2023 20:06	07/05/2023 20:06	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 20:06	07/05/2023 20:06	CSC
<b>Sulfate</b>	<b>493</b>	D	mg/L	5	2	SW846 9056	07/05/2023 20:34	07/05/2023 20:34	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3032610-02**  
 Description: **MW-111**

Sample Collection Date Time: 06/30/2023 09:25  
 Sample Received Date Time: 06/30/2023 12:50

**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	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Arsenic</b>	<b>0.0007</b>	J	mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Barium</b>	<b>0.890</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Boron</b>	<b>0.48</b>		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 12:47	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Calcium</b>	<b>20.4</b>	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 12:50	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Lithium</b>	<b>0.008</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:46	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.18</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>358</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.719</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.760</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.48</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.48</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>19.4</b>		mg/L	0.5	0.4	SW846 9056	07/05/2023 21:01	07/05/2023 21:01	CSC
<b>Fluoride</b>	<b>0.4</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 21:01	07/05/2023 21:01	CSC
<b>Sulfate</b>	<b>5</b>		mg/L	1	0.5	SW846 9056	07/05/2023 21:01	07/05/2023 21:01	CSC





**ANALYTICAL RESULTS**

Lab Sample ID: **3032610-03**  
 Description: **MW-112**

Sample Collection Date Time: 06/30/2023 10:25  
 Sample Received Date Time: 06/30/2023 12:50

**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	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Arsenic</b>	<b>0.0014</b>		mg/L	0.0010	0.0004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Barium</b>	<b>0.319</b>		mg/L	0.004	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Boron</b>	<b>0.33</b>		mg/L	0.10	0.10	SW846 6010 B	07/03/2023 09:56	07/05/2023 12:57	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Calcium</b>	<b>30.2</b>	D1	mg/L	4.00	1.30	SW846 6010 B	07/03/2023 09:56	07/05/2023 13:00	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB
<b>Thallium</b>	<b>0.0001</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	07/03/2023 09:56	07/07/2023 15:48	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.98</b>	H3	Std. Units	0.10	0.10	4500-H+ B-2000	07/05/2023 13:07	07/05/2023 14:27	AED
<b>Total Dissolved Solids</b>	<b>306</b>		mg/L	50	50	2540 C-2015	06/30/2023 16:45	06/30/2023 16:45	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.474</b>	_Sub	pCi/L			EPA 903.1	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.22</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>Radium</b>	<b>1.69</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.69</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	07/31/2023 10:47	07/31/2023 10:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>10.9</b>		mg/L	0.5	0.4	SW846 9056	07/05/2023 21:56	07/05/2023 21:56	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	07/05/2023 21:56	07/05/2023 21:56	CSC
<b>Sulfate</b>	<b>24</b>		mg/L	1	0.5	SW846 9056	07/05/2023 21:56	07/05/2023 21:56	CSC



**Notes for work order 3032610**

- 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
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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).
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

- 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



**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
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**Batch BCG0024 - EPA 200.2**

**Blank (BCG0024-BLK1)**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:44

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U

**Blank (BCG0024-BLK2)**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 15:39

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
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	0.0001	0.0020	mg/L							J

**LCS (BCG0024-BS1)**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 10:47

Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.32	0.40	mg/L	6.25		101	85-115			

**LCS (BCG0024-BS2)**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 15:41

Antimony	0.060	0.005	mg/L	0.0625		95.8	85-115			
Molybdenum	0.06	0.01	mg/L	0.0625		101	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		99.0	85-115			
Arsenic	0.0603	0.0010	mg/L	0.0625		96.4	85-115			
Barium	0.061	0.004	mg/L	0.0625		98.1	85-115			
Beryllium	0.0601	0.0020	mg/L	0.0625		96.2	85-115			
Cadmium	0.0601	0.0010	mg/L	0.0625		96.1	85-115			
Chromium	0.0621	0.0020	mg/L	0.0625		99.3	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		99.0	85-115			
Lead	0.060	0.002	mg/L	0.0625		96.6	85-115			
Lithium	0.06	0.02	mg/L	0.0625		96.5	85-115			
Selenium	0.058	0.003	mg/L	0.0625		92.9	85-115			
Thallium	0.0594	0.0020	mg/L	0.0625		95.1	85-115			



**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
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**Batch BCG0024 - EPA 200.2**

**Matrix Spike (BCG0024-MS1) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:09

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	160	4.00	mg/L	6.25	152	123	80-120			D2, M3

**Matrix Spike (BCG0024-MS2) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:16

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	8.40	4.00	mg/L	6.25	ND	134	80-120			D2, M1

**Matrix Spike (BCG0024-MS3) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:33

Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120			
Mercury	0.0027	0.0005	mg/L	0.00250	ND	109	80-120			
Antimony	0.062	0.005	mg/L	0.0625	ND	99.5	80-120			
Arsenic	0.0631	0.0010	mg/L	0.0625	ND	101	80-120			
Barium	0.108	0.004	mg/L	0.0625	0.046	98.7	80-120			
Beryllium	0.0573	0.0020	mg/L	0.0625	ND	91.7	80-120			
Cadmium	0.0603	0.0010	mg/L	0.0625	ND	96.5	80-120			
Chromium	0.0617	0.0020	mg/L	0.0625	ND	98.7	80-120			
Cobalt	0.060	0.004	mg/L	0.0625	ND	96.7	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	95.3	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.01	91.3	80-120			
Selenium	0.059	0.003	mg/L	0.0625	ND	93.6	80-120			
Thallium	0.0597	0.0020	mg/L	0.0625	0.0002	95.2	80-120			

**Matrix Spike (BCG0024-MS4) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:37

Mercury	0.0029	0.0005	mg/L	0.00250	ND	118	80-120			
Antimony	0.061	0.005	mg/L	0.0625	ND	98.1	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Arsenic	0.0625	0.0010	mg/L	0.0625	ND	100	80-120			
Barium	0.063	0.004	mg/L	0.0625	ND	100	80-120			
Beryllium	0.0617	0.0020	mg/L	0.0625	ND	98.8	80-120			
Cadmium	0.0617	0.0010	mg/L	0.0625	ND	98.8	80-120			
Chromium	0.0638	0.0020	mg/L	0.0625	ND	102	80-120			
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120			
Lead	0.063	0.002	mg/L	0.0625	ND	101	80-120			
Lithium	0.06	0.02	mg/L	0.0625	ND	102	80-120			
Selenium	0.060	0.003	mg/L	0.0625	ND	95.5	80-120			
Thallium	0.0634	0.0020	mg/L	0.0625	0.0001	101	80-120			



**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
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**Batch BCG0024 - EPA 200.2**

**Matrix Spike Dup (BCG0024-MSD1) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:13

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	165	4.00	mg/L	6.25	152	214	80-120	3.48	20	D2, M3

**Matrix Spike Dup (BCG0024-MSD2) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:19

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	7.31	4.00	mg/L	6.25	ND	117	80-120	13.9	20	D2

**Matrix Spike Dup (BCG0024-MSD3) Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:35

Antimony	0.064	0.005	mg/L	0.0625	ND	102	80-120	2.64	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	105	80-120	0.103	20	
Mercury	0.0028	0.0005	mg/L	0.00250	ND	112	80-120	3.47	20	
Arsenic	0.0635	0.0010	mg/L	0.0625	ND	102	80-120	0.580	20	
Barium	0.108	0.004	mg/L	0.0625	0.046	98.2	80-120	0.261	20	
Beryllium	0.0571	0.0020	mg/L	0.0625	ND	91.3	80-120	0.414	20	
Cadmium	0.0606	0.0010	mg/L	0.0625	ND	97.0	80-120	0.585	20	
Chromium	0.0619	0.0020	mg/L	0.0625	ND	99.1	80-120	0.430	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.5	80-120	0.791	20	
Lead	0.060	0.002	mg/L	0.0625	ND	95.4	80-120	0.102	20	
Lithium	0.07	0.02	mg/L	0.0625	0.01	92.0	80-120	0.655	20	
Selenium	0.059	0.003	mg/L	0.0625	ND	94.8	80-120	1.21	20	
Thallium	0.0594	0.0020	mg/L	0.0625	0.0002	94.8	80-120	0.465	20	

**Matrix Spike Dup (BCG0024-MSD4) Source: 3032611-06**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:40

Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	80-120	3.80	20	
Antimony	0.060	0.005	mg/L	0.0625	ND	96.3	80-120	1.85	20	
Mercury	2.92		ug/L	2.50	0.0510	115	80-120	200	20	Y2
Arsenic	0.0599	0.0010	mg/L	0.0625	ND	95.8	80-120	4.30	20	
Barium	0.061	0.004	mg/L	0.0625	ND	97.3	80-120	2.97	20	
Beryllium	0.0599	0.0020	mg/L	0.0625	ND	95.8	80-120	3.03	20	
Cadmium	0.0602	0.0010	mg/L	0.0625	ND	96.3	80-120	2.59	20	
Chromium	0.0612	0.0020	mg/L	0.0625	ND	97.9	80-120	4.18	20	
Cobalt	0.062	0.004	mg/L	0.0625	ND	98.5	80-120	5.15	20	
Lead	0.061	0.002	mg/L	0.0625	ND	97.7	80-120	3.57	20	
Lithium	0.06	0.02	mg/L	0.0625	ND	96.7	80-120	5.28	20	
Selenium	0.058	0.003	mg/L	0.0625	ND	92.3	80-120	3.43	20	
Thallium	0.0610	0.0020	mg/L	0.0625	0.0001	97.3	80-120	3.86	20	



**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
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**Batch BCG0024 - EPA 200.2**

**Post Spike (BCG0024-PS1)**

**Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/5/2023 12:22

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	173	4.00	mg/L	6.25	152	340	75-125			D2, M3

**Post Spike (BCG0024-PS2)**

**Source: 3032610-01**

Prepared: 7/3/2023 9:56, Analyzed: 7/7/2023 16:42

Antimony	0.062	0.005	mg/L	0.0625	ND	99.9	75-125			
Mercury	0.0028	0.0005	mg/L	0.00250	ND	111	75-125			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	75-125			
Arsenic	0.0633	0.0010	mg/L	0.0625	ND	101	75-125			
Barium	0.106	0.004	mg/L	0.0625	0.046	95.5	75-125			
Beryllium	0.0570	0.0020	mg/L	0.0625	ND	91.2	75-125			
Cadmium	0.0609	0.0010	mg/L	0.0625	ND	97.5	75-125			
Chromium	0.0618	0.0020	mg/L	0.0625	ND	98.8	75-125			
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.1	75-125			
Lead	0.059	0.002	mg/L	0.0625	ND	94.2	75-115			
Lithium	0.07	0.02	mg/L	0.0625	0.01	91.0	75-125			
Selenium	0.060	0.003	mg/L	0.0625	ND	95.6	75-125			
Thallium	0.0593	0.0020	mg/L	0.0625	0.0002	94.5	75-125			



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCF2697 - Default Prep Micro</b>										
<b>LCS (BCF2697-BS1)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.96		Std. Units	5.00		99.2	98.8-101.2			
<b>LCS (BCF2697-BS2)</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	4.99		Std. Units	5.00		99.8	98.8-101.2			
<b>Duplicate (BCF2697-DUP1) Source: 3032611-06</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	5.79	0.10	Std. Units		5.84			0.860	10	H3
<b>Duplicate (BCF2697-DUP2) Source: 3064450-01</b>										
Prepared: 7/5/2023 13:07, Analyzed: 7/5/2023 14:27										
pH (Lab)	9.64	0.10	Std. Units		9.64			0.00	10	H3
<b>Batch BCF2838 - Default Prep Wet Chem</b>										
<b>Blank (BCF2838-BLK1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCF2838-BS1)</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1490	25	mg/L	1500		99.4	80-120			
<b>Duplicate (BCF2838-DUP1) Source: 3032610-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	1040	100	mg/L		1070			3.03	10	
<b>Duplicate (BCF2838-DUP2) Source: 3063392-01</b>										
Prepared: 6/30/2023 16:45, Analyzed: 6/30/2023 16:45										
Total Dissolved Solids	7800	100	mg/L		7780			0.205	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCG0128 - Default Prep IC**

**Matrix Spike (BCG0128-MS1) Source: 3032611-06**

Prepared: 7/6/2023 3:25, Analyzed: 7/6/2023 3:25

Chloride	17.1		mg/L	12.5	0.0	137	75-125			M1
Fluoride	7.4		mg/L	5.00	0.0	147	75-125			M1
Sulfate	36		mg/L	25.0	0.4	144	75-125			M1

**Matrix Spike Dup (BCG0128-MSD1) Source: 3032611-06**

Prepared: 7/6/2023 3:52, Analyzed: 7/6/2023 3:52

Chloride	15.5		mg/L	12.5	0.0	124	75-125	9.67	15	
Fluoride	6.6		mg/L	5.00	0.0	131	75-125	11.4	15	M1
Sulfate	32		mg/L	25.0	0.4	128	75-125	11.3	15	M1

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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
<b>4500-H+ B-2000 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)

**Sample Acceptance Checklist for Work Order 3032610**

Shipped By: Client

Temperature: 5.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#:         
Quote#       

Please Print Legibly

Collected by (Signature): *Greg Dick*  
\*required information\*

Compliance Monitoring? Yes  No

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes  No

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time N/A End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # 3032610 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032610-01 A	<u>06/30/23</u>	<u>0825</u>	Plastic 500mL pH<2 w/HNO3	1	MW-110	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-01 B	<u>06/30/23</u>	<u>0825</u>	Plastic 1L	1	MW-110	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032610-01 C	<u>06/30/23</u>	<u>0825</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-110	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-01 D	<u>06/30/23</u>	<u>0825</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-01 E	<u>06/30/23</u>	<u>0825</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: ICEID

Field data collected by: <u>Greg Dick</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>0825</u>
pH <u>6.75</u>	Cond (umho) <u>1290</u>	Res Cl (mg/L) _____
Temp (oC) <u>17.70</u>	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	or (g/min) _____	Static Water Level _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u><i>Greg Dick</i></u>	Received by: (Signature) <u><i>ICEID</i></u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1250</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

**Please Print Legibly**

Collected by (Signature): My Dick  
\*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 N/A End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

LAB USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032610-01 F	<u>06/30/23</u>	<u>0825</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-110	g / c	Radium Total (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-02 A	<u>06/30/23</u>	<u>0925</u>	Plastic 500mL pH<2 w/HNO3	1	MW-111	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-02 B	<u>06/30/23</u>	<u>0925</u>	Plastic 1L	1	MW-111	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032610-02 C	<u>06/30/23</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-111	g / c	Radium 226 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				
3032610-02 D	<u>06/30/23</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g / c	Radium 228 (sub)
			Preservation Check: pH: <input checked="" type="checkbox"/>				

Preservation Check Performed by: KE D

Field data collected by: Greg Dick My Dick Date (mm/dd/yy) 06/30/23 Time (24 hr) 0925

pH 7.49 Cond (umho) 531 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 18.79 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>My Dick</u>	Received by: (Signature) <u>KE D</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1250</u>
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# Chain of Custody

**Scheduled for: 03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

Greg Dick  
PO Box 24  
Henderson, KY 42419

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Greg Dick  
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 # 3032610 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032610-02 E	<u>06/30/23</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
3032610-02 F	<u>06/30/23</u>	<u>0925</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-111	g / c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				
3032610-03 A	<u>06/30/23</u>	<u>1025</u>	Plastic 500mL pH<2 w/HNO3	1	MW-112	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <u>✓</u>				
3032610-03 B	<u>06/30/23</u>	<u>1025</u>	Plastic 1L	1	MW-112	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3032610-03 C	<u>06/30/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-112	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: KEIO

Field data collected by: Greg Dick Date (mm/dd/yy) 06/30/23 Time (24 hr) 1025

pH 7.38 Cond (umho) 530 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 18.51 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Greg Dick</u>	Received by: (Signature) <u>KEIO</u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1250</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: **03/13/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Greg Dick  
PO Box 24  
Henderson, KY 42419

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-5736  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Greg Dick*  
\*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 N/A End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**LAB USE ONLY**

\*required information\*

Workorder # 3032610 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3032610-03 D	<u>06/30/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3032610-03 E	<u>06/30/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							
3032610-03 F	<u>06/30/23</u>	<u>1025</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-112	g / c	Radium Total (sub)
Preservation Check: pH: <input checked="" type="checkbox"/>							

Thermometer Serial Number  
181390287  
181460057  
Temp 5.6 °C

Preservation Check Performed by: KED

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) <u><i>Greg Dick</i></u>	Received by: (Signature) <u><i>KED</i></u>	Date (mm/dd/yy) <u>06/30/23</u>	Time (24 hr) <u>1250</u>
_____	_____	_____	_____
_____	_____	_____	_____



July 24, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3032610  
Pace Project No.: 30602171

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 2023. 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,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 3032610  
 Pace Project No.: 30602171

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### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

---

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3032610  
Pace Project No.: 30602171

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30602171001	3032610-01	Water	06/30/23 08:25	07/06/23 10:00
30602171002	3032610-02	Water	06/30/23 09:25	07/06/23 10:00
30602171003	3032610-03	Water	06/30/23 10:25	07/06/23 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3032610  
 Pace Project No.: 30602171

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30602171001	3032610-01	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602171002	3032610-02	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30602171003	3032610-03	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	ZPC	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: 3032610  
 Pace Project No.: 30602171

**Sample: 3032610-01**      **Lab ID: 30602171001**      Collected: 06/30/23 08:25      Received: 07/06/23 10:00      Matrix: Water  
 PWS:      Site ID:      Sample Type:  
 Comments: • Collection time on containers does not match COC

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.590 ± 0.436 (0.591)</b> C:NA T:100%	pCi/L	07/20/23 14:16	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.657 ± 0.304 (0.478)</b> C:81% T:93%	pCi/L	07/19/23 11:27	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.25 ± 0.740 (1.07)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032610-02**      **Lab ID: 30602171002**      Collected: 06/30/23 09:25      Received: 07/06/23 10:00      Matrix: Water  
 PWS:      Site ID:      Sample Type:  
 Comments: • Collection time on containers does not match COC

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.719 ± 0.636 (0.943)</b> C:NA T:82%	pCi/L	07/20/23 14:16	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.760 ± 0.354 (0.588)</b> C:82% T:91%	pCi/L	07/19/23 11:27	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.48 ± 0.990 (1.53)</b>	pCi/L	07/24/23 10:30	7440-14-4	

**Sample: 3032610-03**      **Lab ID: 30602171003**      Collected: 06/30/23 10:25      Received: 07/06/23 10:00      Matrix: Water  
 PWS:      Site ID:      Sample Type:  
 Comments: • Collection time on containers does not match COC

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.474 ± 0.638 (1.07)</b> C:NA T:90%	pCi/L	07/20/23 14:16	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.22 ± 0.497 (0.805)</b> C:81% T:86%	pCi/L	07/19/23 11:28	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.69 ± 1.14 (1.88)</b>	pCi/L	07/24/23 10:30	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3032610  
 Pace Project No.: 30602171

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QC Batch: 600244	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30602171001, 30602171002, 30602171003

---

METHOD BLANK: 2917653 Matrix: Water  
 Associated Lab Samples: 30602171001, 30602171002, 30602171003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.322 (0.624) C:84% T:78%	pCi/L	07/19/23 11:27	

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: 3032610  
 Pace Project No.: 30602171

---

QC Batch: 600243	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30602171001, 30602171002, 30602171003

---

METHOD BLANK: 2917652 Matrix: Water  
 Associated Lab Samples: 30602171001, 30602171002, 30602171003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.237 (0.382) C:NA T:84%	pCi/L	07/20/23 14:16	

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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## QUALIFIERS

Project: 3032610  
Pace Project No.: 30602171

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### 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.

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 3032610  
 Pace Project No.: 30602171

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
30602171001	3032610-01	EPA 903.1	600243		
30602171002	3032610-02	EPA 903.1	600243		
30602171003	3032610-03	EPA 903.1	600243		
30602171001	3032610-01	EPA 904.0	600244		
30602171002	3032610-02	EPA 904.0	600244		
30602171003	3032610-03	EPA 904.0	600244		
30602171001	3032610-01	Total Radium Calculation	603591		
30602171002	3032610-02	Total Radium Calculation	603591		
30602171003	3032610-03	Total Radium Calculation	603591		

**REPORT OF LABORATORY ANALYSIS**

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Chain of Custody



Workorder: 3032610

Workorder Name: HMPL Surface Impoundme

Owner Received Date: 6/30/2023

Results Requested By: Standard

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			Date/Time	Comments
						Radium 226	Radium 228	Radium Total		
1	3032610-01		06/30/23 08:25	IR44-McCoy	Water	X	X	X		
2	3032610-02		06/30/23 09:25	IR44-McCoy	Water	X	X	X		
3	3032610-03		06/30/23 10:25	IR44-McCoy	Water	X	X	X		
4										
5										
6										
7										
8										
9										
10										

Transfers	Released By	Date/Time	Received By	Date/Time
1	Kayla Zachary	7/5/2023	<i>[Signature]</i>	7-6-23 10:00
2				
3				

Cooler Temperature on Receipt 4.4 °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.

Friday, June 17, 2016 11:01:34 AM

WO#: 30602171

30602171

Page 1 of 1

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3032610**

**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
<b>Sample ID: 3032610-01</b>	<b>Water</b>	<b>Sampled:06/30/2023 08:25</b>	<b>Specific Method</b>
Radium Total (sub)	12/27/2023 08:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	12/27/2023 08:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/27/2023 08:25	EPA 903.1	
<b>Sample ID: 3032610-02</b>	<b>Water</b>	<b>Sampled:06/30/2023 09:25</b>	<b>Specific Method</b>
Radium Total (sub)	12/27/2023 09:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	12/27/2023 09:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/27/2023 09:25	EPA 903.1	
<b>Sample ID: 3032610-03</b>	<b>Water</b>	<b>Sampled:06/30/2023 10:25</b>	<b>Specific Method</b>
Radium Total (sub)	12/27/2023 10:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)	12/27/2023 10:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)	12/27/2023 10:25	EPA 903.1	

**WO# : 30602171**  
 PM: SMB      Due Date: 07/27/23  
 CLIENT: PACE\_44\_MVKY

*Grey Alexander 7-6-23 10:00*

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_


**DC# Title: ENV-FRM-GBUR-0088 v05\_Sample Condition**  
**Pittsburgh**  
**WO#: 30602171**  
**Effective Date: 07/06/2023**  
**PM: SMB** **Due Date: 07/27/23**  
**CLIENT: PACE\_44\_MVKY**

**Client Name:** Pace Madisonville

**Courier:**  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

**Initial / Date**

**Tracking Number:** 12067 YS70142801181

**Examined By:** TH 7/6/23

**Custody Seal on Cooler/Box Present:**  Yes  No **Seals Intact:**  Yes  No

**Labeled By:** TH 7/6/23

**Thermometer Used:** 16 **Type of Ice:** Wet Blue None

**Temped By:** TH 7/6/23

**Cooler Temperature:** Observed Temp 4.4 °C **Correction Factor:** 0 °C **Final Temp:** 4.4 °C  
 Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot#	D.P.D. Residual Chlorine Lot #
				<u>1003121</u>	
Chain of Custody Present	J				
Chain of Custody Filled Out:	J				
-Were client corrections present on COC		J			
Chain of Custody Relinquished	J				
Sampler Name & Signature on COC:		J			
Sample Labels match COC:		J			
-Includes date/time/ID					
Matrix:					
Samples Arrived within Hold Time:	J				
Short Hold Time Analysis (<72hr remaining):		J			
Rush Turn Around Time Requested:		J			
Sufficient Volume:	J				
Correct Containers Used:	J				
-Pace Containers Used	J				
Containers Intact:	J				
Orthophosphate field filtered:			J		
Hex Cr Aqueous samples field filtered:			J		
Organic Samples checked for dechlorination			J		
Filtered volume received for dissolved tests:			J		
All containers checked for preservation:	J				
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix					
All containers meet method preservation requirements:	J			<u>PH42</u>	
				Initial when completed <u>TH</u>	Date/Time of Preservation
				Lot# of added Preservative	
8260C/D: Headspace in VOA Vials (> 6mm)			J		
624.1: Headspace in VOA Vials (0mm)			J		
Trip Blank Present:			J		Trip blank custody seal present? YES or NO
Rad Samples Screened <0.5 mrem/hr.	J			Initial when completed <u>TH</u>	Date: <u>7/6/23</u> Survey Meter SN: <u>1563</u>
Comments:					

**Note:** For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.



TH 71663  
 Profile Number 11851

Client 303610 Site Page 1 of 1

Notes

Sample Line Item	Matrix	Amber Glass										Plastic										Vials										Other					
		AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WG9U	WG9T	WG9U	ZPLC	GCUB	GJN	12GN	GN	BG1U									
1	W																																				
2	W																																				
3	W																																				

Container Codes

Glass	
DG9S	40mL amber VOA vial H2SO4
VG9U	40mL clear VOA vial
VG9T	40mL clear VOA vial Na Thiosulfate
VG9H	40mL clear VOA vial HCl
JGFU	4oz amber wide jar
WGFU	4oz wide jar unpreserved
BG2U	500mL clear glass unpreserved
AG2U	500mL amber glass unpreserved
WGKU	8oz wide jar unpres
GN	General

WO#: 30602171

PM: SMB Due Date: 07/27/23  
 CLIENT: PACE\_44\_MVKY

Qualtrax ID: 55678

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
	plastic H2SO4
	plastic unpreserved

EZI	5g Encore
VOAK	Kit Volatile Solid
I	Wipe/Swab
ZPLC	Siploc Bag

WT	Water
SL	Solid
OL	Non-Aq Liquid
WIP	Wipe



## Certificate of Analysis 3114321

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 12/20/2023 14:14

Project Name: HMPL Surface Impoundment

Workorder: 3114321

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/21/2023 13:14.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3114321-01	MW7/	Groundwater	11/21/2023 08:44	11/21/2023 13:14	Kaelyn Sperle
3114321-02	MW9/	Groundwater	11/21/2023 11:54	11/21/2023 13:14	Kaelyn Sperle
3114321-03	MW10/	Groundwater	11/21/2023 10:06	11/21/2023 13:14	Kaelyn Sperle
3114321-04	DUPLICATE/	Groundwater	11/21/2023 00:00	11/21/2023 13:14	Kaelyn Sperle
3114321-05	FIELD BLANK/	Water	11/21/2023 00:00	11/21/2023 13:14	Kaelyn Sperle

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
3114321-01	Field Dissolved Oxygen	3.61
	Field pH	7.18
	Field Temp (C)	14.7
	Field Turbidity	5.20
3114321-02	Field Dissolved Oxygen	1.98
	Field pH	6.93
	Field Temp (C)	16.1
	Field Turbidity	28.23
3114321-03	Field Conductance	0.659
	Field Dissolved Oxygen	2.08
	Field pH	9.12
	Field Temp (C)	15.1
	Field Turbidity	5.83



**ANALYTICAL RESULTS**

Lab Sample ID: **3114321-01**  
 Description: **MW7**

Sample Collection Date Time: 11/21/2023 08:44  
 Sample Received Date Time: 11/21/2023 13:14

**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	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Arsenic</b>	<b>0.0030</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Barium</b>	<b>0.076</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Boron</b>	<b>0.35</b>		mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/30/2023 15:22	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Calcium</b>	<b>39.4</b>	D1	mg/L	4.00	1.30	SW846 6010 B	11/27/2023 08:58	11/29/2023 16:55	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Lead</b>	<b>0.0005</b>	J	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Lithium</b>	<b>0.007</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
<b>Molybdenum</b>	<b>0.009</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:55	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.39</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>238</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.215</b>	_Sub	pCi/L			EPA 903.1	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.347</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>Radium</b>	<b>0.562</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.562</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>3.0</b>		mg/L	0.5	0.4	SW846 9056	11/28/2023 22:49	11/28/2023 22:49	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	11/29/2023 13:14	11/29/2023 13:14	CSC
<b>Sulfate</b>	<b>11</b>		mg/L	1	0.5	SW846 9056	11/28/2023 22:49	11/28/2023 22:49	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3114321-02**  
 Description: **MW9**

Sample Collection Date Time: 11/21/2023 11:54  
 Sample Received Date Time: 11/21/2023 13:14

**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	11/27/2023 08:58	11/27/2023 14:59	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
<b>Barium</b>	<b>0.251</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Boron	ND	v1, u	mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:01	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
<b>Calcium</b>	<b>59.4</b>	D1	mg/L	4.00	1.30	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:04	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:59	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.06</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>314</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.946</b>	_Sub	pCi/L			EPA 903.1	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.250</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>Radium</b>	<b>1.20</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.20</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>6.5</b>		mg/L	0.5	0.4	SW846 9056	11/28/2023 23:16	11/28/2023 23:16	CSC
<b>Fluoride</b>	<b>0.2</b>		mg/L	0.2	0.2	SW846 9056	11/29/2023 13:41	11/29/2023 13:41	CSC
Sulfate	ND	u	mg/L	1	0.5	SW846 9056	11/28/2023 23:16	11/28/2023 23:16	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3114321-03**  
 Description: **MW10**

Sample Collection Date Time: 11/21/2023 10:06  
 Sample Received Date Time: 11/21/2023 13:14

**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	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Arsenic</b>	<b>0.0016</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Barium</b>	<b>0.165</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Boron</b>	<b>0.56</b>		mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:20	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Calcium</b>	<b>9.16</b>		mg/L	0.40	0.13	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:20	MRWD
<b>Chromium</b>	<b>0.0006</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Lithium</b>	<b>0.54</b>		mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Mercury</b>	<b>0.0002</b>	J	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:03	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.97</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>408</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.00	_Sub	pCi/L			EPA 903.1	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.210</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>Radium</b>	<b>0.210</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>0.210</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>17.2</b>		mg/L	0.5	0.4	SW846 9056	11/28/2023 23:44	11/28/2023 23:44	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	11/29/2023 14:08	11/29/2023 14:08	CSC
<b>Sulfate</b>	<b>24</b>		mg/L	1	0.5	SW846 9056	11/28/2023 23:44	11/28/2023 23:44	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3114321-04**  
 Description: **DUPLICATE**

Sample Collection Date Time: 11/21/2023 00:00  
 Sample Received Date Time: 11/21/2023 13:14

**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	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Arsenic</b>	<b>0.0016</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Barium</b>	<b>0.162</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Boron</b>	<b>0.55</b>		mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:29	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Calcium</b>	<b>9.54</b>		mg/L	0.40	0.13	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:29	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Lithium</b>	<b>0.52</b>		mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Mercury</b>	<b>0.0002</b>	J	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
<b>Molybdenum</b>	<b>0.005</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:06	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.97</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>428</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.690</b>	_Sub	pCi/L			EPA 903.1	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>1.64</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>Radium</b>	<b>2.33</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
<b>See Attached Subcontract Report</b>	<b>2.33</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>17.4</b>		mg/L	0.5	0.4	SW846 9056	11/29/2023 00:11	11/29/2023 00:11	CSC
<b>Fluoride</b>	<b>0.5</b>		mg/L	0.2	0.2	SW846 9056	11/29/2023 14:36	11/29/2023 14:36	CSC
<b>Sulfate</b>	<b>24</b>		mg/L	1	0.5	SW846 9056	11/29/2023 00:11	11/29/2023 00:11	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3114321-05**  
 Description: **FIELD BLANK**

Sample Collection Date Time: 11/21/2023 00:00  
 Sample Received Date Time: 11/21/2023 13:14

**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	11/27/2023 08:58	11/27/2023 15:28	AKB
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Barium	ND	u	mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/28/2023 19:00	AKB
Boron	ND	v1, u	mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:39	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	11/27/2023 08:58	11/29/2023 17:39	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/28/2023 19:00	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 15:28	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	6.05	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
Total Dissolved Solids	ND	G1, u	mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
See Attached Subcontract Report	0.180	_Sub	pCi/L			EPA 903.1	12/20/2023 11:48	12/20/2023 11:49	RCW
See Attached Subcontract Report	0.467	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
Radium	0.647	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW
See Attached Subcontract Report	0.647	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:48	12/20/2023 11:49	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	u	mg/L	0.5	0.4	SW846 9056	11/29/2023 00:39	11/29/2023 00:39	CSC
Fluoride	ND	L1, u	mg/L	0.2	0.2	SW846 9056	11/29/2023 00:39	11/29/2023 00:39	CSC
Sulfate	ND	u	mg/L	1	0.5	SW846 9056	11/29/2023 00:39	11/29/2023 00:39	CSC





**Notes for work order 3114321**

- 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.
- D1 Sample required dilution due to high concentration of target analyte.
- D2 Sample required dilution due to matrix interference.
- E Concentration exceeds calibration range
- G1 Residue yield was less than the method required 2.5mg.
- 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.
- 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.
- T16 Sample receipt temperature outside 0 - 6°C; sample not collected on same day as receipt; sample received on ice; client gave permission to proceed as documented on the COC or the project manager notified to contact client before proceeding.
- 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.
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

- 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



**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
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**Batch BCK2072 - EPA 200.2**

**Blank (BCK2072-BLK1)**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 14:37

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
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**Blank (BCK2072-BLK2)**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 16:04

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U

**LCS (BCK2072-BS1)**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 14:41

Molybdenum	0.06	0.01	mg/L	0.0625		101	85-115			
Antimony	0.062	0.005	mg/L	0.0625		98.6	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		99.0	85-115			
Arsenic	0.0619	0.0010	mg/L	0.0625		99.1	85-115			
Barium	0.061	0.004	mg/L	0.0625		97.8	85-115			
Beryllium	0.0562	0.0020	mg/L	0.0625		89.9	85-115			
Cadmium	0.0610	0.0010	mg/L	0.0625		97.6	85-115			
Chromium	0.0611	0.0020	mg/L	0.0625		97.7	85-115			
Cobalt	0.060	0.004	mg/L	0.0625		96.7	85-115			
Lead	0.058	0.002	mg/L	0.0625		93.4	85-115			
Lithium	0.06	0.02	mg/L	0.0625		88.8	85-115			
Selenium	0.061	0.003	mg/L	0.0625		97.1	85-115			
Thallium	0.0595	0.0020	mg/L	0.0625		95.2	85-115			



**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
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**Batch BCK2072 - EPA 200.2**

**LCS (BCK2072-BS2)**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 16:07

Boron	0.13	0.10	mg/L	0.125		108	85-115			
Calcium	6.15	0.40	mg/L	6.25		98.3	85-115			

**Matrix Spike (BCK2072-MS1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:35

Antimony	0.062	0.005	mg/L	0.0625	ND	99.8	80-120			
Mercury	0.0033	0.0005	mg/L	0.00250	ND	131	80-120			M1
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Arsenic	0.0651	0.0010	mg/L	0.0625	0.0006	103	80-120			
Barium	0.110	0.004	mg/L	0.0625	0.046	102	80-120			
Beryllium	0.0538	0.0020	mg/L	0.0625	ND	86.1	80-120			
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.8	80-120			
Chromium	0.0654	0.0020	mg/L	0.0625	0.0028	100	80-120			
Cobalt	0.062	0.004	mg/L	0.0625	ND	98.7	80-120			
Lead	0.059	0.002	mg/L	0.0625	0.001	93.1	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.01	85.2	80-120			
Selenium	0.062	0.003	mg/L	0.0625	ND	98.8	80-120			
Thallium	0.0591	0.0020	mg/L	0.0625	ND	94.6	80-120			

**Matrix Spike (BCK2072-MS2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 17:58

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	119	4.00	mg/L	6.25	105	232	80-120			D2, M3

**Matrix Spike Dup (BCK2072-MSD1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:39

Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	1.64	20	
Mercury	0.0026	0.0005	mg/L	0.00250	ND	106	80-120	21.0	20	Y2
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120	0.239	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	0.0006	103	80-120	0.143	20	
Barium	0.109	0.004	mg/L	0.0625	0.046	100	80-120	0.927	20	
Beryllium	0.0540	0.0020	mg/L	0.0625	ND	86.4	80-120	0.357	20	
Cadmium	0.0626	0.0010	mg/L	0.0625	ND	100	80-120	1.30	20	
Chromium	0.0649	0.0020	mg/L	0.0625	0.0028	99.3	80-120	0.842	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	98.2	80-120	0.545	20	
Lead	0.060	0.002	mg/L	0.0625	0.001	94.0	80-120	0.968	20	
Lithium	0.07	0.02	mg/L	0.0625	0.01	84.8	80-120	0.348	20	
Selenium	0.062	0.003	mg/L	0.0625	ND	99.3	80-120	0.578	20	
Thallium	0.0596	0.0020	mg/L	0.0625	ND	95.4	80-120	0.828	20	



**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
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**Batch BCK2072 - EPA 200.2**

**Matrix Spike Dup (BCK2072-MSD2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 18:01

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	115	4.00	mg/L	6.25	105	155	80-120	4.08	20	D2, M3

**Post Spike (BCK2072-PS1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:42

Mercury	0.0026	0.0005	mg/L	0.00250	ND	105	75-125			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	75-125			
Antimony	0.055	0.005	mg/L	0.0625	ND	87.9	75-125			
Arsenic	0.0635	0.0010	mg/L	0.0625	0.0006	101	75-125			
Barium	0.107	0.004	mg/L	0.0625	0.046	96.7	75-125			
Beryllium	0.0520	0.0020	mg/L	0.0625	ND	83.2	75-125			
Cadmium	0.0608	0.0010	mg/L	0.0625	ND	97.2	75-125			
Chromium	0.0629	0.0020	mg/L	0.0625	0.0028	96.1	75-125			
Cobalt	0.060	0.004	mg/L	0.0625	ND	95.8	75-125			
Lead	0.058	0.002	mg/L	0.0625	0.001	91.2	75-115			
Lithium	0.07	0.02	mg/L	0.0625	0.01	82.3	75-125			
Selenium	0.061	0.003	mg/L	0.0625	ND	97.1	75-125			
Thallium	0.0581	0.0020	mg/L	0.0625	ND	93.0	75-125			

**Post Spike (BCK2072-PS2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 18:04

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	114	4.00	mg/L	6.25	105	140	75-125			D2, M3



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCK1701 - Default Prep Micro

LCS (BCK1701-BS1)

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
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LCS (BCK1701-BS2)

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
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Duplicate (BCK1701-DUP1) Source: 3113381-03

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	8.04	0.10	Std. Units		8.04			0.00	10	H3
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Duplicate (BCK1701-DUP2) Source: 3114321-03

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	9.01	0.10	Std. Units		8.97			0.445	10	H3
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Batch BCK2067 - Default Prep Wet Chem

Blank (BCK2067-BLK1)

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCK2067-BS1)

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	1500	25	mg/L	1500		99.7	80-120			
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Duplicate (BCK2067-DUP1) Source: 3112057-02

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	1850	250	mg/L		1780			3.86	10	
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Duplicate (BCK2067-DUP2) Source: 3114323-01

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	400	50	mg/L		408			1.98	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
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**Batch BCK2387 - Default Prep IC**

**Blank (BCK2387-BLK1)**

Prepared: 11/29/2023 3:23, Analyzed: 11/29/2023 3:23

Fluoride	ND	0.2	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1	mg/L							U

**Blank (BCK2387-BLK2)**

Prepared: 11/29/2023 15:30, Analyzed: 11/29/2023 15:30

Fluoride	ND	0.2	mg/L							U
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**LCS (BCK2387-BS1)**

Prepared: 11/29/2023 2:56, Analyzed: 11/29/2023 2:56

Chloride	13.2		mg/L	12.5		106	90-110			
Fluoride	5.6		mg/L	5.00		111	90-110			L1
Sulfate	26		mg/L	25.0		103	90-110			

**LCS (BCK2387-BS2)**

Prepared: 11/29/2023 15:03, Analyzed: 11/29/2023 15:03

Fluoride	5.3		mg/L	5.00		105	90-110			
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**Matrix Spike (BCK2387-MS1) Source: 3114321-01**

Prepared: 11/29/2023 1:33, Analyzed: 11/29/2023 1:33

Chloride	15.4		mg/L	12.5	2.7	102	75-125			
Fluoride	5.2		mg/L	5.00	0.3	98.9	75-125			
Sulfate	37		mg/L	25.0	10	106	75-125			

**Matrix Spike (BCK2387-MS2) Source: 3114321-02**

Prepared: 11/29/2023 3:50, Analyzed: 11/29/2023 3:50

Chloride	18.3		mg/L	12.5	5.8	100	75-125			
Fluoride	5.3		mg/L	5.00	0.2	102	75-125			
Sulfate	25		mg/L	25.0	0.4	99.8	75-125			

**Matrix Spike (BCK2387-MS3) Source: 3114321-03**

Prepared: 11/29/2023 4:45, Analyzed: 11/29/2023 4:45

Chloride	27.1		mg/L	12.5	15.5	92.7	75-125			
Fluoride	5.2		mg/L	5.00	0.4	96.7	75-125			
Sulfate	45		mg/L	25.0	22	92.0	75-125			



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK2387 - Default Prep IC**

**Matrix Spike Dup (BCK2387-MSD1) Source: 3114321-01**

Prepared: 11/29/2023 2:01, Analyzed: 11/29/2023 2:01

Chloride	15.6		mg/L	12.5	2.7	103	75-125	1.33	15	
Fluoride	5.5		mg/L	5.00	0.3	104	75-125	4.98	15	
Sulfate	37		mg/L	25.0	10	110	75-125	2.40	15	

**Matrix Spike Dup (BCK2387-MSD2) Source: 3114321-02**

Prepared: 11/29/2023 4:18, Analyzed: 11/29/2023 4:18

Chloride	18.3		mg/L	12.5	5.8	100	75-125	0.0600	15	
Fluoride	5.0		mg/L	5.00	0.2	94.9	75-125	7.16	15	
Sulfate	25		mg/L	25.0	0.4	99.3	75-125	0.546	15	

**Matrix Spike Dup (BCK2387-MSD3) Source: 3114321-03**

Prepared: 11/29/2023 5:13, Analyzed: 11/29/2023 5:13

Chloride	28.8		mg/L	12.5	15.5	106	75-125	5.94	15	
Fluoride	5.7		mg/L	5.00	0.4	106	75-125	8.71	15	
Sulfate	48		mg/L	25.0	22	104	75-125	6.73	15	

**Certified Analyses included in this Report**

Analyte	Certifications
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**2540 C-2015 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 MS Drinking Water MADV

**SM 4500-H+ B-2011 in Water**

pH (Lab) KY Drinking Water Mdv (00030) TN Drinking Water (02819)

**SW846 6010 B in Water**

Calcium VA NELAC MDV (460210)

**Sample Acceptance Checklist for Work Order 3114321**

Shipped By: Client

Temperature: 15.80° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: HMPL Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:                       
State: KY

PO#:                       
Quote#:                     

**Please Print Legibly**

Collected by (Signature): Kaelyn Spierle  
\*required information\*

Compliance Monitoring? Yes      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 # 3112057 Sample ID#	*required information* Date (mm/dd/yy): 11/21/23 0844	Collection Time (24 hr): 0844	Bottle and Preservative Plastic 500mL pH<2 w/HNO3	Containers 1	Sample Description MW7	Composite g / c	Sample Analysis Requested Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
3112057-01 A	11/21/23 0844	0844	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
3112057-01 B	11/21/23 0844	0844	Plastic 1L	1	MW7	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056 Radium 226 (sub)
3112057-01 C	11/21/23 0844	0844	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)
3112057-01 D	11/21/23 0844	0844	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
3112057-01 E	11/21/23 0844	0844	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)

3114321

Preservation Check Performed by: KED

Thermometer Serial Number  
181390287  
181460057  
Temp 14.2°C

MW-7 Field data collected by: <u>Kaelyn Spierle</u> Date (mm/dd/yy) <u>11/21/23</u> Time (24 hr) <u>0844</u>	Res Cl (mg/L) <u>          </u> Tot Cl (mg/L) <u>          </u> Free Cl (mg/L) <u>          </u>
pH <u>7.18</u> Cond (umho/cm) <u>3871</u>	Static Water Level <u>          </u> DO (mg/L) <u>3.61</u> Turb. (NTU) <u>5.20</u>
Temp (oC) <u>14.7</u> or (oF) <u>          </u>	Flow (MGD) <u>          </u> or (CFS) <u>          </u> or (g/min) <u>          </u>

Relinquished by: (Signature)

Kaelyn Spierle

Received by: (Signature)

Therri Burkard

Date (mm/dd/yy)

11/21/23

Time (24 hr)

13:14



# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: HMPL Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Ortle  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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**

**\*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-01 F	<u>11/21/23</u>	<u>0844</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
			Preservation Check: pH: _____				
3112057-02 A			Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: _____				
3112057-02 B			Plastic 1L	1	MW8	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3112057-02 C			Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
			Preservation Check: pH: _____				
3112057-02 D			Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH: _____				

3114321

Preservation Check Performed by: KED

Thermometer Serial Number  
181390287  
181460057  
Temp 11.2C

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____	
pH _____	Cond (umho) _____	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____	DO (mg/L) _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____	Free Cl (mg/L) _____
			Turb. (NTU) _____

Relinquished by: (Signature)  
Kaelyn Ortle

Received by: (Signature)  
Yvonne Beckard

Date (mm/dd/yy) 11/21/23  
Time (24 hr) 13:14

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Karlyn Sperte  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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**

**\*required information\***

Workorder # 3112057 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-02 E	<del>11/21/23</del>	<del>1154</del>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH:	<del>X</del>			
<del>3112057-02 E</del>	<del>11/21/23</del>	<del>1154</del>	<del>Plastic 1L pH&lt;2 w/HNO3 (Sub)</del>	<del>1</del>	<del>MW8</del>	<del>g / c</del>	<del>Radium Total (sub)</del>
			Preservation Check: pH:	<del>✓</del>			
3112057-03 A	11/21/23	1154	Plastic 500mL pH<2 w/HNO3	1	MW9	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH:	✓			
3112057-03 B	11/21/23	1154	Plastic 1L	1	MW9	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3112057-03 C	11/21/23	1154	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW9	g / c	Radium 226 (sub)
			Preservation Check: pH:	✓			

Preservation Check Performed by: KES

Thermometer Serial Number  
✓ 181390287  
181460057  
Temp 5.9°C

MW-9  
Field data collected by: Karlyn Sperte Date (mm/dd/yy) 11/21/23 Time (24 hr) 1154

pH 6.93 Cond (umho/cm) 4673 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.1 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 1.98 Turb. (NTU) 28.23

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)  
Karlyn Sperte

Received by: (Signature)  
Hanni Beckard

Date (mm/dd/yy) 11/21/23 Time (24 hr) 13:14

# Chain of Custody

Scheduled for: 11/20/2023



Client: **Big Rivers Electric Corporation**  
Reid/Green Station

Report To:  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Invoice To:  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Project: **HMPL Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Amle

Compliance Monitoring? Yes \_\_\_ 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 # 3112057 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-03 D	<u>11/21/23</u>	<u>1154</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-03 E	<u>11/21/23</u>	<u>1154</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-03 F	<u>11/21/23</u>	<u>1154</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW9	g / c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-04 A	<u>11/21/23</u>	<u>1006</u>	Plastic 500mL pH<2 w/HNO3	1	MW10	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <u>✓</u>				
3112057-04 B	<u>11/21/23</u>	<u>1006</u>	Plastic 1L	1	MW10	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056

3114321  
Preservation Check Performed by: KED

MW-10	Date (mm/dd/yy) <u>11/21/23</u>	Time (24 hr) <u>1006</u>
Field data collected by: <u>Kaelyn Sperte</u>	Res Cl (mg/L) _____	Tot Cl (mg/L) _____
pH <u>9.12</u>	Cond (umho) <u>MS/cm .659</u>	Free Cl (mg/L) _____
Temp (oC) <u>15.1</u>	Static Water Level _____	DO (mg/L) <u>2.08</u>
Flow (MGD) _____	or (CFS) _____	Turb. (NTU) <u>5.83</u>
	or (g/min) _____	

Relinquished by: (Signature)  
Kaelyn Amle

Received by: (Signature) Kevin Burkard Date (mm/dd/yy) 11/21/23 Time (24 hr) 13:14

PACE- Check here if trip charge applied to associated COC

### Chain of Custody

Scheduled for: 11/20/2023



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** HMPL Surface Impoundment

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#:

Please Print Legibly

Collected by (Signature): Kaelyn Jule *\*required information\**

Compliance Monitoring? Yes \_\_\_ 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 Work order # 3112057 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-04 C	<u>11/21/23</u>	<u>1006</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-04 D	<u>11/21/23</u>	<u>1006</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-04 E	<u>11/21/23</u>	<u>1006</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
3112057-04 F	<u>11/21/23</u>	<u>1006</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW10	g / c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				

3114321

Preservation Check Performed by: KED

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	Static Water Level _____	DO (mg/L) _____
	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature)  
Kaelyn Jule

Received by: (Signature)  
Kari Becklund

Date (mm/dd/yy) 11/21/23  
Time (24 hr) 13:14

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

PO#:  
Quote#

**Please Print Legibly**

Collected by (Signature): Kaelyn Smile  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

\*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Samples Chlorinated? Yes \_\_\_ No X

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**

**\*required information\***

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057	(mm/dd/yy):	Time (24 hr):					
3112057-05 A	<u>11/21/23</u>	<u>/</u>	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			<b>Preservation Check: pH :</b>	<input checked="" type="checkbox"/>			
3112057-05 B	<u>11/21/23</u>	<u>/</u>	Plastic 1L	1	DUPLICATE	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056 Radium 226 (sub)
3112057-05 C	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	
			<b>Preservation Check: pH :</b>	<input checked="" type="checkbox"/>			
3112057-05 D	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			<b>Preservation Check: pH :</b>	<input checked="" type="checkbox"/>			
3112057-05 E	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			<b>Preservation Check: pH :</b>	<input checked="" type="checkbox"/>			

Preservation Check Performed by: KED

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	Static Water Level _____	DO (mg/L) _____
	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature)  
Kaelyn Smile

Received by: (Signature)  
Yvonne Beckard

Date (mm/dd/yy) 11/21/23  
Time (24 hr) 13:14

### Chain of Custody

Scheduled for: 11/20/2023



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** HMPL Surface Impoundment

Phone: (270) 844-6000  
PWS ID#: \_\_\_\_\_  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Karlyn Orle  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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**

**\*required information\***

Workorder #	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-05 F	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-06 A	<u>11/21/23</u>	<u>/</u>	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-06 B	<u>11/21/23</u>	<u>/</u>	Plastic 1L	1	FIELD BLANK	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056 Radium 226 (sub)
3112057-06 C	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-06 D	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			

3114321

Preservation Check Performed by: KCO

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	Static Water Level _____	DO (mg/L) _____
	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature)  
Karlyn Orle

Received by: (Signature)  
Karen Beckard

Date (mm/dd/yy) 11/21/23  
Time (24 hr) 13:14

PACE- Check here if trip charge applied to associated COC

Printed: 11/13/2023 11:50:38AM

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

**Please Print Legibly**

Collected by (Signature): Karlyn Orle  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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**

**\*required information\***

Workorder #	Date	Collection	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057	(mm/dd/yy):	Time (24 hr):					
3112057-06 E	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			<b>Preservation Check: pH :</b> <u>    </u>				
3112057-06 F	<u>11/21/23</u>	<u>/</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			<b>Preservation Check: pH :</b> <u>    </u>				

3114321

Preservation Check Performed by: KED

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	Static Water Level _____	DO (mg/L) _____
	or (g/min) _____	Turb. (NTU) _____

Relinquished by: (Signature)  
Karlyn Orle

Received by: (Signature)  
Shawn Beckard

Date (mm/dd/yy) 11/21/23  
Time (24 hr) 13:14



December 19, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3114321  
Pace Project No.: 30642421

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2023. 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,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 3114321  
 Pace Project No.: 30642421

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3114321  
Pace Project No.: 30642421

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30642421001	3114321-01	Water	11/21/23 08:44	11/28/23 09:40
30642421002	3114321-02	Water	11/21/23 11:54	11/28/23 09:40
30642421003	3114321-03	Water	11/21/23 10:06	11/28/23 09:40
30642421004	3114321-04	Water	11/21/23 00:00	11/28/23 09:40
30642421005	3114321-05	Water	11/21/23 00:00	11/28/23 09:40

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3114321  
 Pace Project No.: 30642421

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30642421001	3114321-01	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30642421002	3114321-02	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30642421003	3114321-03	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30642421004	3114321-04	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
30642421005	3114321-05	EPA 903.1	CLM	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: 3114321  
 Pace Project No.: 30642421

**Sample: 3114321-01** Lab ID: **30642421001** Collected: 11/21/23 08:44 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Sample collection times not listed on labels, time on bottle cap does not match COC  
 • 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH <2.  
 • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.215 ± 0.473 (0.854)</b> C:NA T:94%	pCi/L	12/18/23 12:08	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.347 ± 0.347 (0.712)</b> C:77% T:82%	pCi/L	12/12/23 14:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.562 ± 0.820 (1.57)</b>	pCi/L	12/19/23 13:39	7440-14-4	

**Sample: 3114321-02** Lab ID: **30642421002** Collected: 11/21/23 11:54 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Sample collection times not listed on labels, time on bottle cap does not match COC  
 • 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH <2.  
 • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.946 ± 0.534 (0.599)</b> C:NA T:86%	pCi/L	12/18/23 12:08	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.250 ± 0.387 (0.837)</b> C:74% T:80%	pCi/L	12/12/23 14:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.20 ± 0.921 (1.44)</b>	pCi/L	12/19/23 13:39	7440-14-4	

**Sample: 3114321-03** Lab ID: **30642421003** Collected: 11/21/23 10:06 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Sample collection times not listed on labels, time on bottle cap does not match COC  
 • 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH <2.  
 • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.000 ± 0.344 (0.727)</b> C:NA T:89%	pCi/L	12/18/23 12:20	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.210 ± 0.483 (1.07)</b> C:74% T:80%	pCi/L	12/12/23 14:56	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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 without the written consent of Pace Analytical Services, LLC.



### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 3114321  
 Pace Project No.: 30642421

<b>Sample:</b> 3114321-03	<b>Lab ID:</b> 30642421003	Collected: 11/21/23 10:06	Received: 11/28/23 09:40	Matrix: Water		
PWS:	Site ID:	Sample Type:				
Comments: <ul style="list-style-type: none"> <li>• Sample collection times not listed on labels, time on bottle cap does not match COC</li> <li>• 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH &lt;2.</li> <li>• Samplers name and signature not listed on COC.</li> </ul>						
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.210 ± 0.827 (1.80)</b>	pCi/L	12/19/23 13:39	7440-14-4	

<b>Sample:</b> 3114321-04	<b>Lab ID:</b> 30642421004	Collected: 11/21/23 00:00	Received: 11/28/23 09:40	Matrix: Water		
PWS:	Site ID:	Sample Type:				
Comments: <ul style="list-style-type: none"> <li>• Sample collection times not listed on labels, time on bottle cap does not match COC</li> <li>• 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH &lt;2.</li> <li>• Samplers name and signature not listed on COC.</li> </ul>						
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.690 ± 0.510 (0.690)</b> C:NA T:95%	pCi/L	12/18/23 12:20	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>1.64 ± 0.628 (0.979)</b> C:75% T:77%	pCi/L	12/12/23 14:57	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>2.33 ± 1.14 (1.67)</b>	pCi/L	12/19/23 13:39	7440-14-4	

<b>Sample:</b> 3114321-05	<b>Lab ID:</b> 30642421005	Collected: 11/21/23 00:00	Received: 11/28/23 09:40	Matrix: Water		
PWS:	Site ID:	Sample Type:				
Comments: <ul style="list-style-type: none"> <li>• Sample collection times not listed on labels, time on bottle cap does not match COC</li> <li>• 11/28/23 @ 17:00 - Added 5.0ml HNO3 to Metals bottle prior to analysis. pH &lt;2.</li> <li>• Samplers name and signature not listed on COC.</li> </ul>						
Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.180 ± 0.331 (0.591)</b> C:NA T:100%	pCi/L	12/18/23 12:20	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.467 ± 0.422 (0.863)</b> C:76% T:88%	pCi/L	12/12/23 14:57	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.647 ± 0.753 (1.45)</b>	pCi/L	12/19/23 13:39	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3114321  
 Pace Project No.: 30642421

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QC Batch: 632704 Analysis Method: EPA 904.0  
 QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228  
 Laboratory: Pace Analytical Services - Greensburg  
 Associated Lab Samples: 30642421001, 30642421002, 30642421003, 30642421004, 30642421005

---

METHOD BLANK: 3084337 Matrix: Water  
 Associated Lab Samples: 30642421001, 30642421002, 30642421003, 30642421004, 30642421005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.462 ± 0.415 (0.840) C:81% T:73%	pCi/L	12/12/23 14:58	

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: 3114321  
 Pace Project No.: 30642421

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QC Batch: 632703 Analysis Method: EPA 903.1  
 QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226  
 Laboratory: Pace Analytical Services - Greensburg  
 Associated Lab Samples: 30642421001, 30642421002, 30642421003, 30642421004, 30642421005

---

METHOD BLANK: 3084336 Matrix: Water  
 Associated Lab Samples: 30642421001, 30642421002, 30642421003, 30642421004, 30642421005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0768 ± 0.175 (0.282) C:NA T:95%	pCi/L	12/18/23 11:55	

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.

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## QUALIFIERS

Project: 3114321  
Pace Project No.: 30642421

### 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.

## REPORT OF LABORATORY ANALYSIS

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SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky  
3114321

WO#: 30642421



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: 3114321-01	Water	Sampled: 11/21/2023 08:44	Specific Method <u>001</u>
Radium Total (sub)	05/19/2024 08:44	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/19/2024 08:44	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/19/2024 08:44	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Sample ID: 3114321-02	Water	Sampled: 11/21/2023 11:54	Specific Method <u>002</u>
Radium Total (sub)	05/19/2024 11:54	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/19/2024 11:54	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/19/2024 11:54	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Sample ID: 3114321-03	Water	Sampled: 11/21/2023 10:06	Specific Method <u>003</u>
Radium Total (sub)	05/19/2024 10:06	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/19/2024 10:06	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/19/2024 10:06	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Received by Pace Greensburg  
Therm ID      Corr Factor +/-       
Receipt Temp       
Corrected Temp       
Correct Preservation Y/N (N)

Released By [Signature] Date 11/27/23 Received By [Signature] Date 11/28/23 940

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3114321**

Analysis	Expires	Laboratory ID	Comments
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<b>Sample ID: 3114321-04</b>	<b>Water</b>	<b>Sampled: 11/21/2023 00:00</b>	<b>Specific Method</b> <span style="float: right;">004</span>
Radium Total (sub)		05/19/2024 00:00	EPA 904.0 Radium Sum C
Radium 228 (sub)		05/19/2024 00:00	EPA 904.0 Radium Sum C
Radium 226 (sub)		05/19/2024 00:00	EPA 903.1

**SAMPLE STATE OF ORIGIN**     Ky     **RUSH MULTIPLIER**     0    

<b>Sample ID: 3114321-05</b>	<b>Water</b>	<b>Sampled: 11/21/2023 00:00</b>	<b>Specific Method</b> <span style="float: right;">005</span>
Radium Total (sub)		05/19/2024 00:00	EPA 904.0 Radium Sum C
Radium 228 (sub)		05/19/2024 00:00	EPA 904.0 Radium Sum C
Radium 226 (sub)		05/19/2024 00:00	EPA 903.1

**SAMPLE STATE OF ORIGIN**     Ky     **RUSH MULTIPLIER**     0    

**WO# : 30642421**

PM: SMB Due Date: 12/19/23  
 CLIENT: PACE\_44\_MVKY

Released By     *[Signature]*     Date     11/27/23     Received By     *[Signature]*     Date     11/28/23     940

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



DC#\_Title: ENV-FRM-GBUR-0088 v06\_Sample Condition Upon Receipt-  
Pittsburgh

WO#: 30642421

Effective Date: 09/20/2023

PM: SMB

Due Date: 12/19/23

Client Name: Pace-KY

CLIENT: PACE\_44\_MVKY

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Initial / Date

Tracking Number: 1Z0674570140970556  
1Z0674570142277347

Examined By: ps 11/28/23

Custody Seal on Cooler/Box Present:  Yes  No Seals Intact:  Yes  No

Labeled By: ps 11/28/23

Thermometer Used: \_\_\_\_\_ Type of Ice: Wet Blue None

Temped By: \_\_\_\_\_

Cooler Temperature: Observed Temp \_\_\_\_\_ °C Correction Factor: \_\_\_\_\_ °C Final Temp: \_\_\_\_\_ °C

Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot# <u>1000831</u>	D.P.D. Residual Chlorine Lot # _____
Chain of Custody Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.	
Chain of Custody Filled Out: -Were client corrections present on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.	<u>bottle caps say 13:40 for times no times on labels.</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous samples field filtered:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for dissolved tests:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.	
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	
All containers meet method preservation requirements: <u>ps 11/28/23</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed <u>PS 11/28/23</u>	Date/Time of Preservation <u>11/28/23 17:00</u>
8260C/D: Headspace in VOA Vials (> 6mm)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lot# of added Preservative <u>43080063</u>	<u>added 5.0 mL HNO3 to all bottles</u>
624.1: Headspace in VOA Vials (0mm)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.	
Rad Samples Screened <.05 mrem/hr.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trip blank custody seal present? YES or NO	
Comments:				Initial when completed <u>PS</u>	Date: <u>11/28/23</u>
<u>* Received without COC. 11/28/23 9:40 - ps 11/28/23</u>				Survey Meter SN: <u>25014380</u>	

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.



## Certificate of Analysis 3112057

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 12/20/2023 14:18

Project Name: HMPL Surface Impoundment

Workorder: 3112057

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/20/2023 16:13.

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](http://www.pacelabs.com)

### SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
--------	------------------------	--------	----------------	---------------	------------

3112057-02	MW8/	Groundwater	11/20/2023 13:47	11/20/2023 16:13	Kaelyn Sperle
------------	------	-------------	------------------	------------------	---------------

<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>
3112057-02	Field Conductance	2295
	Field Dissolved Oxygen	2.56
	Field pH	7.08
	Field Temp (C)	15.5
	Field Turbidity	4.17



**ANALYTICAL RESULTS**

Lab Sample ID: **3112057-02**  
 Description: **MW8**

Sample Collection Date Time: 11/20/2023 13:47  
 Sample Received Date Time: 11/20/2023 16:13

**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	11/30/2023 09:08	11/30/2023 17:14	AKB
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
Beryllium	ND	M2, U	mg/L	0.0020	0.0010	SW846-6020 A	11/30/2023 09:08	12/01/2023 16:40	AKB
<b>Boron</b>	<b>1.49</b>	D1, M1, M2	mg/L	1.00	1.00	SW846 6010 B	11/30/2023 09:08	12/01/2023 11:53	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
<b>Calcium</b>	<b>251</b>	D1, M1, M3	mg/L	40.0	13.0	SW846 6010 B	11/30/2023 09:08	12/01/2023 11:56	MRWD
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
<b>Lithium</b>	<b>0.03</b>	M2	mg/L	0.02	0.005	SW846-6020 A	11/30/2023 09:08	12/01/2023 16:40	AKB
Mercury	ND	M1, Y2, U	mg/L	0.0005	0.0002	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	11/30/2023 09:08	11/30/2023 17:14	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.64</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>1780</b>		mg/L	250	250	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.599</b>	_Sub	pCi/L			EPA 903.1	12/20/2023 11:55	12/20/2023 11:55	RCW
<b>See Attached Subcontract Report</b>	<b>1.22</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:55	12/20/2023 11:55	RCW
<b>Radium</b>	<b>1.82</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:55	12/20/2023 11:55	RCW
<b>See Attached Subcontract Report</b>	<b>1.82</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/20/2023 11:55	12/20/2023 11:55	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>46.5</b>	M2	mg/L	0.5	0.4	SW846 9056	11/28/2023 15:04	11/28/2023 15:04	CSC
<b>Fluoride</b>	<b>0.4</b>	M2	mg/L	0.2	0.2	SW846 9056	11/28/2023 15:04	11/28/2023 15:04	CSC
<b>Sulfate</b>	<b>1600</b>	D, M1	mg/L	10	5	SW846 9056	11/28/2023 15:32	11/28/2023 15:32	CSC



**Notes for work order 3112057**

- 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
- H3 Sample received and analyzed past holding time.
- 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.
- T17 Sample receipt temperature outside 0 - 6°C; sample collected on same day as receipt; sample not received on ice; client gave permission to proceed as documented on the COC or the project manager notified to contact client before proceeding.
- 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).
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

- 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



**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
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**Batch BCK2456 - EPA 200.2**

**Blank (BCK2456-BLK1)**

Prepared: 11/30/2023 9:08, Analyzed: 11/30/2023 17:06

Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Boron	ND	0.10	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Calcium	ND	0.40	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
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**Blank (BCK2456-BLK2)**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 16:33

Beryllium	ND	0.0020	mg/L							U
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**Blank (BCK2456-BLK3)**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 11:21

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U

**LCS (BCK2456-BS1)**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 11:34

Boron	0.12	0.10	mg/L	0.125		99.0	85-115			
Antimony	0.065	0.005	mg/L	0.0625		103	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		102	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		105	85-115			
Calcium	6.14	0.40	mg/L	6.25		98.3	85-115			
Arsenic	0.0620	0.0010	mg/L	0.0625		99.2	85-115			
Barium	0.060	0.004	mg/L	0.0625		96.5	85-115			
Beryllium	0.0531	0.0020	mg/L	0.0625		84.9	85-115			L2
Cadmium	0.0610	0.0010	mg/L	0.0625		97.6	85-115			
Chromium	0.0632	0.0020	mg/L	0.0625		101	85-115			
Cobalt	0.062	0.004	mg/L	0.0625		99.6	85-115			
Lead	0.062	0.002	mg/L	0.0625		98.7	85-115			
Lithium	0.05	0.02	mg/L	0.0625		85.0	85-115			
Selenium	0.060	0.003	mg/L	0.0625		95.2	85-115			
Thallium	0.0622	0.0020	mg/L	0.0625		99.5	85-115			





**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
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**Batch BCK2456 - EPA 200.2**

**LCS (BCK2456-BS2)**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 16:37

Beryllium	0.0599	0.0020	mg/L	0.0625		95.8	85-115			
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**LCS (BCK2456-BS3)**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 11:34

Boron	0.12	0.10	mg/L	0.125		99.0	85-115			
Calcium	6.14	0.40	mg/L	6.25		98.3	85-115			

**Matrix Spike (BCK2456-MS1)**

Source: 3112057-02

Prepared: 11/30/2023 9:08, Analyzed: 11/30/2023 18:19

Mercury	0.0033	0.0005	mg/L	0.00250	ND	133	80-120			M1
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120			
Boron	1.58	1.00	mg/L	0.125	1.49	65.6	80-120			D2, M2
Molybdenum	0.08	0.01	mg/L	0.0625	0.01	107	80-120			
Calcium	264	4.00	mg/L	6.25	251	199	80-120			D2, M1
Arsenic	0.0669	0.0010	mg/L	0.0625	ND	107	80-120			
Barium	0.076	0.004	mg/L	0.0625	0.016	96.9	80-120			
Beryllium	0.0454	0.0020	mg/L	0.0625	ND	72.7	80-120			M2
Cadmium	0.0591	0.0010	mg/L	0.0625	ND	94.6	80-120			
Chromium	0.0638	0.0020	mg/L	0.0625	ND	102	80-120			
Cobalt	0.062	0.004	mg/L	0.0625	ND	99.2	80-120			
Lead	0.060	0.002	mg/L	0.0625	ND	95.5	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.03	62.2	80-120			M2
Selenium	0.064	0.003	mg/L	0.0625	ND	102	80-120			
Thallium	0.0599	0.0020	mg/L	0.0625	ND	95.8	80-120			

**Matrix Spike (BCK2456-MS2)**

Source: 3114432-19

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:21

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Mercury	0.0026	0.0005	mg/L	0.00250	ND	103	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120			
Antimony	0.066	0.005	mg/L	0.0625	ND	105	80-120			
Calcium	65.6	4.00	mg/L	6.25	59.1	104	80-120			D2
Arsenic	0.0624	0.0010	mg/L	0.0625	0.0004	99.2	80-120			
Barium	0.084	0.004	mg/L	0.0625	0.022	99.1	80-120			
Beryllium	0.0481	0.0020	mg/L	0.0625	ND	76.9	80-120			M2
Cadmium	0.0609	0.0010	mg/L	0.0625	ND	97.4	80-120			
Chromium	0.0631	0.0020	mg/L	0.0625	ND	101	80-120			
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.2	80-120			
Lead	0.061	0.002	mg/L	0.0625	ND	97.6	80-120			
Lithium	0.05	0.02	mg/L	0.0625	ND	76.9	80-120			M2
Selenium	0.059	0.003	mg/L	0.0625	ND	95.0	80-120			
Thallium	0.0617	0.0020	mg/L	0.0625	ND	98.7	80-120			



**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
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**Batch BCK2456 - EPA 200.2**

**Matrix Spike (BCK2456-MS3) Source: 3112057-02**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:15

Boron	1.58	1.00	mg/L	0.125	1.49	65.6	80-120			
Calcium	264	4.00	mg/L	6.25	251	199	80-120			D2, M3

**Matrix Spike (BCK2456-MS4) Source: 3114432-19**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:21

Boron	ND	1.00	mg/L	0.125	ND		80-120			U
Calcium	65.6	4.00	mg/L	6.25	59.1	104	80-120			D2

**Matrix Spike Dup (BCK2456-MSD1) Source: 3112057-02**

Prepared: 11/30/2023 9:08, Analyzed: 11/30/2023 18:41

Molybdenum	0.08	0.01	mg/L	0.0625	0.01	105	80-120	1.60	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	101	80-120	27.0	20	Y2
Boron	1.62	1.00	mg/L	0.125	1.49	99.0	80-120	2.61	20	D2
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120	0.0688	20	
Calcium	273	4.00	mg/L	6.25	251	345	80-120	3.41	20	D2, M1
Arsenic	0.0651	0.0010	mg/L	0.0625	ND	104	80-120	2.74	20	
Barium	0.076	0.004	mg/L	0.0625	0.016	96.1	80-120	0.707	20	
Beryllium	0.0446	0.0020	mg/L	0.0625	ND	71.4	80-120	1.71	20	M2
Cadmium	0.0588	0.0010	mg/L	0.0625	ND	94.1	80-120	0.565	20	
Chromium	0.0622	0.0020	mg/L	0.0625	ND	99.5	80-120	2.51	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	96.8	80-120	2.41	20	
Lead	0.059	0.002	mg/L	0.0625	ND	94.6	80-120	0.991	20	
Lithium	0.07	0.02	mg/L	0.0625	0.03	63.9	80-120	1.51	20	M2
Selenium	0.063	0.003	mg/L	0.0625	ND	101	80-120	0.642	20	
Thallium	0.0596	0.0020	mg/L	0.0625	ND	95.3	80-120	0.468	20	

**Matrix Spike Dup (BCK2456-MSD2) Source: 3114432-19**

Prepared: 11/30/2023 9:08, Analyzed: 11/30/2023 18:48

Molybdenum	0.07	0.01	mg/L	0.0625	ND	106	80-120	0.314	20	
Antimony	0.066	0.005	mg/L	0.0625	ND	105	80-120	0.0381	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	102	80-120	1.30	20	
Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	63.3	4.00	mg/L	6.25	59.1	67.7	80-120	3.49	20	D2
Arsenic	0.0632	0.0010	mg/L	0.0625	0.0004	100	80-120	1.23	20	
Barium	0.082	0.004	mg/L	0.0625	0.022	95.5	80-120	2.66	20	
Beryllium	0.0492	0.0020	mg/L	0.0625	ND	78.7	80-120	2.36	20	M2
Cadmium	0.0608	0.0010	mg/L	0.0625	ND	97.3	80-120	0.134	20	
Chromium	0.0634	0.0020	mg/L	0.0625	ND	101	80-120	0.416	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	97.5	80-120	0.243	20	
Lead	0.061	0.002	mg/L	0.0625	ND	97.1	80-120	0.608	20	
Lithium	0.05	0.02	mg/L	0.0625	ND	77.0	80-120	0.198	20	M2
Selenium	0.059	0.003	mg/L	0.0625	ND	94.8	80-120	0.110	20	
Thallium	0.0616	0.0020	mg/L	0.0625	ND	98.5	80-120	0.136	20	



**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
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**Batch BCK2456 - EPA 200.2**

**Matrix Spike Dup (BCK2456-MSD3) Source: 3112057-02**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:18

Boron	1.62	1.00	mg/L	0.125	1.49	99.0	80-120	2.61	20	
Calcium	273	4.00	mg/L	6.25	251	345	80-120	3.41	20	D2, M3

**Matrix Spike Dup (BCK2456-MSD4) Source: 3114432-19**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:24

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	U
Calcium	63.3	4.00	mg/L	6.25	59.1	67.7	80-120	3.49	20	D2

**Post Spike (BCK2456-PS1) Source: 3112057-02**

Prepared: 11/30/2023 9:08, Analyzed: 11/30/2023 18:52

Antimony	61.3		ug/L	62.5	0.083	98.0	75-125			
Molybdenum	77.6		ug/L	62.5	13.7	102	75-125			
Mercury	2.53		ug/L	2.50	0.0652	98.7	75-125			
Boron	1660		ug/L	125	1490	132	75-125			D2, M1
Calcium	281000		ug/L	6250	251000	471	75-125			D2, M1
Arsenic	63.3		ug/L	62.5	0.0410	101	75-125			
Barium	74.4		ug/L	62.5	15.8	93.9	75-125			
Beryllium	42.9		ug/L	62.5	0.201	68.3	75-125			M2
Cadmium	56.2		ug/L	62.5	0.0305	89.8	75-125			
Chromium	60.0		ug/L	62.5	0.441	95.3	75-125			
Cobalt	58.4		ug/L	62.5	0.018	93.5	75-125			
Lead	57.3		ug/L	62.5	0.023	91.6	75-115			
Lithium	65.6		ug/L	62.5	28.0	60.1	75-125			M2
Selenium	61.7		ug/L	62.5	0.094	98.6	75-125			
Thallium	57.7		ug/L	62.5	0.0565	92.2	75-125			

**Post Spike (BCK2456-PS2) Source: 3112057-02**

Prepared: 11/30/2023 9:08, Analyzed: 12/1/2023 14:27

Boron	1660		ug/L	125	1490	132	75-125			
Calcium	281000		ug/L	6250	251000	471	75-125			D2, M3



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch BCK1701 - Default Prep Micro

LCS (BCK1701-BS1)

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
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LCS (BCK1701-BS2)

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
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Duplicate (BCK1701-DUP1) Source: 3113381-03

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	8.04	0.10	Std. Units		8.04			0.00	10	H3
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Duplicate (BCK1701-DUP2) Source: 3114321-03

Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08

pH (Lab)	9.01	0.10	Std. Units		8.97			0.445	10	H3
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Batch BCK2067 - Default Prep Wet Chem

Blank (BCK2067-BLK1)

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	ND	25	mg/L							U
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LCS (BCK2067-BS1)

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	1500	25	mg/L	1500		99.7	80-120			
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Duplicate (BCK2067-DUP1) Source: 3112057-02

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	1850	250	mg/L		1780			3.86	10	
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Duplicate (BCK2067-DUP2) Source: 3114323-01

Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30

Total Dissolved Solids	400	50	mg/L		408			1.98	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
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**Batch BCK2359 - Default Prep IC**

**Blank (BCK2359-BLK1)**

Prepared: 11/28/2023 23:18, Analyzed: 11/28/2023 23:18

Chloride	ND	0.5	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U

**Blank (BCK2359-BLK2)**

Prepared: 11/28/2023 22:50, Analyzed: 11/29/2023 15:23

Chloride	ND	0.5	mg/L							U
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**LCS (BCK2359-BS1)**

Prepared: 11/28/2023 22:50, Analyzed: 11/28/2023 22:50

Chloride	11.1		mg/L	12.5		89.2	90-110			L2
Fluoride	4.7		mg/L	5.00		93.9	90-110			
Sulfate	23		mg/L	25.0		90.7	90-110			

**LCS (BCK2359-BS2)**

Prepared: 11/28/2023 22:50, Analyzed: 11/29/2023 14:55

Chloride	12.9		mg/L	12.5		103	90-110			
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**Matrix Spike (BCK2359-MS1) Source: 3112057-02**

Prepared: 11/28/2023 21:28, Analyzed: 11/28/2023 21:28

Fluoride	2.4		mg/L	5.00	0.4	41.8	75-125			M2
Chloride	48.1		mg/L	12.5	41.9	49.9	75-125			M2
Sulfate	988		mg/L	25.0	1440	NR	75-125			M1

**Matrix Spike (BCK2359-MS2) Source: 3113381-01**

Prepared: 11/28/2023 23:45, Analyzed: 11/28/2023 23:45

Chloride	25.0		mg/L	12.5	15.9	73.1	75-125			M2
Fluoride	5.1		mg/L	5.00	0.3	96.1	75-125			
Sulfate	260		mg/L	25.0	361	NR	75-125			M1

**Matrix Spike (BCK2359-MS3) Source: 3113381-02**

Prepared: 11/29/2023 0:40, Analyzed: 11/29/2023 0:40

Chloride	28.8		mg/L	12.5	16.3	100	75-125			
Fluoride	6.8		mg/L	5.00	0.4	129	75-125			M1
Sulfate	31		mg/L	25.0	2	116	75-125			



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK2359 - Default Prep IC**

**Matrix Spike (BCK2359-MS4) Source: 3113381-03**

Prepared: 11/29/2023 1:35, Analyzed: 11/29/2023 1:35

Chloride	22.7		mg/L	12.5	9.8	104	75-125			
Fluoride	6.5		mg/L	5.00	0.3	123	75-125			
Sulfate	49		mg/L	25.0	22	109	75-125			

**Matrix Spike Dup (BCK2359-MSD1) Source: 3112057-02**

Prepared: 11/28/2023 21:55, Analyzed: 11/28/2023 21:55

Chloride	48.2		mg/L	12.5	41.9	50.5	75-125	0.145	15	M2
Fluoride	2.6		mg/L	5.00	0.4	45.5	75-125	7.24	15	M2
Sulfate	991		mg/L	25.0	1440	NR	75-125	0.291	15	M1

**Matrix Spike Dup (BCK2359-MSD2) Source: 3113381-01**

Prepared: 11/29/2023 0:13, Analyzed: 11/29/2023 0:13

Chloride	25.2		mg/L	12.5	15.9	75.0	75-125	0.939	15	
Fluoride	5.1		mg/L	5.00	0.3	95.2	75-125	0.865	15	
Sulfate	261		mg/L	25.0	361	NR	75-125	0.325	15	M1

**Matrix Spike Dup (BCK2359-MSD3) Source: 3113381-02**

Prepared: 11/29/2023 1:07, Analyzed: 11/29/2023 1:07

Fluoride	6.1		mg/L	5.00	0.4	113	75-125	11.8	15	
Chloride	27.6		mg/L	12.5	16.3	90.0	75-125	4.45	15	
Sulfate	28		mg/L	25.0	2	102	75-125	11.5	15	

**Matrix Spike Dup (BCK2359-MSD4) Source: 3113381-03**

Prepared: 11/29/2023 2:02, Analyzed: 11/29/2023 2:02

Chloride	23.3		mg/L	12.5	9.8	108	75-125	2.55	15	
Fluoride	6.9		mg/L	5.00	0.3	131	75-125	6.15	15	M1
Sulfate	50		mg/L	25.0	22	115	75-125	2.67	15	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)



**Sample Acceptance Checklist for Work Order 3112057**

Shipped By: Client

Temperature: 16.70° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 11/20/2023



**Client:** Big Rivers Electric Corporation  
Reid/Green Station

**Report To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project:** HMPL Surface Impoundment

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Sperte  
\*required information

Compliance Monitoring? Yes \_\_\_ 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 # Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-01 F			Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-02 A	<u>11/20/23</u>	<u>1347</u>	Plastic 500mL pH<2 w/HNO3	1	MW8	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-02 B	<u>11/20/23</u>	<u>1347</u>	Plastic 1L	1	MW8	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3112057-02 C	<u>11/20/23</u>	<u>1347</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			
3112057-02 D	<u>11/20/23</u>	<u>1347</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
				Preservation Check: pH: <input checked="" type="checkbox"/>			

Preservation Check Performed by: MAX

MW-8  
Field data collected by: Kaelyn Sperte Date (mm/dd/yy) 11/20/23 Time (24 hr) 1347  
pH 7.08 Cond (µmho/cm) 2.295 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.5 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 2.56 Turb. (NTU) 4.17  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Kaelyn Sperte Received by: (Signature) [Signature] Date (mm/dd/yy) 11/20/23 Time (24 hr) 1613



# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#: \_\_\_\_\_  
Quote# \_\_\_\_\_

**Please Print Legibly**

Collected by (Signature): Kaelyn Orle  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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 # 3112057 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3112057-02 E	<u>11/20/23</u>	<u>1347</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1 ✓	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH: _____				
3112057-02 F	<u>11/20/23</u>	<u>1347</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1 ✓	MW8	g / c	Radium Total (sub)
			Preservation Check: pH: _____				
3112057-03 A	_____	_____	Plastic 500mL pH<2 w/HNO3	1 ✓	MW9	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: _____				
3112057-03 B	_____	_____	Plastic 1L	1	MW9	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3112057-03 C	_____	_____	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1 ✓	MW9	g / c	Radium 226 (sub)
			Preservation Check: pH: _____				
							Thermometer Serial Number <u>181390287</u> <u>181460057</u> Temp <u>6.7</u> °C.

Preservation Check Performed by: MAK

Field data collected by: _____	Date (mm/dd/yy) _____	Time (24 hr) _____
pH _____	Cond (umho) _____	Res Cl (mg/L) _____
Temp (oC) _____	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Kaelyn Orle</u>	Received by: (Signature) <u>[Signature]</u>	Date (mm/dd/yy) <u>11/20/23</u>	Time (24 hr) <u>1613</u>
--	--	------------------------------------	-----------------------------



December 19, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3112057  
Pace Project No.: 30642435

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2023. 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,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 3112057  
 Pace Project No.: 30642435

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3112057  
Pace Project No.: 30642435

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30642435001	3112057-02	Water	11/20/23 13:47	11/28/23 09:40

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 3112057  
Pace Project No.: 30642435

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30642435001	3112057-02	EPA 903.1	CLM	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: 3112057  
 Pace Project No.: 30642435

**Sample: 3112057-02**      **Lab ID: 30642435001**      Collected: 11/20/23 13:47      Received: 11/28/23 09:40      Matrix: Water  
 PWS:      Site ID:      Sample Type:

Comments: • 11/28/23 @ 17:00 - Added 5ml HNO3 to RAD bottle prior to analysis. pH <2.  
 • Collection time not listed on sample labels, matches what is written on bottle cap  
 • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	<b>0.599 ± 0.484 (0.703)</b> <b>C:NA T:90%</b>	pCi/L	12/18/23 12:20	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	<b>1.22 ± 0.582 (1.02)</b> <b>C:74% T:83%</b>	pCi/L	12/12/23 14:57	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	<b>1.82 ± 1.07 (1.72)</b>	pCi/L	12/19/23 13:39	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3112057  
 Pace Project No.: 30642435

QC Batch: 632704	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30642435001

METHOD BLANK: 3084337 Matrix: Water

Associated Lab Samples: 30642435001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.462 ± 0.415 (0.840) C:81% T:73%	pCi/L	12/12/23 14:58	

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: 3112057  
 Pace Project No.: 30642435

QC Batch: 632703	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30642435001

METHOD BLANK: 3084336 Matrix: Water

Associated Lab Samples: 30642435001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0768 ± 0.175 (0.282) C:NA T:95%	pCi/L	12/18/23 11:55	

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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## QUALIFIERS

Project: 3112057  
Pace Project No.: 30642435

### 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.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

**SUBCONTRACT ORDER**  
**Pace Analytical Services, LLC Kentucky**  
**3112057**

**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: 3112057-02      Water      Sampled: 11/20/2023 13:47      Specific Method			001
Radium Total (sub)	05/18/2024 13:47	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/18/2024 13:47	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/18/2024 13:47	EPA 903.1	

SAMPLE STATE OF ORIGIN     Ky          RUSH MULTIPLIER     0    

**WO# : 30642435**  
  
 30642435

Received by Pace Greensburg  
 Therm ID \_\_\_\_\_ Corr Factor +/- \_\_\_\_\_  
 Receipt Temp \_\_\_\_\_  
 Corrected Temp \_\_\_\_\_  
 Correct Preservation Y/N

Released By     *[Signature]*          Date     11/27/23          Received By     *[Signature]*          Date     11/28/23          940

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

DC#\_Title: ENV-FRM-GBUR-0088 v06\_Sample Condition Upon Receipt-  
Pittsburgh

Effective Date: 09/20/2023



**WO# : 30642435**

PM: SMB Due Date: 12/19/23  
CLIENT: PACE\_44\_MVKY

Client Name: Pace - KY

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other  
Tracking Number: 1Z067457 01 4227 7347

Examined By: PS 11/28/23  
Labeled By: PS 11/28/23  
Temped By: \_\_\_\_\_

Custody Seal on Cooler/Box Present:  Yes  No Seals Intact:  Yes  No  
Thermometer Used: \_\_\_\_\_ Type of Ice: Wet Blue None

Cooler Temperature: Observed Temp \_\_\_\_\_ °C Correction Factor: \_\_\_\_\_ °C Final Temp: \_\_\_\_\_ °C  
Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot#	D.P.D. Residual Chlorine Lot #
				1000831	
Chain of Custody Present	/			1.	
Chain of Custody Filled Out: -Were client corrections present on COC	/			2.	
Chain of Custody Relinquished	/			3.	
Sampler Name & Signature on COC:	/			4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	/			5.	<u>bottle caps say 16=45 time on bottles match COC</u>
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 samples field filtered:			/	13.	
Organic Samples checked for dechlorination			/	14.	
Filtered volume received for dissolved tests:			/	15.	
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	/			16.	<u>PS 11/28/23 added 5.0 mL HNO<sub>3</sub> to RHC<sub>2</sub> all bottles</u>
All containers meet method preservation requirements:	<input checked="" type="checkbox"/>	/		Initial when completed <u>PS</u>	Date/Time of Preservation <u>11/28/23 17:00</u>
				Lot# of added Preservative <u>43080063</u>	
8260C/D: Headspace in VOA Vials (> 6mm)			/	17.	
624.1: Headspace in VOA Vials (0mm)			/	18.	
Trip Blank Present:			/	Trip blank custody seal present? YES or NO	
Rad Samples Screened <.05 mrem/hr.	/			Initial when completed <u>PS</u>	Date: <u>11/28/23</u> Survey Meter SN: <u>25014380</u>
Comments:					

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.



## Certificate of Analysis 3113381

Mark Bertram  
Big Rivers Electric Corporation Reid/Green Station  
9000 Highway 2096  
Robards, KY 42452

Customer ID: 44-102032  
Report Printed: 12/11/2023 15:02

Project Name: HMPL Surface Impoundment Characterization Wells	Workorder: 3113381
---	--------------------

Dear Mark Bertram

Enclosed are the analytical results for samples received by the laboratory 11/20/2023 16:13.

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.*



**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
3113381-01	MW-110/	Groundwater	11/20/2023 14:58	11/20/2023 16:13	Kaelyn Sperle
3113381-02	MW-111/	Groundwater	11/20/2023 12:43	11/20/2023 16:13	Kaelyn Sperle
3113381-03	MW-112/	Groundwater	11/20/2023 11:37	11/20/2023 16:13	Kaelyn Sperle
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
3113381-01	Field Conductance				979
	Field Dissolved Oxygen				2.06
	Field pH				7.15
	Field Temp (C)				15.4
	Field Turbidity				47.27
3113381-02	Field Conductance				484
	Field Dissolved Oxygen				1.81
	Field pH				7.94
	Field Temp (C)				15.6
	Field Turbidity				15.56
3113381-03	Field Conductance				466
	Field Dissolved Oxygen				2.04
	Field pH				7.50
	Field Temp (C)				15.7
	Field Turbidity				53.12



**ANALYTICAL RESULTS**

Lab Sample ID: **3113381-01**  
 Description: **MW-110**

Sample Collection Date Time: 11/20/2023 14:58  
 Sample Received Date Time: 11/20/2023 16:13

**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	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Arsenic</b>	<b>0.0006</b>	J	mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Barium</b>	<b>0.046</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Boron</b>	<b>0.56</b>	M2	mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	12/01/2023 11:44	MRWD
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Calcium</b>	<b>105</b>	D1, M3	mg/L	40.0	13.0	SW846 6010 B	11/27/2023 08:58	11/29/2023 16:20	MRWD
<b>Chromium</b>	<b>0.0028</b>		mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Lead</b>	<b>0.001</b>	J	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
<b>Lithium</b>	<b>0.01</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Mercury	ND	M1, Y2, U	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:45	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>7.70</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>824</b>		mg/L	100	100	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.148</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.663</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.811</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.811</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>17.6</b>	M2	mg/L	0.5	0.4	SW846 9056	11/28/2023 15:59	11/28/2023 15:59	CSC
<b>Fluoride</b>	<b>0.3</b>		mg/L	0.2	0.2	SW846 9056	11/28/2023 15:59	11/28/2023 15:59	CSC
<b>Sulfate</b>	<b>401</b>	D, M1	mg/L	5	2	SW846 9056	11/28/2023 16:26	11/28/2023 16:26	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3113381-02**  
 Description: **MW-111**

Sample Collection Date Time: 11/20/2023 12:43  
 Sample Received Date Time: 11/20/2023 16:13

**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	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Arsenic</b>	<b>0.0011</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Barium</b>	<b>1.03</b>	D1	mg/L	0.040	0.010	SW846-6020 A	11/27/2023 08:58	11/28/2023 18:56	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Boron</b>	<b>0.57</b>		mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	12/01/2023 11:47	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Calcium</b>	<b>16.6</b>	D1	mg/L	4.00	1.30	SW846 6010 B	11/27/2023 08:58	11/29/2023 16:26	MRWD
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Lithium</b>	<b>0.008</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:48	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.31</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>292</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.784</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.924</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>1.71</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>1.71</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>18.2</b>		mg/L	0.5	0.4	SW846 9056	11/28/2023 16:54	11/28/2023 16:54	CSC
<b>Fluoride</b>	<b>0.4</b>	M1	mg/L	0.2	0.2	SW846 9056	11/28/2023 16:54	11/28/2023 16:54	CSC
<b>Sulfate</b>	<b>2</b>		mg/L	1	0.5	SW846 9056	11/28/2023 16:54	11/28/2023 16:54	CSC



**ANALYTICAL RESULTS**

Lab Sample ID: **3113381-03**  
 Description: **MW-112**

Sample Collection Date Time: 11/20/2023 11:37  
 Sample Received Date Time: 11/20/2023 16:13

**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	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Arsenic</b>	<b>0.0018</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Barium</b>	<b>0.331</b>		mg/L	0.004	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Boron</b>	<b>0.37</b>		mg/L	0.10	0.10	SW846 6010 B	11/27/2023 08:58	11/30/2023 15:19	MRWD
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Calcium</b>	<b>27.6</b>	D1	mg/L	4.00	1.30	SW846 6010 B	11/27/2023 08:58	11/29/2023 16:45	MRWD
<b>Chromium</b>	<b>0.0021</b>		mg/L	0.0020	0.0006	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
Cobalt	ND	u	mg/L	0.004	0.004	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Lead</b>	<b>0.0006</b>	J	mg/L	0.002	0.0005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Lithium</b>	<b>0.007</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
<b>Molybdenum</b>	<b>0.006</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/27/2023 08:58	11/27/2023 14:52	AKB

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>pH (Lab)</b>	<b>8.04</b>	H3	Std. Units	0.10	0.10	SM 4500-H+ B-2011	11/21/2023 08:46	11/21/2023 15:08	AED
<b>Total Dissolved Solids</b>	<b>278</b>		mg/L	50	50	2540 C-2015	11/22/2023 17:30	11/22/2023 17:30	HAG

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>See Attached Subcontract Report</b>	<b>0.341</b>	_Sub	pCi/L			EPA 903.1	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.224</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>Radium</b>	<b>0.565</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW
<b>See Attached Subcontract Report</b>	<b>0.565</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/11/2023 14:13	12/11/2023 14:14	RCW

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>10.9</b>		mg/L	0.5	0.4	SW846 9056	11/28/2023 17:48	11/28/2023 17:48	CSC
<b>Fluoride</b>	<b>0.3</b>	M1	mg/L	0.2	0.2	SW846 9056	11/28/2023 17:48	11/28/2023 17:48	CSC
<b>Sulfate</b>	<b>24</b>		mg/L	1	0.5	SW846 9056	11/28/2023 17:48	11/28/2023 17:48	CSC





**Notes for work order 3113381**

- 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
- H3 Sample received and analyzed past holding time.
- J Estimated value.
- 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.
- T17 Sample receipt temperature outside 0 - 6°C; sample collected on same day as receipt; sample not received on ice; client gave permission to proceed as documented on the COC or the project manager notified to contact client before proceeding.
- 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).
- Y2 MS/MSD RPD exceeded the method control limit. Recovery met acceptance criteria.

**Standard Qualifiers/Acronyms**

- 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



**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
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**Batch BCK2072 - EPA 200.2**

**Blank (BCK2072-BLK1)**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 14:37

Antimony	ND	0.005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	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
Lead	ND	0.002	mg/L							U
Lithium	ND	0.02	mg/L							U
Selenium	ND	0.003	mg/L							U
Thallium	ND	0.0020	mg/L							U

**Blank (BCK2072-BLK2)**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 16:04

Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U

**LCS (BCK2072-BS1)**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 14:41

Antimony	0.062	0.005	mg/L	0.0625		98.6	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		99.0	85-115			
Molybdenum	0.06	0.01	mg/L	0.0625		101	85-115			
Arsenic	0.0619	0.0010	mg/L	0.0625		99.1	85-115			
Barium	0.061	0.004	mg/L	0.0625		97.8	85-115			
Beryllium	0.0562	0.0020	mg/L	0.0625		89.9	85-115			
Cadmium	0.0610	0.0010	mg/L	0.0625		97.6	85-115			
Chromium	0.0611	0.0020	mg/L	0.0625		97.7	85-115			
Cobalt	0.060	0.004	mg/L	0.0625		96.7	85-115			
Lead	0.058	0.002	mg/L	0.0625		93.4	85-115			
Lithium	0.06	0.02	mg/L	0.0625		88.8	85-115			
Selenium	0.061	0.003	mg/L	0.0625		97.1	85-115			
Thallium	0.0595	0.0020	mg/L	0.0625		95.2	85-115			



**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
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**Batch BCK2072 - EPA 200.2**

**LCS (BCK2072-BS2)**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 16:07

Boron	0.13	0.10	mg/L	0.125		108	85-115			
Calcium	6.15	0.40	mg/L	6.25		98.3	85-115			

**Matrix Spike (BCK2072-MS1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:35

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			
Mercury	0.0033	0.0005	mg/L	0.00250	ND	131	80-120			M1
Antimony	0.062	0.005	mg/L	0.0625	ND	99.8	80-120			
Arsenic	0.0651	0.0010	mg/L	0.0625	0.0006	103	80-120			
Barium	0.110	0.004	mg/L	0.0625	0.046	102	80-120			
Beryllium	0.0538	0.0020	mg/L	0.0625	ND	86.1	80-120			
Cadmium	0.0618	0.0010	mg/L	0.0625	ND	98.8	80-120			
Chromium	0.0654	0.0020	mg/L	0.0625	0.0028	100	80-120			
Cobalt	0.062	0.004	mg/L	0.0625	ND	98.7	80-120			
Lead	0.059	0.002	mg/L	0.0625	0.001	93.1	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.01	85.2	80-120			
Selenium	0.062	0.003	mg/L	0.0625	ND	98.8	80-120			
Thallium	0.0591	0.0020	mg/L	0.0625	ND	94.6	80-120			

**Matrix Spike (BCK2072-MS2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 17:58

Boron	ND	1.00	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	119	4.00	mg/L	6.25	105	232	80-120			D2, M3

**Matrix Spike Dup (BCK2072-MSD1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:39

Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120	0.239	20	
Mercury	0.0026	0.0005	mg/L	0.00250	ND	106	80-120	21.0	20	Y2
Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	1.64	20	
Arsenic	0.0650	0.0010	mg/L	0.0625	0.0006	103	80-120	0.143	20	
Barium	0.109	0.004	mg/L	0.0625	0.046	100	80-120	0.927	20	
Beryllium	0.0540	0.0020	mg/L	0.0625	ND	86.4	80-120	0.357	20	
Cadmium	0.0626	0.0010	mg/L	0.0625	ND	100	80-120	1.30	20	
Chromium	0.0649	0.0020	mg/L	0.0625	0.0028	99.3	80-120	0.842	20	
Cobalt	0.061	0.004	mg/L	0.0625	ND	98.2	80-120	0.545	20	
Lead	0.060	0.002	mg/L	0.0625	0.001	94.0	80-120	0.968	20	
Lithium	0.07	0.02	mg/L	0.0625	0.01	84.8	80-120	0.348	20	
Selenium	0.062	0.003	mg/L	0.0625	ND	99.3	80-120	0.578	20	
Thallium	0.0596	0.0020	mg/L	0.0625	ND	95.4	80-120	0.828	20	



**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
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**Batch BCK2072 - EPA 200.2**

**Matrix Spike Dup (BCK2072-MSD2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 18:01

Boron	ND	1.00	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	115	4.00	mg/L	6.25	105	155	80-120	4.08	20	D2, M3

**Post Spike (BCK2072-PS1) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/27/2023 15:42

Mercury	0.0026	0.0005	mg/L	0.00250	ND	105	75-125			
Antimony	0.055	0.005	mg/L	0.0625	ND	87.9	75-125			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	103	75-125			
Arsenic	0.0635	0.0010	mg/L	0.0625	0.0006	101	75-125			
Barium	0.107	0.004	mg/L	0.0625	0.046	96.7	75-125			
Beryllium	0.0520	0.0020	mg/L	0.0625	ND	83.2	75-125			
Cadmium	0.0608	0.0010	mg/L	0.0625	ND	97.2	75-125			
Chromium	0.0629	0.0020	mg/L	0.0625	0.0028	96.1	75-125			
Cobalt	0.060	0.004	mg/L	0.0625	ND	95.8	75-125			
Lead	0.058	0.002	mg/L	0.0625	0.001	91.2	75-115			
Lithium	0.07	0.02	mg/L	0.0625	0.01	82.3	75-125			
Selenium	0.061	0.003	mg/L	0.0625	ND	97.1	75-125			
Thallium	0.0581	0.0020	mg/L	0.0625	ND	93.0	75-125			

**Post Spike (BCK2072-PS2) Source: 3113381-01**

Prepared: 11/27/2023 8:58, Analyzed: 11/29/2023 18:04

Boron	ND	1.00	mg/L	0.125	ND		75-125			D2, M2, U
Calcium	114	4.00	mg/L	6.25	105	140	75-125			D2, M3



Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch BCK1701 - Default Prep Micro</b>										
<b>LCS (BCK1701-BS1)</b>										
Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08										
pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
<b>LCS (BCK1701-BS2)</b>										
Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08										
pH (Lab)	4.97		Std. Units	5.00		99.4	98.8-101.2			
<b>Duplicate (BCK1701-DUP1) Source: 3113381-03</b>										
Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08										
pH (Lab)	8.04	0.10	Std. Units		8.04			0.00	10	H3
<b>Duplicate (BCK1701-DUP2) Source: 3114321-03</b>										
Prepared: 11/21/2023 8:46, Analyzed: 11/21/2023 15:08										
pH (Lab)	9.01	0.10	Std. Units		8.97			0.445	10	H3
<b>Batch BCK2067 - Default Prep Wet Chem</b>										
<b>Blank (BCK2067-BLK1)</b>										
Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30										
Total Dissolved Solids	ND	25	mg/L							U
<b>LCS (BCK2067-BS1)</b>										
Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30										
Total Dissolved Solids	1500	25	mg/L	1500		99.7	80-120			
<b>Duplicate (BCK2067-DUP1) Source: 3112057-02</b>										
Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30										
Total Dissolved Solids	1850	250	mg/L		1780			3.86	10	
<b>Duplicate (BCK2067-DUP2) Source: 3114323-01</b>										
Prepared: 11/22/2023 17:30, Analyzed: 11/22/2023 17:30										
Total Dissolved Solids	400	50	mg/L		408			1.98	10	



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK2359 - Default Prep IC**

**Blank (BCK2359-BLK1)**

Prepared: 11/28/2023 23:18, Analyzed: 11/28/2023 23:18

Fluoride	ND	0.2	mg/L							U
Chloride	ND	0.5	mg/L							U
Sulfate	ND	1	mg/L							U

**Blank (BCK2359-BLK2)**

Prepared: 11/28/2023 22:50, Analyzed: 11/29/2023 15:23

Chloride	ND	0.5	mg/L							U
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**LCS (BCK2359-BS1)**

Prepared: 11/28/2023 22:50, Analyzed: 11/28/2023 22:50

Fluoride	4.7		mg/L	5.00		93.9	90-110			
Chloride	11.1		mg/L	12.5		89.2	90-110			L2
Sulfate	23		mg/L	25.0		90.7	90-110			

**LCS (BCK2359-BS2)**

Prepared: 11/28/2023 22:50, Analyzed: 11/29/2023 14:55

Chloride	12.9		mg/L	12.5		103	90-110			
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**Matrix Spike (BCK2359-MS1)**

Source: 3112057-02

Prepared: 11/28/2023 21:28, Analyzed: 11/28/2023 21:28

Chloride	48.1		mg/L	12.5	41.9	49.9	75-125			M2
Fluoride	2.4		mg/L	5.00	0.4	41.8	75-125			M2
Sulfate	988		mg/L	25.0	1440	NR	75-125			M1

**Matrix Spike (BCK2359-MS2)**

Source: 3113381-01

Prepared: 11/28/2023 23:45, Analyzed: 11/28/2023 23:45

Fluoride	5.1		mg/L	5.00	0.3	96.1	75-125			
Chloride	25.0		mg/L	12.5	15.9	73.1	75-125			M2
Sulfate	260		mg/L	25.0	361	NR	75-125			M1

**Matrix Spike (BCK2359-MS3)**

Source: 3113381-02

Prepared: 11/29/2023 0:40, Analyzed: 11/29/2023 0:40

Fluoride	6.8		mg/L	5.00	0.4	129	75-125			M1
Chloride	28.8		mg/L	12.5	16.3	100	75-125			
Sulfate	31		mg/L	25.0	2	116	75-125			



**Ion Chromatography Madisonville - Quality Control**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch BCK2359 - Default Prep IC**

**Matrix Spike (BCK2359-MS4) Source: 3113381-03**

Prepared: 11/29/2023 1:35, Analyzed: 11/29/2023 1:35

Chloride	22.7		mg/L	12.5	9.8	104	75-125			
Fluoride	6.5		mg/L	5.00	0.3	123	75-125			
Sulfate	49		mg/L	25.0	22	109	75-125			

**Matrix Spike Dup (BCK2359-MSD1) Source: 3112057-02**

Prepared: 11/28/2023 21:55, Analyzed: 11/28/2023 21:55

Fluoride	2.6		mg/L	5.00	0.4	45.5	75-125	7.24	15	M2
Chloride	48.2		mg/L	12.5	41.9	50.5	75-125	0.145	15	M2
Sulfate	991		mg/L	25.0	1440	NR	75-125	0.291	15	M1

**Matrix Spike Dup (BCK2359-MSD2) Source: 3113381-01**

Prepared: 11/29/2023 0:13, Analyzed: 11/29/2023 0:13

Chloride	25.2		mg/L	12.5	15.9	75.0	75-125	0.939	15	
Fluoride	5.1		mg/L	5.00	0.3	95.2	75-125	0.865	15	
Sulfate	261		mg/L	25.0	361	NR	75-125	0.325	15	M1

**Matrix Spike Dup (BCK2359-MSD3) Source: 3113381-02**

Prepared: 11/29/2023 1:07, Analyzed: 11/29/2023 1:07

Fluoride	6.1		mg/L	5.00	0.4	113	75-125	11.8	15	
Chloride	27.6		mg/L	12.5	16.3	90.0	75-125	4.45	15	
Sulfate	28		mg/L	25.0	2	102	75-125	11.5	15	

**Matrix Spike Dup (BCK2359-MSD4) Source: 3113381-03**

Prepared: 11/29/2023 2:02, Analyzed: 11/29/2023 2:02

Fluoride	6.9		mg/L	5.00	0.3	131	75-125	6.15	15	M1
Chloride	23.3		mg/L	12.5	9.8	108	75-125	2.55	15	
Sulfate	50		mg/L	25.0	22	115	75-125	2.67	15	

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2540 C-2015 in Water</b>	
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 MS Drinking Water MADV
<b>SM 4500-H+ B-2011 in Water</b>	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
<b>SW846 6010 B in Water</b>	
Calcium	VA NELAC MDV (460210)



**Sample Acceptance Checklist for Work Order 3113381**

Shipped By: Client

Temperature: 15.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Sperte  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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 # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3113381-01 A	<u>11/20/23 1458</u>	Plastic 500mL pH<2 w/HNO3	1	MW-110	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
		Preservation Check: pH: <u>✓</u>				
3113381-01 B	<u>11/20/23 1458</u>	Plastic 1L	1	MW-110	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056 Radium 226 (sub)
3113381-01 C	<u>11/20/23 1458</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-110	g / c	
		Preservation Check: pH: <u>✓</u>				
3113381-01 D	<u>11/20/23 1458</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
		Preservation Check: pH: <u>✓</u>				
3113381-01 E	<u>11/20/23 1458</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
		Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: MAK

Field data collected by: MW-110 Kaelyn Sperte Date (mm/dd/yy) 11/20/23 Time (24 hr) 1458

pH 7.15 Cond (umho) MS/cm 979 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.4 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 2.06 Turb. (NTU) 47.27

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)  
Kaelyn Sperte

Received by: (Signature)  
[Signature]

Date (mm/dd/yy) 11/20/23  
Time (24 hr) 1613

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-6000  
PWS ID#:  
State: ky

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Sparte  
\*required information\*

Compliance Monitoring? Yes \_\_\_ 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**

**\*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3113381-01 F	<u>11/20/23</u>	<u>1458</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-110	g / c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				
3113381-02 A	<u>11/20/23</u>	<u>1243</u>	Plastic 500mL pH<2 w/HNO3	1	MW-111	g / c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH: <u>✓</u>				
3113381-02 B	<u>11/20/23</u>	<u>1243</u>	Plastic 1L	1	MW-111	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3113381-02 C	<u>11/20/23</u>	<u>1243</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-111	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				
3113381-02 D	<u>11/20/23</u>	<u>1243</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g / c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: MAK

**MW-111**  
Field data collected by: Kaelyn Sparte Date (mm/dd/yy) 11/20/23 Time (24 hr) 1243  
pH 7.94 Cond (umho) 14841 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.6 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 1.81 Turb. (NTU) 15.56  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Kaelyn Sparte Received by: (Signature) MAK Date (mm/dd/yy) 11/20/23 Time (24 hr) 1613

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Project: HMPL Surface Impoundment  
Characterization Wells**

Phone: (270) 844-6000  
PWS ID#:  
State: KY

PO#:  
Quote#

Please Print Legibly

Collected by (Signature): Kaelyn Sperte  
\*required information

Compliance Monitoring? Yes \_\_\_ 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 # 3113381 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3113381-02 E	<u>11/20/23</u>	<u>1243</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-111	g/c	Radium 228 (sub)
Preservation Check: pH: <u>✓</u>							
3113381-02 F	<u>11/20/23</u>	<u>1243</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-111	g/c	Radium Total (sub)
Preservation Check: pH: <u>✓</u>							
3113381-03 A	<u>11/20/23</u>	<u>1137</u>	Plastic 500mL pH<2 w/HNO3	1	MW-112	g/c	Arsenic Tot 6020 Barium Tot 6020 Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Cobalt Tot 6020 Antimony Tot 6020 Lithium Tot 6020 Thallium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
Preservation Check: pH: <u>✓</u>							
3113381-03 B	<u>11/20/23</u>	<u>1137</u>	Plastic 1L	1	MW-112	g/c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
3113381-03 C	<u>11/20/23</u>	<u>1137</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-112	g/c	Radium 226 (sub)
Preservation Check: pH: <u>✓</u>							

Preservation Check Performed by: MAL

MW-112  
Field data collected by: Kaelyn Sperte Date (mm/dd/yy) 11/20/23 Time (24 hr) 1137  
pH 7.50 Cond 466.2 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
Temp (oC) 15.7 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) 2.04 Turb. (NTU) 53-12  
Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Kaelyn Sperte Received by: (Signature) \_\_\_\_\_ Date (mm/dd/yy) 11/20/23 Time (24 hr) 1613

# Chain of Custody

**Scheduled for: 11/20/2023**



**Client: Big Rivers Electric Corporation  
Reid/Green Station**

**Report To:**  
Big Rivers Electric Corporation Reid/Green  
Station  
Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

**Invoice To:**  
Big Rivers Electric Corporation Reid/Green Station

**Project: HMPL Surface Impoundment  
Characterization Wells**

Mark Bertram  
9000 Highway 2096  
Robards, KY 42452

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Kaelyn Anle

Compliance Monitoring? Yes \_\_\_ 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**

\*required information\*

Workorder # 3113381 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
3113381-03 D	<u>11/20/23</u>	<u>1137</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
				Preservation Check: pH: <u>✓</u>			
3113381-03 E	<u>11/20/23</u>	<u>1137</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-112	g / c	Radium 228 (sub)
				Preservation Check: pH: <u>✓</u>			
3113381-03 F	<u>11/20/23</u>	<u>1137</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-112	g / c	Radium Total (sub)
				Preservation Check: pH: <u>✓</u>			

Thermometer Serial Number  
✓ 181390287  
181460057  
Temp 15.6°C

Preservation Check Performed by: MAK

Field data collected by: \_\_\_\_\_ Date (mm/dd/yy) \_\_\_\_\_ Time (24 hr) \_\_\_\_\_

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) Kaelyn Anle Received by: (Signature) [Signature] Date (mm/dd/yy) 11/20/23 Time (24 hr) 1613



December 08, 2023

Rob Whittington  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

RE: Project: 3113381-Revised Report  
Pace Project No.: 30642203

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on November 28, 2023. 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

(Greensburg, PA) - Revision 1 - This report replaces the December 6, 2023 report. This project was revised on December 8, 2023 to include QC sheets.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Samantha Bayura  
samantha.bayura@pacelabs.com  
(724)850-5622  
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 3113381-Revised Report  
 Pace Project No.: 30642203

### Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601  
 ANAB DOD-ELAP Rad Accreditation #: L2417  
 ANABISO/IEC 17025:2017 Rad Cert#: L24170  
 Alabama Certification #: 41590  
 Arizona Certification #: AZ0734  
 Arkansas Certification  
 California Certification #: 2950  
 Colorado Certification #: PA01547  
 Connecticut Certification #: PH-0694  
 EPA Region 4 DW Rad  
 Florida/TNI Certification #: E87683  
 Georgia Certification #: C040  
 Guam Certification  
 Hawaii Certification  
 Idaho Certification  
 Illinois Certification  
 Indiana Certification  
 Iowa Certification #: 391  
 Kansas Certification #: E-10358  
 Kentucky Certification #: KY90133  
 KY WW Permit #: KY0098221  
 KY WW Permit #: KY0000221  
 Louisiana DHH/TNI Certification #: LA010  
 Louisiana DEQ/TNI Certification #: 04086  
 Maine Certification #: 2023021  
 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 #: PA014572023-03  
 New Hampshire/TNI Certification #: 297622  
 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 #: PA200002-015  
 Pennsylvania/TNI Certification #: 65-00282  
 Puerto Rico Certification #: PA01457  
 Rhode Island Certification #: 65-00282  
 South Dakota Certification  
 Tennessee Certification #: TN02867  
 Texas/TNI Certification #: T104704188-22-18  
 Utah/TNI Certification #: PA014572223-14  
 USDA Soil Permit #: 525-23-67-77263  
 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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 3113381-Revised Report  
Pace Project No.: 30642203

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30642203001	3113381-01	Water	11/20/23 14:58	11/28/23 09:40
30642203002	3113381-02	Water	11/20/23 12:43	11/28/23 09:40
30642203003	3113381-03	Water	11/20/23 11:37	11/28/23 09:40

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 3113381-Revised Report  
 Pace Project No.: 30642203

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30642203001	3113381-01	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30642203002	3113381-02	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA
30642203003	3113381-03	EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	LAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 3113381-Revised Report  
 Pace Project No.: 30642203

**Sample: 3113381-01** Lab ID: **30642203001** Collected: 11/20/23 14:58 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.148 ± 0.459 (0.889)</b> C:NA T:84%	pCi/L	12/06/23 14:51	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.663 ± 0.514 (1.03)</b> C:82% T:76%	pCi/L	12/05/23 15:26	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.811 ± 0.973 (1.92)</b>	pCi/L	12/06/23 16:29	7440-14-4	

**Sample: 3113381-02** Lab ID: **30642203002** Collected: 11/20/23 12:43 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.784 ± 0.789 (1.24)</b> C:NA T:85%	pCi/L	12/06/23 14:51	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.924 ± 0.517 (0.953)</b> C:78% T:78%	pCi/L	12/05/23 15:26	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>1.71 ± 1.31 (2.19)</b>	pCi/L	12/06/23 16:29	7440-14-4	

**Sample: 3113381-03** Lab ID: **30642203003** Collected: 11/20/23 11:37 Received: 11/28/23 09:40 Matrix: Water  
 PWS: Site ID: Sample Type:

Comments: • Samplers name and signature not listed on COC.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	<b>0.341 ± 0.519 (0.894)</b> C:NA T:93%	pCi/L	12/06/23 14:51	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	<b>0.224 ± 0.600 (1.34)</b> C:80% T:57%	pCi/L	12/05/23 15:26	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	<b>0.565 ± 1.12 (2.23)</b>	pCi/L	12/06/23 16:29	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 3113381-Revised Report  
 Pace Project No.: 30642203

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QC Batch: 632697	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30642203001, 30642203002, 30642203003

---

METHOD BLANK: 3084324 Matrix: Water  
 Associated Lab Samples: 30642203001, 30642203002, 30642203003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0813 ± 0.311 (0.747) C:82% T:82%	pCi/L	12/05/23 15:29	

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: 3113381-Revised Report  
 Pace Project No.: 30642203

---

QC Batch: 632696	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
	Laboratory: Pace Analytical Services - Greensburg

Associated Lab Samples: 30642203001, 30642203002, 30642203003

---

METHOD BLANK: 3084322 Matrix: Water  
 Associated Lab Samples: 30642203001, 30642203002, 30642203003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.396 ± 0.321 (0.179) C:NA T:89%	pCi/L	12/06/23 14:20	

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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## QUALIFIERS

Project: 3113381-Revised Report  
Pace Project No.: 30642203

### 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.

## REPORT OF LABORATORY ANALYSIS

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WO#: 30642203

SUBCONTRACT ORDER  
Pace Analytical Services, LLC Kentucky  
3113381



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:

Received by Pace Greensburg  
Therm ID      Corr Factor +/-       
Receipt Temp       
Corrected Temp       
Correct Preservation Y/N

Analysis	Expires	Laboratory ID	Comments
Sample ID: 3113381-01	Water	Sampled: 11/20/2023 14:58	Specific Method <span style="float: right;">001</span>
Radium Total (sub)	05/18/2024 14:58	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/18/2024 14:58	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/18/2024 14:58	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Sample ID: 3113381-02	Water	Sampled: 11/20/2023 12:43	Specific Method <span style="float: right;">002</span>
Radium Total (sub)	05/18/2024 12:43	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/18/2024 12:43	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/18/2024 12:43	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Sample ID: 3113381-03	Water	Sampled: 11/20/2023 11:37	Specific Method <span style="float: right;">003</span>
Radium Total (sub)	05/18/2024 11:37	EPA 904.0 Radium Sum C	
Radium 228 (sub)	05/18/2024 11:37	EPA 904.0 Radium Sum C	
Radium 226 (sub)	05/18/2024 11:37	EPA 903.1	

SAMPLE STATE OF ORIGIN Ky RUSH MULTIPLIER 0

Released By [Signature] Date 11/27/23 Received By P. W. [Signature] Date 11/28/23 9:40

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



DC#\_Title: ENV-FRM-GBUR-0088 v06\_Sample Condition Upon Receipt-  
Pittsburgh

Effective Date: 09/20/2023

WO#: 30642203

PM: SMB

Due Date: 12/07/23

Client Name: Pace-KY

CLIENT: PACE\_44\_MVKY

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking Number: 1Z0674570140970556

INITIAL / DATE

Examined By: ps 11/28/23  
Labeled By: ps 11/28/23  
Temped By: \_\_\_\_\_

Custody Seal on Cooler/Box Present:  Yes  No    Seals Intact:  Yes  No  
Thermometer Used: \_\_\_\_\_ Type of Ice: Wet Blue None

Cooler Temperature: \_\_\_\_\_ Observed Temp \_\_\_\_\_ °C    Correction Factor: \_\_\_\_\_ °C    Final Temp: \_\_\_\_\_ °C  
Temp should be above freezing to 6°C

Comments:	Yes	No	NA	pH paper Lot# <u>1000831</u>	D.P.D. Residual Chlorine Lot # _____
Chain of Custody Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. <u>COC received via PM 11/28/23</u>	
Chain of Custody Filled Out: -Were client corrections present on COC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.	
Chain of Custody Relinquished	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.	
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.	
Sample Labels match COC: -Includes date/time/ID Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5.	<u>times on caps say 16:45 for all bottles. times on bottles match COC except some</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. <u>that are rubbed off; including</u>	
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7. <u>O1C, O2C, O2E, O3C, O3E</u>	
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.	
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.	
Correct Containers Used: -Pace Containers Used	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.	
Orthophosphate field filtered:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.	
Hex Cr Aqueous samples field filtered:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.	
Organic Samples checked for dechlorination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.	
Filtered volume received for dissolved tests:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.	
All containers checked for preservation: exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16.	
All containers meet method preservation requirements:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed <u>PS</u>	Date/Time of Preservation _____
				Lot# of added Preservative _____	
8260C/D: Headspace in VOA Vials (> 6mm)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.	
624.1: Headspace in VOA Vials (0mm)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	18.	
Trip Blank Present:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Trip blank custody seal present? YES or NO	
Rad Samples Screened <.05 mrem/hr.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed <u>PS</u>	Date: <u>11/28/23</u> Survey Meter SN: <u>25014380</u>
Comments:					
<u>* Received without COC. 11/28/23 9:40.</u>					

Note: For NC compliance samples with discrepancies, a copy of this form must be sent to the DEHNR Certification office. PM Review is documented electronically in LIMS through the SRF Review schedule in the Workorder Edit Screen.

Client \_\_\_\_\_  
 Site 311338

Page 1 of 1

Profile Number 1185  
 Notes \_\_\_\_\_

Sample Line Item	Matrix	Amber Glass								Plastic								Vials								Other							
		AG1H	AG3S	AG3U	AG5U	AG5T	BP1N	BP1U	BP2S	BP2U	BP3C	BP3N	BP3S	BP3U	DG9S	VG9H	VG9T	VG9U	VOAK	WG1U	WG1U	ZPLC	GCUB	GJN	12GN	GN	EG1U						
001	WT						3																										
002	↓						3																										
003	↓						3																										

Container Codes

Glass	
GJN	1 Gallon Jug with HNO3
AG5U	100mL amber glass unpreserved
AG5T	100mL amber glass Na Thiosulfate
GJN	1 Gallon Jug
AG1S	1L amber glass H2SO4
AG1H	1L amber glass HCl
AG1T	1L amber glass NA Thiosulfate
BG1U	1L clear glass unpreserved
B3S	250mL amber glass H2S
B3U	250mL amber glass unpr

**MO# : 30642203**

PM: SMB  
 Due Date: 12/07/23  
 CLIENT: PRCE\_44\_MVKY

Qualtrax ID: 55678

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 Volatile Solid
I	Wipe/Swab
ZPLC	Siploc Bag

WT	Water
SL	Solid
OL	Non-Aq Liquid
WP	Wipe

# Quality Control Sample Performance Assessment

**Analyst Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-226  
Analyst: CLIM  
Date: 11/30/2023  
Batch ID: 76608  
Matrix: DW



Method Blank Assessment	
MB Sample ID	3084322
MB concentration:	0.396
MB Counting Uncertainty:	0.317
MB MDC:	0.179
MB Numerical Performance Indicator:	2.45
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	#N/A

Laboratory Control Sample Assessment	LCS (Y or N)?	
	LCS76608	LCS76608
Count Date:	12/6/2023	12/6/2023
Spike I.D.:	23-013	23-013
Spike Concentration (pCi/mL):	32.279	32.279
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.657	0.655
Target Conc. (pCi/L, g, F):	4.912	4.929
Uncertainty (Calculated):	0.231	0.232
Result (pCi/L, g, F):	5.586	6.310
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.256	1.292
Numerical Performance Indicator:	113.72%	128.02%
Status vs Numerical Indicator:	N/A	N/A
Upper % Recovery Limits:	133%	133%
Lower % Recovery Limits:	73%	73%

Duplicate Sample Assessment	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:	LCS76608
Duplicate Sample I.D.:	LCS76608
Sample Result Counting Uncertainty (pCi/L, g, F):	5.586
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.256
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	6.310
Are sample and/or duplicate results below RL?	1.292
Duplicate Numerical Performance Indicator:	NO
Duplicate Status vs Numerical Indicator:	-0.787
Duplicate Status vs Numerical Indicator:	11.83%
Duplicate Status vs RPD:	N/A
% RPD Limit:	32%

# Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments: #N/A

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.:		
Sample MS I.D.:		
Sample MSD I.D.:		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MSD Aliquot (L, g, F):		
MS Target Conc. (pCi/L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment
Sample I.D.:
Sample MS I.D.:
Sample MSD I.D.:
Sample Matrix Spike Result:
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):
Sample Matrix Spike Duplicate Result:
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):
Duplicate Numerical Performance Indicator:
(Based on the Percent Recoveries) MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:
MS/MSD Duplicate Status vs RPD:
% RPD Limit:

CUM  
12/6/23

12/6/23



# Quality Control Sample Performance Assessment



**Analyst Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-228  
Analyst: VAL  
Date: 12/1/2023  
Worklist: 76609  
Matrix: WT

Method Blank Assessment	
MB Sample ID	3084324
MB concentration:	-0.081
MB 2 Sigma CSU:	0.311
MB MDC:	0.747
MB Numerical Performance Indicator:	-0.51
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCS (Y or N)?	
	LCS76609	LCS76609
Count Date:	12/5/2023	12/5/2023
Spike I.D.:	23-043	23-043
Decay Corrected Spike Concentration (pCi/mL):	38.762	38.762
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.816	0.816
Target Conc. (pCi/L, g, F):	4.750	4.751
Uncertainty (Calculated):	0.233	0.233
Result (pCi/L, g, F):	4.056	3.319
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.947	0.831
Numerical Performance Indicator:	-1.39	-3.25
Percent Recovery:	85.40%	69.85%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment	LCS (Y or N)?	
	LCS76609	LCS76609
Sample I.D.:	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.	
Duplicate Sample I.D.:		
Sample Result (pCi/L, g, F):	4.056	
Sample Duplicate Result (pCi/L, g, F):	0.947	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	3.319	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	0.831	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	1.147	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	20.04%	
Duplicate Status vs Numerical Indicator:	Pass	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	36%	

## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*Handwritten notes:*  
 JD  
 12-6-23  
 ZC  
 12-6-23

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date: Sample I.D. Sample MS I.D. Sample MSD I.D. Spike I.D.: MS/MSD Decay Corrected Spike Concentration (pCi/mL): Spike Volume Used in MS (mL): Spike Volume Used in MSD (mL): MS Aliquot (L, g, F): MS Target Conc. (pCi/L, g, F): MSD Aliquot (L, g, F): MSD Target Conc. (pCi/L, g, F): MS Spike Uncertainty (calculated): MSD Spike Uncertainty (calculated):		
Sample Result 2 Sigma CSU (pCi/L, g, F): Sample Matrix Spike Result: Matrix Spike Result 2 Sigma CSU (pCi/L, g, F): Sample Matrix Spike Duplicate Result: Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F): MS Numerical Performance Indicator: MS Percent Recovery: MSD Percent Recovery: MS Status vs Numerical Indicator: MSD Status vs Numerical Indicator: MS Status vs Recovery: MSD Status vs Recovery: MS/MSD Upper % Recovery Limits: MS/MSD Lower % Recovery Limits:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment
Sample I.D. Sample MS I.D. Sample MSD I.D. Matrix Spike Result 2 Sigma CSU (pCi/L, g, F): Sample Matrix Spike Duplicate Result: Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F): Duplicate Numerical Performance Indicator: (Based on the Percent Recoveries) MS/MSD Duplicate RPD: MS/MSD Duplicate Status vs Numerical Indicator: MS/MSD Duplicate Status vs RPD: % RPD Limit: