2020 Annual Groundwater Monitoring and Corrective Action Report

for the

Federal Coal Combustion Residuals Rule

Sebree Station
Webster County, Kentucky

Prepared for:

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Distribution List

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Executive Summary

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2020 at the Big Rivers Electric Corporation (BREC) Sebree Generating Station as required by 40 CFR 257.90(e) of the United States Environmental Protection Agency (USEPA) coal combustion residuals (CCR) Rule. The following three units at the station are subject to the CCR Rule:

- Green Station Landfill (Webster County);
- Green Station Surface Impoundment (Webster County); and
- Reid/Henderson Municipal Power and Light (HMP&L) Surface Impoundment (Henderson County)

A site figure presenting the location CCR units is presented as **Figure 1**. The program monitoring networks for each CCR unit including supporting monitoring wells are presented as **Figures 2** through **4**. No monitoring wells were installed, modified or abandoned during the reporting period.

Results of baseline groundwater monitoring performed in 2016 and 2017 indicated that the Green Landfill and Reid/HMP&L Surface Impoundment would require initiation of Assessment Monitoring under the CCR Rule, as most or all of the Appendix III constituents have statistically significant increases (SSIs) over background as noted below.

- Appendix III parameters calcium (Ca), chloride (Cl), sulfate (SO_4), and total dissolved solids (TDS) at the Green Landfill
- All Appendix III parameters at the Reid/HMP&L Surface Impoundment

On February 5, 2018, BREC posted a formal notification that the Green Landfill and Reid/HMP&L Surface Impoundment would transition from Baseline Detection to Assessment monitoring programs. At both the start and end of the 2020 annual reporting period, the Green Landfill and Reid/HMP&L Surface Impoundment were operating under the assessment monitoring program in 40 CFR 257.95.

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 2020 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.

Groundwater analytical data collected during Assessment monitoring at the Green Landfill and Reid/HMP&L Surface Impoundment indicated that Appendix IV constituents were detected in downgradient monitoring wells at SSIs over background as detailed below.

Appendix IV Constituent at an SSI	Green Landfill	Reid HMP&L Surface Impoundment
Arsenic	June 2018, July 2018, April 2019, October 2019, April 2020, September 2020	none
Barium	June 2018, July 2018, April 2019, October 2019, April 2020, September 2020	April 2018, June 2018, May 2019, October 2019, April 2020, September 2020
Cobalt	September 2020	none
Chromium	none	April 2018, June 2018,
Fluoride	none	April 2018, June 2018, May 2019, October 2019, April 2020, September 2020

Lithium	June 2018, July 2018, April 2019, October 2019, April 2020, September 2020	April 2018, June 2018, May 2019, October 2019, April 2020, September 2020
Mercury	June 2018, July 2018, April 2019, October 2019, April 2020, September 2020	April 2020, September 2020
Radium 226+228	none	April 2018, June 2018, May 2019, October 2019, April 2020, September 2020
Selenium	April 2020	none

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 the current annual reporting period are as follows:

Appendix IV Constituent at an SSL	Green Landfill	Reid HMP&L Surface Impoundment
Lithium	MW-3A, MW-4, MW-5, and MW-6	MW-10

On December 6, 2018, BREC posted formal notification that lithium had been detected at SSLs above the established GWPS for both the Green Landfill and the Reid HMP&L Surface Impoundment. In June 2019 BREC finalized an Assessment of Corrective Measures (ACM) for both the Green Landfill and Reid/HMP&L Surface Impoundment to identify applicable remedial technologies to address impacts in groundwater pursuant to Title 40 CFR Section 257.96. Reports summarizing the results of the Green Landfill ACM and Reid/HMP&L Surface Impoundment ACM were completed and placed in the BREC operating record on June 13, 2019. The ACM reports were posted to BREC's publicly-accessible CCR reporting website on July 11, 2019. Semi-annual progress on the Selection of Remedy process for both units was reported in December 2019 and June 2020. Semi-annual progress for the Reid/HMP&L Surface Impoundment was also reported in December 2020.

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 for Green Landfill, thereby selecting the remedy for groundwater and non-groundwater impacts at the unit in accordance with 40 CFR Part 257.97. Remedial planning and implementation at Green Landfill are ongoing, including the start of constructing on additional source control measures around the perimeter of the Green Landfill in November 2020.

A public meeting has not been held to date to discuss the results of the ACM for the Reid HMP&L Surface Impoundment. BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation for this unit and anticipates providing additional data in future semi-annual remedy selection progress reports.

Other activities and conditions for the 2020 annual reporting period include:

- Semi-annual Assessment groundwater monitoring events were performed at Green Landfill and Reid/HMP&L Surface Impoundment in April and September 2020;
- Semi-annual Detection groundwater monitoring events were performed at Green Surface Impoundment in April and September 2020;
- No monitoring well installation, repair, or decommissioning was performed; and
- No program transitions (Detection to Assessment or vice versa) were triggered.

Anticipated activities for the next annual reporting period include:

- Completion of two semi-annual Assessment groundwater monitoring events at Green Landfill and Reid/HMP&L Surface Impoundment;
- Completion of two semi-annual Detection groundwater monitoring events at Green Surface Impoundment;
- Remedy Implementation at Green Landfill; and
- Progress towards selection of a remedy for the Reid/HMP&L Surface Impoundment, including holding a public meeting to discuss the results of the ACM.

This 2020 Annual Groundwater Monitoring and Corrective Action Report for the Big Rivers Electrical Corporation 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, Figure 3** and **Figure 4)**;

(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. **No monitoring wells were installed or decommissioned in 2020**;

(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 a statistically significant increase (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 assessment of corrective measures [ACMs]) **(no other information was developed or reported in 2020 as noted in Section 2)**.

1. Introduction

At the request of Big Rivers Electric Corporation (BREC), AECOM Technical Services, Inc. (AECOM) prepared this 2020 Annual Groundwater Monitoring and Corrective Action Report for the BREC Sebree Generating Station (Sebree Station), located in Henderson and Webster Counties, Kentucky. This report was prepared in accordance with Part 257.90, Sub-Part (e) of the United States Environmental Protection Agency (USEPA) Coal Combustion Residuals (CCR) Rule. The CCR Rule was established to regulate the disposal of CCR produced by electricity generating facilities (USEPA, 2015).

This report summarizes activities conducted in 2020 related to the CCR Rule groundwater monitoring program at the following CCR units:

- Green Station Landfill (Webster County);
- Green Station Surface Impoundment (Webster County); and
- Reid/Henderson Municipal Power and Light (HMP&L) Surface Impoundment (Henderson County)

The following sections present a site background summary, 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.

As stated in the previous 2016-2019 Annual Groundwater Monitoring and Corrective Action Reports, statistical results of the Baseline groundwater data indicate that the Green Landfill and Reid/HMP&L Surface Impoundment would require initiation of Assessment Monitoring under the CCR Rule, as most or all of the Appendix III constituents have statistically significant increases (SSIs) over background as noted below.

- Appendix III parameters calcium, chloride, sulfate, and total dissolved solids (TDS) at the Green Landfill
- All Appendix III parameters at the Reid/HMP&L Surface Impoundment

On February 5, 2018, BREC posted a formal notification that the Green Landfill and Reid/HMP&L Surface Impoundment would enter Assessment Monitoring Programs, fulfilling the requirement of 40 Code of Federal Regulations (CFR) Section 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.

1.1 Site Description

BREC owns and operates Sebree Station, which is a coal-fired 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 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.

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

1.1.1 Green Landfill

The Green Landfill is located directly south of Sebree Station, situated south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that

receives 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. The current Green Landfill footprint is approximately 170 acres.

As stated in the published CCR monitoring well network certification for this unit (Associated Engineering Inc., June 2016), 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 (KGS) 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 Sebree Station and situated north of the Green Landfill. The Green Surface Impoundment has been in place for more than 40 years and is used for the placement of CCR material. 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 (KPDES) permit, to the Green River.

As stated in the CCR monitoring well network certification for this unit (Associated Engineering Inc., June 2016), 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 to Green River.

1.1.3 Reid/HMP&L Surface Impoundment

The Reid/HMP&L Surface Impoundment is located directly northwest and adjacent of the Sebree Station. The Reid/HMP&L Surface Impoundment has been in place for more than 40 years and was formerly used for the placement of CCR material. The immediate watershed that drains to the CCR unit, and in which the CCR unit is located, is unnamed and 25.45 acres in size. The unnamed watershed discharges from the CCR impoundment outflow structure and is routed, under a KPDES permit, to the Green River.

As stated in the CCR monitoring well network certification for this unit (Associated Engineering Inc., June 2016), the Reid/HMP&L 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.

1.2 Green Landfill Program Monitoring Well Systems

1.2.1 Green Landfill Operating Permit 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 downgradient monitoring wells must be located at the waste boundary of the (active) CCR unit, or as close as practical.

Under the requirements stated in the operating permit, 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 site. MW-1 is located northwest of the landfill and is considered upgradient. 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 well installation are summarized on **Table 1**. The locations of the groundwater monitoring wells are shown on **Figure 2**. Each well has a dedicated bladder pump and tubing system installed for sampling purposes.

As stated in the CCR monitoring well network certification, the stratigraphic interval considered as the most prominent water transmitting zone within and adjacent to the Green Landfill is material identified as the Upper Sandstone Member (Sebree sandstone) of the Carbondale Formation. The United States Geological Survey (USGS) Geologic Map of the Robards Quadrangle 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 member sandstone intervals, is considered to be the uppermost aquifer underlying the Green Landfill.

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, July 1997). **No changes were made to the Program Monitoring Well System in 2020**.

1.2.2 Green Landfill Characterization Monitoring Wells

To address the requirements of 40 CFR Section 257.95(g)(1), one (1) Characterization monitoring well (MW-104) was installed in February 2019 to characterize groundwater at the location indicated on **Figure 2**. As-built specifics of each well installation are summarized on **Table 1**.

The Characterization monitoring well, located at a downgradient position east of the Unit, was 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 Program Monitoring Well Systems

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 upgradient and three (3) downgradient monitoring wells. A upgradient monitoring well (MW-11) was installed adjacent to, and northwest of the impoundment. 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 Green Surface Impoundment. As-built specifics of each well installation are summarized on **Table 2**. The locations of the groundwater monitoring wells are shown on **Figure 3**. Each well has a dedicated bladder pump system and tubing installed for 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 USGS Geologic Map of the Robards Quadrangle 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 member 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 Sebree Station. **No changes were made to the Program Monitoring Well System in 2020**.

Due to the lack of SSLs for the unit, no Characterization monitoring wells are required for the Green Surface Impoundment.

1.4 Reid/HMP&L Surface Impoundment Program Monitoring Well Systems

1.4.1 Reid/HMP&L Surface Impoundment Operating Permit Monitoring Wells

As stated in the CCR monitoring well network certification, prior to implementation of the CCR Rule, five temporary piezometers (P-13/P-13A, P-14 and P-15/P-15A) were installed adjacent to and (respectively) northwest, southeast and southwest of the Reid/HMP&L Surface Impoundment to determine general direction of groundwater movement. Measured static water levels, from the highest to lowest elevation were observed in P-13/13A (highest), P-14 and P-15/P-15A (lowest) resulting in a calculated hydraulic gradient or apparent direction of groundwater movement generally from east-northeast to west-southwest. This groundwater gradient characterization allowed precise placement of monitoring wells for the CCR unit, thereby justifying the placement of the minimum of one upgradient and three (3) downgradient monitoring wells. The upgradient monitoring well (MW-7) was installed adjacent to, and east-northeast of the impoundment. The downgradient monitoring wells (MW-8, MW-9 and MW-10) were installed adjacent to, and respectively; west, southwest and south-southwest of the impoundment. As-built specifics of each well installation are summarized on **Table 3.** The locations of the groundwater monitoring wells are shown on **Figure 4**. Each well has a dedicated bladder pump system and tubing installed for sampling purposes.

The stratigraphic interval considered as the most prominent water transmitting zone within and adjacent to the Sebree Generating Station is material identified as the interbedded sandstone and shale of the Shelburn Formation (also referred to as the Lisman Formation). The USGS Geologic Map of the Robards Quadrangle describes this sequence as “Sandstone, shale, limestone, coal and underclay”. For purposes of compliance with the USEPA Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule groundwater monitoring requirements; this sequence, and in particular the member sandstone intervals, is considered to be the uppermost aquifer underlying the Reid/HMP&L 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 Sebree Station. **No changes were made to the Program Monitoring Well System in 2020**.

1.4.2 Reid/HMP&L Surface Impoundment Characterization Monitoring Wells

To address the requirements of 40 CFR Section 257.95(g)(1), one Characterization monitoring well (MW-110) was installed in February 2019 to characterize groundwater at locations indicated on **Figure 4**. As-built specifics of this well installation are summarized on **Table 3**.

The Characterization monitoring well, located at a downgradient position southwest of the Unit, was 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.

2. 2020 Activities Summary

The following subsections describe the activities that were performed in 2020 for the three CCR units noted above related to each of their corresponding CCR Groundwater Monitoring Networks.

2.1 Groundwater Sampling

During 2020, the following monitoring events were performed at Sebree Station:

- Green Landfill: Two Assessment groundwater monitoring events and two Characterization groundwater monitoring events;
- Green Surface Impoundment: Two Detection groundwater monitoring events; and
- Reid/HMP&L: Two Assessment groundwater monitoring events and two Characterization groundwater monitoring events.

The following tables summarize the dates of each sampling event and the wells included in the events for each CCR unit.

Green Landfill			
Event Type	Sampling Event	Dates	Wells Sampled
Assessment	First-Half 2020	April 6-7, 2020	Background (Upgradient) MW-1 Downgradient MW-2, MW-3A, MW-4. MW-5, MW-6
Characterization	1	April 17, 2020	Characterization (Downgradient) MW-104
Assessment	Second-Half 2020	September 22, 2020	Background (Upgradient) MW-1 Downgradient MW-2, MW-3A, MW-4. MW-5, MW-6
Characterization	2	October 1, 2020	Characterization (Downgradient) MW-104

Green Surface Impoundment			
Event Type	Sampling Event	Dates	Wells Sampled
Detection	First-Half 2020	April 8, 2020	Background (Upgradient) MW-11 Downgradient MW-12, MW-13, MW-14
Detection	Second-Half 2020	September 25, 2020	Background (Upgradient) MW-11 Downgradient MW-12, MW-13, MW-14

Reid/HMP&L Surface Impoundment			
Event Type	Sampling Event	Dates	Wells Sampled
Assessment	First-Half 2020	April 16, 2020	Background (Upgradient) MW-7 Downgradient MW-8, MW-9, MW-10
Characterization	1	April 17, 2020	Characterization (Downgradient) MW-110
Assessment	Second-Half 2020	September 24, 2020	Background (Upgradient) MW-7 Downgradient MW-8, MW-9, MW-10
Characterization	2	October 1, 2020	Characterization (Downgradient) MW-110

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

Groundwater sampling activities were performed by BREC personnel with all collected samples submitted to Pace Analytical Laboratory (Pace) in Madisonville, Kentucky, for analyses. Groundwater samples collected at the Green Landfill and Reid/HMP&L Surface Impoundment during Assessment and Characterization Monitoring events were analyzed for Appendix III and Appendix IV parameters, in accordance with 40 CFR Section 257.95(d)(1). Groundwater samples collected at the Green Surface Impoundment for the Detection Monitoring Event were analyzed for Appendix III parameters only, in accordance with 40 CFR Section 257.94(a).

No filtration of samples was conducted in either the field or laboratory procedures. Laboratory analyses were performed in accordance with approved USEPA methods.

2.2 Public Meeting

BREC held a public meeting on July 16, 2020 in Henderson, Kentucky to discuss the results of the Groundwater ACM for Green Landfill in accordance with 40 CFR Part 257.96(e). No public input influencing the remedy for the unit was received during the meeting.

A public meeting has not been held to date to discuss the results of the ACM for the Reid HMP&L Surface Impoundment. BREC is working to establish a comprehensive list of data collection needs to proceed forward with remedy evaluation for this unit and anticipates providing additional data in future semi-annual remedy selection progress reports.

2.3 Remedy Selection

On November 18, 2020 BREC finalized a Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report (GNGCARSR) for Green Landfill, thereby selecting the remedy for groundwater and non-groundwater impacts at the unit in accordance with 40 CFR Part 257.97. In alignment with the scoring completed as part of the corrective measure evaluation within the GNGCARSR, BREC has selected Alternative #5 (closure in place, other source control, institutional controls, and groundwater monitoring) as the remedy to address groundwater and non-groundwater impacts at Green Landfill.

Remedy Selection is being evaluated for the Reid HMP&L Surface Impoundment.

3. Data Evaluation

3.1 Groundwater Flows

Water level data collected from each unit during the 2020 monitoring events are summarized on **Table 4** (Green Landfill), **Table 5** (Green Surface Impoundment), and **Table 6** (Reid/HMP&L 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 units and support the following analysis.

GREEN LANDFILL

Overall groundwater flow beneath the footprint of the Green Landfill is to the east and southeast towards the Green River and Groves Creek (see **Figure 5**).

GREEN SURFACE IMPOUNDMENT

Overall groundwater flow beneath the footprint of the Green Surface Impoundment is to the east-southeast towards the Green River which is located east of the impoundment (see **Figure 6**).

REID/HMP&L SURFACE IMPOUNDMENT

Overall groundwater flow beneath the footprint of the Reid/HMP&L Surface Impoundment is to the southwest towards an unnamed tributary to Groves Creek located west-southwest of the impoundment (see **Figure 7**).

3.2 Sampling Results

During 2020, the following monitoring events were performed at Sebree Station:

- Green Landfill: Two (2) Assessment groundwater monitoring events and two (2) Characterization groundwater monitoring events;
- Green Surface Impoundment: Two (2) Detection groundwater monitoring events; and
- Reid/HMP&L: Two (2) Assessment groundwater monitoring events and two (2) Characterization groundwater monitoring events.

Results from the Assessment and Characterization monitoring events are summarized on the tables included in **Appendix B, Appendix C, and Appendix D** for each unit. Complete analytical laboratory reports are included in **Appendix E, Appendix F, and Appendix G** for each unit.

3.3 Statistical Evaluation

As part of previous Assessment monitoring performed at the Green Landfill and Reid/HMP&L Surface Impoundment, background and downgradient wells for each unit were sampled for Appendix IV constituents in 2018 through 2020. In accordance with 40 CFR Section 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 (see **Appendix B**); and
- Reid/HMP&L: lithium in monitoring well MW-10 (see **Appendix D**).

The Green Surface Impoundment was not subject to Assessment Monitoring and therefore no SSL determination was required.

In accordance with 40 CFR Section 257.93(f), 40 CFR Section 257.93(h), and 40 CFR Section 257.95(d)(2), AECOM conducted a statistical evaluation of the 2020 Assessment groundwater data as part of developing this summary report to determine any SSIs over baseline concentrations for the Appendix III and Appendix IV parameters and any SSLs over established GWPS for detected Appendix IV parameters. Summaries of the 2020 statistical evaluation conducted on the Appendix III and assessment Appendix IV parameters are provided as **Appendix H**, **Appendix I**, and **Appendix J** for each unit. The results of each unit-specific evaluation are discussed below.

Statistical methods were chosen in accordance with 40 CFR Section 257.93(f), while the rationale behind why each method was selected is outlined in the Statistical Methods Certification Document prepared for each unit dated June 28, 2016.

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 background monitoring well. For the Green landfill, monitoring well MW-1 is designated as the background well because it is located upgradient, whereas monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 are designated as compliance wells because they are located downgradient.

The statistical analysis results indicate that Appendix III constituents have SSIs over background as follows (see **Appendix H**; **Table H2 and H3**):

- MW-2: calcium, chloride, sulfate, and TDS;
- MW-3A: calcium, chloride, pH lower prediction limit (LPL), sulfate, and TDS;
- MW-4: calcium, chloride, pH LPL, sulfate, and TDS;
- MW-5: boron, calcium, chloride, pH LPL, sulfate, and TDS; and
- MW-6: calcium, chloride, pH LPL, sulfate, and TDS.

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

The statistical analysis results also indicate that the following Appendix IV constituents have SSIs over background (see **Appendix H**; **Table H2 and H3**):

- MW-2: arsenic and barium;
- MW-3A: cobalt and lithium;
- MW-4: lithium, mercury, and selenium;
- MW-5: lithium; and
- MW-6: lithium.

These constituents were further evaluated to determine whether they are present at SSLs over the GWPS by calculating the lower confidence limit (LCL) at 95% confidence for each well and constituent using all of the Baseline, Detection, and Assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS. **Attachment H**, **Tables H4 and H5** provide a summary of the LCLs and GWPS for arsenic, barium, cobalt, lithium, mercury, and selenium for the monitoring wells identified above for the spring and fall semi-annual events, respectively. The results indicate that **lithium at monitoring wells MW-3A, MW-4, MW-5 and MW-6 (grey highlights) is present at SSLs above the GWPS**. The LCLs for the remaining wells and constituents are equal to or less than the GWPS and thus are not considered SSLs. A summary of the statistical evaluation conducted on the Appendix III and Assessment Appendix IV parameters for the Green Landfill is provided as **Appendix H**.

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

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, whereas monitoring wells MW-12, MW-13, and MW-14 are designated as compliance wells because they are located downgradient.

The statistical analysis results indicate that none of the Appendix III constituents (boron, calcium, chloride, fluoride, pH, sulfate or total dissolved solids [TDS]) have verified SSIs over their background UPL (see **Table I2**). In addition, pH does not have a verified SSI below its LPL. Based on these results, Assessment Monitoring is not currently required at the Green Surface Impoundment.

A summary of the statistical evaluations conducted on the Detection Appendix III parameters for the Green Surface Impoundment is provided as **Appendix I**.

3.3.3 Reid/HMP&L Surface Impoundment Statistical Evaluation

The Reid/HMP&L Surface Impoundment 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 background monitoring well. For the Reid/HMP&L Surface Impoundment, monitoring well MW-7 is designated as the background well because it is located upgradient of the impoundment, whereas monitoring wells MW-8, MW-9, and MW-10 are designated as compliance wells because they are located downgradient of the impoundment.

The statistical analysis results indicate that Appendix III constituents have SSIs over background (see **Appendix J**; **Table J2 and J3**):

- MW-8: boron, calcium, chloride, fluoride, sulfate, and TDS;
- MW-9: calcium, chloride, and TDS; and
- MW-10: boron, chloride, fluoride, pH (UPL), sulfate, and TDS.

Based on these results, Assessment Monitoring is required to continue at the Unit on a semi-annual basis.

The statistical analysis results also indicate that the following Appendix IV constituents have SSIs over background (see **Appendix J**; **Table J2 and J3**):

- MW-8: fluoride, and lithium;
- MW-9: barium, lithium, and radium-226+228; and
- MW-10: barium, fluoride, mercury, and lithium.

These constituents were further evaluated to determine whether they are present at SSLs over the GWPS by calculating the LCL at 95% confidence for each well and constituent using all of the Baseline, Detection, and Assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its LCL must be greater than the GWPS. **Attachment J**, **Table J4 and J5** provides a summary of the LCLs and GWPS for barium, fluoride, lithium, mercury, and radium for the monitoring wells identified above for the spring and fall semi-annual events, respectively. The results indicate that **lithium at monitoring wells MW-10 (gray highlight) is the only Appendix IV constituent present at SSLs above the GWPS**. The LCLs for the remaining wells and constituents are equal to or less than the GWPS and thus are not considered SSLs. A summary of the statistical evaluation conducted on the

Appendix III and Assessment Appendix IV parameters for the Reid/HMP&L surface Impoundment is provided as **Appendix J**.

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

3.4 Conclusions

Based upon the statistical evaluation of Appendix III and Appendix IV parameters collected during Assessment Monitoring at the Green Landfill and Reid/HMP&L Surface Impoundment in 2020, BREC is required to continue Assessment Monitoring in 2021.

Based upon the statistical evaluation of Appendix III parameters collected during the Detection Monitoring period at the Green Surface Impoundment in 2020, BREC is required to continue semi-annual Detection Monitoring in 2021.

4. 2021 Planned Activities

The following subsection summarizes the upcoming actions planned for 2021.

4.1 Groundwater Monitoring

Continued Semi-Annual Assessment monitoring of all operating permit monitoring wells for the Green Landfill and the Reid/HMP&L Surface Impoundment is planned for 2021.

Other planned activities for 2021 include two semi-annual Detection Monitoring sampling events and subsequent statistical evaluations for the Green Surface Impoundment.

4.2 Remedy Implementation at Green Landfill

In alignment with the scoring completed as part of the corrective measure evaluation within the GNGCARSR, BREC has selected Alternative #5 (closure in place, other source control, institutional controls, and groundwater monitoring) as the remedy to address groundwater and non-groundwater impacts at Green Landfill.

Implementation of the other source control element of Alternative #5 was initiated in 2019 with installation of the Northwest Collection Trench system and continued into 2020 with finalization of the East Collection Trench system. Installation of additional perimeter control systems was initiated in 2020 and is expected to be completed in 2021. Implementation of the South Sedimentation Basin cleanout and re-configuration is also planned for 2021.

4.3 Remedy Selection at Reid/HMP&L Surface Impoundment

Although a formal schedule has not been finalized, BREC anticipates holding a public meeting to discuss the results of the ACM for the Reid HMP&L Surface Impoundment in 2021. Within 90 days of the public meeting, a remedy will be selected for the unit.

5. References

AECOM, 2018. Annual Groundwater Monitoring and Corrective Action Report, 2016-2017; Green Station CCR Landfill, Webster County, Kentucky.

AECOM, June 2019. Assessment of Corrective Measures Under the CCR Rule, Green Station CCR Landfill, Webster County, Kentucky.

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AECOM, 2020. 2019 Annual Groundwater Monitoring and Corrective Action Report, Sebree Generating Station, Henderson and Webster Counties Kentucky.

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

FMSM Engineers, July 1997. Monitoring Well Completion Report, Special Waste Landfill Facility, R.D. Green Station, Webster County, Kentucky.

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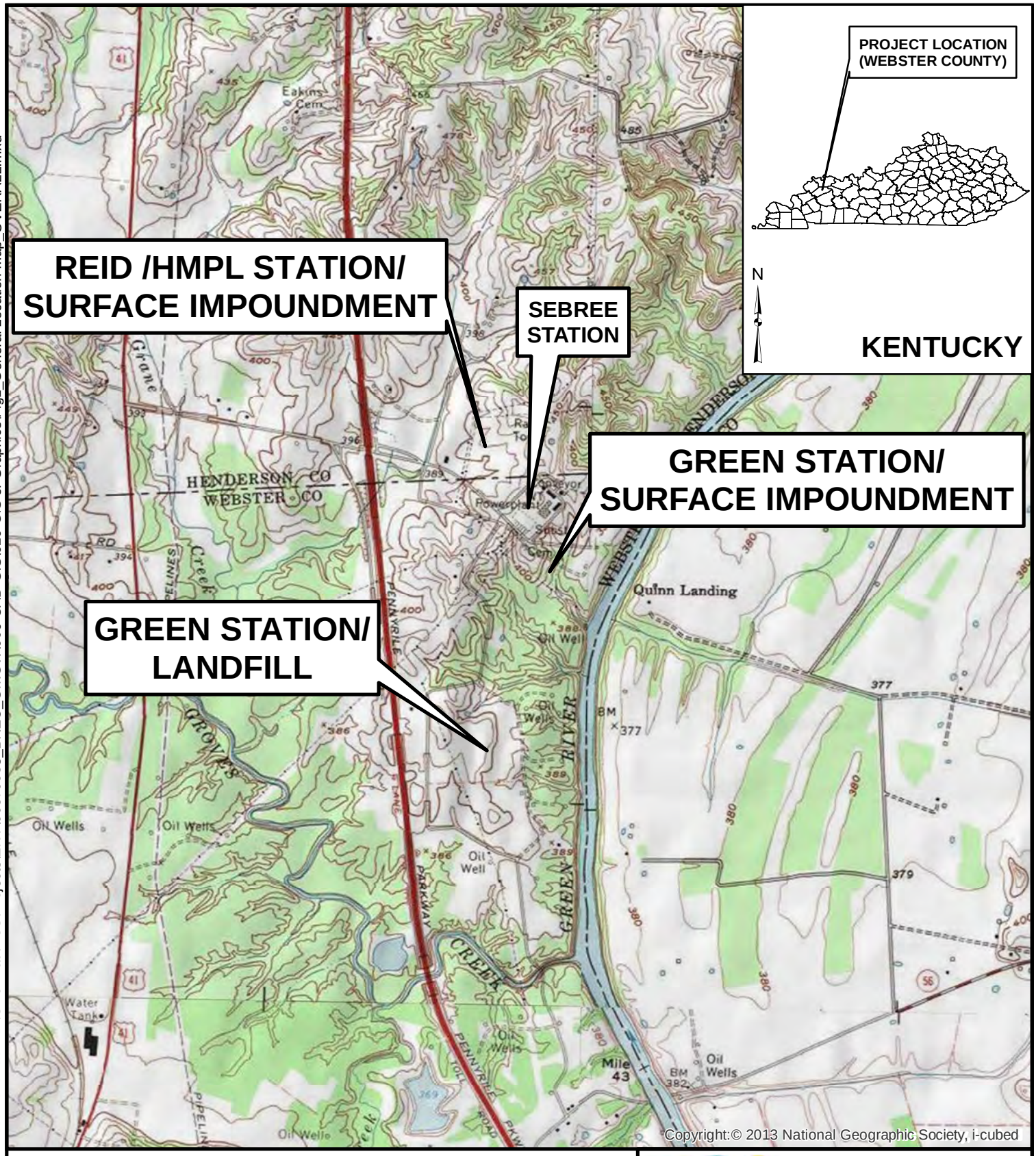
Figures



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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ROBARDS QUADRANGLE
DELAWARE QUADRANGLE
(FROM ARCGIS ONLINE Copyright:© 2011 National Geographic Society, i-cubed)

0 2,000 4,000 Feet

N

Big Rivers ELECTRIC CORPORATION

Sebree Station
Webster County, Kentucky

FIGURE 1
GENERAL LOCATION MAP

DATE: 1/8/2019	SCALE: 1IN = 2,000 FEET
CREATED BY: ALW	
JOB NO. 60579938	

Document Path: G:\Cincinnati\DCS\GIS\ArcMap GeoDB Projects\ENV\60579938 BREC GrnGW\920-GIS or Graphics\Fig2 REC Green.mxd

MW-1
MW-2
MW-3A
MW-104
MW-6
MW-5
MW-4
Green River
Groves Creek
bing
© 2019 Microsoft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus DS

Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Characterization Well

Dennis P. Connair
PG 0197
Registered Professional Geologist

0 400 800
Feet

N

Big Rivers ELECTRIC CORPORATION

Green Landfill
Webster County, Kentucky

FIGURE 2
WELL LOCATION MAP

DATE: 12/9/2019	SCALE: 1IN = 300 FEET
CREATED BY: ALW	
JOB NO. 60602364	

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Legend

- (Impoundment) Unit Boundary
- Property Line
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well

Dennis P. Conner — Registered Professional Geologist — PG 0197 — Commonwealth of Kentucky

0 200 400
Feet

N

Big Rivers Electric Corporation

Green Suface Impoundment
Webster County, Kentucky

FIGURE 3
CCR GROUNDWATER
MONITORING SYSTEM

DATE: 1/11/2019	SCALE: 1IN = 200 FEET
CREATED BY: ALW	
JOB NO. 60579938	

Document Path: G:\Cincinnati\DCS\Projects\ENV\60579939_BREC_RedGW\900-CAD-GIS\920-GIS or Graphics\Fig6_GW_Mon_Reid.mxd

Legend

- Unit Boundary
- Property Line
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Characterization Well

0 300 600

Feet

N

Big Rivers Electric Corporation

Reid/HMPL Surface Impoundment
Webster County, Kentucky

FIGURE 4
GROUNDWATER
MONITORING SYSTEM

DATE: 1/8/2019	SCALE: 1IN = 200 FEET
CREATED BY: ALW	
JOB NO. 60579939	

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Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Water Table Contour (Dashed where Inferred from Available Monitoring Data)
- Groundwater Flow Direction
- 373.43 Groundwater Elevation (Feet, MSL) Measured September 22, 2020
- * MW-12 gauged 9-25-20

0 400 800
Feet

N

Big Rivers Electric Corporation

Green Station Landfill
Webster County, Kentucky

FIGURE 5
POTENTIOMETRIC SURFACE MAP
September 22, 2020

DATE: 11/6/2020	SCALE: 1IN = 400 FEET
CREATED BY: TMJ	
JOB NO. 60579938	

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Legend

- (Impoundment) Unit Boundary
- Property Line
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Water Table Contour (Dashed Where Inferred)
- Groundwater Flow Direction

391.42 Groundwater Elevation (Feet, MSL)
Measured September 25, 2020

Green River Elevation based on USGS Lock 2 in Calhoun, KY Data Gage at 13:00 on 9/25/20

0 200 400
Feet

N

Big Rivers Electric Corporation

Green Suface Impoundment
Webster County, Kentucky

FIGURE 6
GROUNDWATER SURFACE MAP
SEPTEMBER 2020

DATE: 12/29/2020	SCALE: 1IN = 200 FEET
CREATED BY: SEL	
JOB NO. 60646144	

N

*MW-110
383.84

*MW-8
390.35

MW-9
389.06

MW-10
389.94

MW-7
426.41

MW-11

410

420

400

390

bing

Legend

- Upgradient Monitoring Well
- Downgradient Monitoring Well
- Unit Boundary
- Property Line
- Bedrock Valley
- 5 ft Water Table Contour (Inferred from Available Monitoring Data)
- 10 ft Water Table Contour (Inferred from Available Monitoring Data)
- Groundwater Flow Direction
- 389.09 Groundwater Elevation (Feet, MSL) Measured September 24, 2020

*** Monitoring wells with artesian conditions are shown on this map with green labels**

MW-110 gauged on October 1, 2020

0 300 600
Feet

Big Rivers Electric Corporation

Reid/HMPL Surface Impoundment
Webster County, Kentucky

FIGURE 7
GROUNDWATER SURFACE MAP
SEPTEMBER 2020

DATE: 12/9/2020	SCALE: 1IN = 200 FEET
CREATED BY: TCC	
JOB NO. 60619822	

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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	Size / Type	Filter Pack Interval		Screened Interval		Bottom of Boring
		Lat	Long	TOIC (feet, NAD27)	GS (feet, NAD27)	(feet, TOIC)	(ID / Material)	(feet, GS, NAD27)		(feet, GS, NAD27)		(feet, GS)
Program Monitoring Wells								Top	Bottom	Top	Bottom	
MW-1 (8002-9625)	U / B	37.3817	-87.3030	423.23	420.2	45.5	4 inch / PVC	389.9	377.7	387.7	377.7	45
MW-2 (8002-9630)	D	37.3815	-87.3005	392.37	389.9	50.3	4 inch / PVC	354.1	342.1	352.1	342.1	49
MW-3A (8003-6430)	D	37.3806	-87.3005	386.48	380.7	41.3	4 inch / PVC	357.2	344.5	355.2	345.2	36.2
MW-4 (8002-9628)	D	37.3744	-87.3004	391.33	388.8	33.1	4 inch / PVC	370.2	358.2	368.2	358.2	33
MW-5 (8002-9627)	D	37.3741	-87.3010	390.18	387.7	27.5	4 inch / PVC	374.7	362.7	372.7	362.7	26
MW-6 (8002-9626)	D	37.3745	-87.3027	388.17	385.7	45.5	4 inch / PVC	354.9	342.7	352.7	342.7	45
Characterization Well												
MW-104 (8007-1139)	D / C	37.6305	-87.5010	395.13	392.47	60.84	2 inch / PVC	347.47	332.47	342.47	332.47	60

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

PVC = Polyvinyl chloride
ID = Internal Diameter
TOIC = Top of internal casing
GS = Ground Surface
U / B = Upgradient / Background
D = Downgradient
C = Characterization

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.		Location*		Reference Elevation*		Casing Length	Size / Type	Filter Pack Interval		Screened Interval		Bottom of Boring
		Lat	Long	TOIC (feet, NAD27)	GS (feet, NAD27)	(feet, TOIC)	(ID / Material)	(feet, GS, NAD27)		(feet, GS, NAD27)		(feet, GS)
Program Monitoring Wells								Top	Bottom	Top	Bottom	
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, NAD27 datum
PVC = Polyvinyl chloride
ID = Internal Diameter
TOIC = Top of internal casing
GS = Ground Surface
U / B = Upgradient / Background

TABLE 3

SUMMARY OF MONITORING WELL CONSTRUCTION, REID/HMPL SURFACE IMPOUNDMENT
CCR GROUNDWATER MONITORING PROGRAM

BIG RIVERS ELECTRIC CORPORATION - SEBREE STATION
REID/HMPL STATION SURFACE IMPOUNDMENT
WEBSTER COUNTY, KENTUCKY

Well No.		Location*		Reference Elevation*		Casing Length	Size / Type	Filter Pack Interval		Screened Interval		Bottom of Boring
		Lat	Long	TOIC (feet, NAD27)	GS (feet, NAD27)	(feet, TOIC)	(ID / Material)	(feet, GS, NAD27)		(feet, GS, NAD27)		(feet, GS)
								Top	Bottom	Top	Bottom	
Program Monitoring Wells												
MW-7 (8006-3934)	U / B	37.64931	-87.50306	444.43	441.80	75.5	2 inch / PVC	375.90	368.40	373.90	368.90	73.4
MW-8 (8006-3935)	D	37.64886	-87.50860	394.29	385.84	60.7	2 inch / PVC	340.64	331.64	338.64	333.64	54.2
MW-9 (8006-3936)	D	37.64730	-87.50717	395.40	392.85	47.6	2 inch / PVC	359.85	336.55	357.85	347.85	56.3
MW-10 (8006-3937)	D	37.64637	-87.50586	422.27	419.98	81.8	2 inch / PVC	352.48	339.98	350.48	340.48	80.0
Characterization Well												
MW-110 (8007-1138)	D / C	37.6477	-87.5105	388.7	382.14	65.56	2 inch / PVC	334.64	323.14	333.14	323.14	59.0

* Reference elevation of monitoring wells MW-7 through MW-10 surveyed by Associated Engineers, Inc., Madisonville, Kentucky, January 2015. Reference elevation of monitoring well MW-110 surveyed by Associated Engineers Inc., March 19, 2019. Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum

PVC = Polyvinyl chloride
ID = Internal Diameter
TOIC = Top of internal casing
GS = Ground Surface
U / B = Upgradient / Background
D = Downgradient
C = Characterization

TABLE 4

GROUNDWATER ELEVATIONS, GREEN LANDFILL - 2020

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

	GROUNDWATER MONITORING WELL PROGRAM													
	MW-1		MW-2		MW-3A		MW-4		MW-5		MW-6		MW-104	
Reference Elevation	**Upgradient/Background**		**Downgradient**		**Downgradient**		**Downgradient**		**Downgradient**		**Downgradient**		**Downgradient**	
TOIC*(ft, NAD27)	**423.23**		**392.37**		**386.48**		**391.33**		**390.18**		**388.17**		**395.13**	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/6/2020 - 4/7/2020	19.52	403.71	16.24	376.13	12.08	374.40	17.90	373.43	17.62	372.56	15.62	372.55	18.45[a]	376.68
9/22/2020	20.13	403.10	21.54	370.83	16.90	369.58	24.64	366.69	14.80	375.38	20.88	367.29	23.65[b]	371.48

*Reference elevation of monitoring wells surveyed by Fuller, Mossbarger, Scott and May, Civil Engineers, Inc., Lexington, Kentucky, December 1996, December 1999
Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum
TOIC = Top of internal casing
GW = Groundwater
GS = Ground Surface
NM = Not Measured
[a] = Measured on 4/17/2020
[b] = Measured on 10/1/2020

TABLE 5

GROUNDWATER ELEVATIONS, GREEN SURFACE IMPOUNDMENT - 2020
GREEN STATION SURFACE IMPOUNDMENT

BIG RIVERS ELECTRIC CORPORATION
SEBREE STATION
WEBSTER COUNTY, KENTUCKY

	GROUNDWATER MONITORING WELL PROGRAM							
	MW-11		MW-12		MW-13		MW-14	
Reference Elevation TOIC*(ft, NAD27)	Upgradient/Background 401.32		Downgradient 395.54		Downgradient 394.60		Downgradient 390.71	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/8/2020	10.27	391.05	22.15	373.39	19.42	375.18	17.85	372.86
9/25/2020	9.90	391.42	26.29	369.25	19.78	374.82	24.38	366.33

*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, NAD27 datum
TOIC = Top of internal casing
GW = Groundwater
GS = Ground Surface
NM = Not Measured

TABLE 6

GROUNDWATER ELEVATIONS, REID/HMPL SURFACE IMPOUNDMENT - 2020
REID/HMP&L STATION SURFACE IMPOUNDMENT

BIG RIVERS ELECTRIC CORPORATION
SEBREE STATION
WEBSTER COUNTY, KENTUCKY

	GROUNDWATER MONITORING WELL PROGRAM									
	MW-7		MW-8		MW-9		MW-10		MW-110	
Reference Elevation TOIC*(ft, NAD27)	**Upgradient/Background 444.43**		**Downgradient 394.29**		**Downgradient 395.40**		**Downgradient 422.27**		**Downgradient 388.70**	
Date Measured	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**	**Depth to Water (ft) (feet)**	**GW Elevation (feet)**
4/16/2020 - 4/17/2020	15.50	428.93	2.54	391.75	4.44	390.96	30.83	391.44	3.34	385.36
9/24/2020	18.02	426.41	3.94	390.35	6.34	389.06	32.33	389.94	4.86[a]	383.84

*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, NAD27 datum
TOIC = Top of internal casing
GW = Groundwater
GS = Ground Surface
NM = Not Measured
[a] = Measured on 10/1/2020

Appendix A
Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report

Final Groundwater and Non-Groundwater Corrective Action Remedy Selection Report

Green Landfill
Sebree Station
Webster County, Kentucky

Prepared for:

Big Rivers Electric Corporation
Sebree Generating Station
9000 Highway 2096
Robards, KY 42452

Prepared by:

AECOM Technical Services
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

AECOM PN 60626688

November 18, 2020

Certification Statement 40 CFR § 257.97(a) – Selection of a Remedy for the Corrective Action Program for Green Station CCR Landfill

Big Rivers Electric Corporation Sebree Generating Station, Green CCR Landfill

AECOM ("Consultant") has been retained by Big Rivers Electric Corporation to certify whether the selected groundwater remedy presented herein for the Green Station coal combustion residuals (CCR) landfill meets the requirements of Chapter 40 of the Code of Federal Regulations (CFR) §257.97.

LIMITATIONS

The signature of Consultant's authorized representative on this document represents that to the best of Consultant's knowledge, information, and belief in the exercise of its professional judgment, it is Consultant's professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by Consultant are made on the basis of Consultant's experience, qualifications, and professional judgment and are not to be construed as warranties or guaranties. In addition, opinions relating to environmental, geologic, and geotechnical conditions or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

CERTIFICATION

I, Brian Cole, being a Registered Professional Engineer in the State of Kentucky, certify to the best of my knowledge, information, and belief, that the remedy selected by Big Rivers Electric Corporation for the Green Station CCR Landfill meets the requirements of 40 CFR § 257.97, and that this certification is true and correct and has been prepared in accordance with generally accepted good engineering practices.

M. Brian Cole

_____

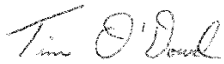
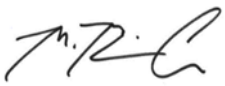
Printed Name

11/18/2020

_____

Date

Quality information

Prepared by	Checked by	Verified by	Approved by
			
Timothy P. O'Dowd, PG	Doug Gray, CGWP	M. Brian Cole, PE	Dennis P. Connair, PG
Project Manager	Principal Project Manager	Senior Civil Engineer	Principal Geologist

Revision History

Revision	Revision date	Details	Authorized	Name	Position
1	6-18-20				
2	8-18-20				
Final	10-5-20				
Amended Final	11-18-20				

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Appendicies

1. Introduction

In accordance with provisions of the United States Environmental Protection Agency's (USEPA) coal combustion residual (CCR) rule, Title 40 of the Code of Federal Regulations (CFR) Part 257.97, Big Rivers Electric Corperation (BREC) is required to select a remedy to address groundwater impacts identified at the Green Station CCR Landfill (the Unit) at the Sebree Generating Station located in Webster County, Robards, Kentucky **(Figure 1)**. Previous monitoring results indicate the presence of lithium at a Statistically Significant Level (SSL) above the Ground Water Protection Standard (GWPS) in four monitoring wells (MW-3A, MW-4, MW-5, and MW-6) at the Unit. In June 2019, BREC performed an Assessment of Corrective Measures (ACM) for the Unit to identify remedial alternatives to address groundwater impacts. A public meeting was held on July 16, 2020 in Henderson, Kentucky to dicuss the results of the ACM. No public input was received at this meeting. Additional technical assessment has been utilized by BREC to select the final remedy for the Unit in accordance with 40 CFR Part 257.97, which is presented in this report.

On December 16, 2019, an Agreed Order was filed with the Kentucky Office of Administrative Hearings between BREC and the Commonwealth of Kentucky, Energy and Environment Cabinet, Division of Waste Management (KDWM) to address Notices of Violation (NOVs) received in regard to unpermitted discharges and seepage emanating form the Unit (see Section 1.2). Within the AGREED ORDER are requirements for remedy selection reporting, including a timeline for review by the KDWM. These requirements are discussed in Paragraphs 18 and 23 of the Agreed Order and listed in Exhibit 4 to the Agreed Order. This report has been prepared to address these requirements in the Agreed Order and Exhibit 4 to the Agreed Order, in addition to the Federal CCR Rule requirements.

In parallel with addressing groundwater impacts, BREC performed an ACM for non-groundwater release surface seeps at the Unit in June 2019. In September and October 2019, BREC initiated interim corrective measures (ICMs) to address non-groundwater releases at the Unit. The ICMs are currently being evalauted through performance monitoring and are expected to benefit corrective action as a whole for the Unit. As a result, no separate remedy selection report is currently being developed for non-groundwater releases. BREC intendes for this report to address the remedy selection requirements for both groundwater and non-groundwater impacts under 40 CFR Part 257.

1.1 Regulatory Background

Kentucky Revised Statue (KRS) Chapter 224.50-760 governs the disposal of special waste, including utility wastes. The Commonwealth of Kentucky, Energy and Environment Cabinet (The Cabinet) promulgated regulations under Title 401 of the Kentucky Administrative Regulations (KAR) Chapters 45 and 46 to regulate the disposal of special wastes The Unit is a Kentucky permitted landfill (Permit No. SW11700007) subject to permitting requirements for special wastes established under 401 KAR Chapter 45.

In 2015 the USEPA promulgated 40 CFR Parts 257.50 through 257.107 which established national standards to govern the location, design, construction, and operation of landfills and surface impoundments utilized to manage CCR. In 2017, the Cabinet promulgated 401 KAR 46:110 which incorporates the federal CCR standards by reference into Kentucky regulations. As noted in the Agreed Order, the Unit is an existing CCR landfill under the Federal CCR rule and therefore subject to the operating criteria and corrective action standards of 401 KAR 46:110.

Corrective actions at the Unit are being performed to address both the federal requirements in 40 CFR Part 257 and state requirements in 401 KAR Chapter 46 as described below.

1.1.1 Federal CCR Background

In response to SSL exceedances in groundwater at the Unit, BREC evaluated the nature and extent of groundwater impacts as required by Title 40 CFR Part 257.95(g) for characterization monitoring.

Following chracterization monitoring, BREC performed an ACM, to identify potential corrective measures to address lithium impacts in groundwater pursuant to Title 40 CFR Part 257.96. A notice of ACM initiation dated January 14, 2019 was posted to BREC's publicly-accessible CCR reporting website. A report summarizing the results of the groundwater ACM (AECOM, June 2019) was posted to BREC's publicly-accessible CCR reporting website on June 14, 2019.

On March 15, 2018, the USEPA proposed a modification to the federal CCR regualtions to address four provisions within 40 CFR Section 257 that were remanded back to the USEPA on June 14, 2016 by the United States Court of Appeals for the District of Columbia Circuit. The proposed modifications to 40 CFR 257 (also known as the Remand Rule) also included provisions for owners and operators of CCR units in states that have approved CCR permit programs. Title 40 CFR Part 257.99 established procedures for owners and operators of CCR units to perforrm corrective action for eligible non-groundwater releases at a CCR unit. In alignment with corrective actions being performed to address the NOVs received from the KDWM for unpermitted discharges and seepage emanating from the Unit, BREC perfomed an ACM for non-groundwater releases in addition to the ACM for groundwater impacts. A report summarizing the results of the groundwater ACM (AECOM, June 2019) was posted to BREC's publicly-accessible CCR reporting website on June 28, 2019. In 2019, pursuant to 40 CFR Parts 257.90(d) and 257.84(b)(5), BREC initiated design of ICMs (i.e., containment systems) intended to reduce and prevent non-groundwater releases from reaching the Green River. In September and October 2019, BREC intiated construction of ICMs to address non-groundwater releases at the Unit (which are referred to herein as river seeps), including:

- Construction of a collection trench along the east side of the Green Landfill (refered to as the Deep Seep Collection Trench) to address seeps adjacent to the Green River; and

- Construction of a series of collection trenchs along the north side of the Green Landfill (refered to as the Northwest Seep Collection Trench) to address seeps near the northwest corner of the landfill discharging toward an east-flowing unnamed tributary to the Green River.

Construction of the ICMs was functionally completed in Janaury 2020, within the 180 day required timeframe required under proposed 40 CFR Part 257.99, although piping, pumping, and control system installation, and installation of supplemental collector systems were not completed until later in 2020. The ICMs completed to address non-groundwater releases under 40 CFR Part 257 and the Agreed Order are expected to benefit groundwater corrective action and are discussed collectively within this report (see Section 2.4).

Title 40 CFR Section 257.97(a) requires that progress reports be prepared on a semi-annual basis describing progress made in selecting and designing a remedy. The first Remedy Selection Progress Report was finalized on December 9, 2019 and posted to BREC's publicly-accessible CCR reporting website on December 12, 2019.

BREC held a public meeting on July 16, 2020 in Henderson, Kentucky to discuss the results of the Groundwater ACM in accordance with 40 CFR Part 257.96(e). No public input influencing the remedy for the Unit was received during the meeting. BREC has selected the remedy for groundwater and non-groundwater impacts at the Unit in accordance with 40 CFR Part 257.97 as detailed within this report.

1.1.2 Kentucky Division of Waste Management Background

On December 6, 2019, BREC signed Agreed Order #18-3-0138 with the KDWM to address NOVs received regarding unpermitted discharges and seepage emanating from the Unit. The Agreed Order was filed on December 16, 2019. Under the Agreed Order the following actions were required:

- Development of Standard Operating Procedures (SOPs) to characterize and mitigate leachate and seep releases to the surface (Exhibit 1);

- Development of construction and post-construction plans for implementing the Northwestern Seep Collection Trench Remedy (Exhibit 2);

- Development of construction and post-construction plans for implementing the Eastern “Deep Seep” Collection Trench Remedy (Exhibit 3); and
- Establishment of the process to complete the evaluation of groundwater corrective action remedies at the Unit pursuant to 401 KAR 46:110 (Exhibit 4).

Within Exhibit 4 of the Agreed Order, the following milestones for groundwater corrective action were identified:

1) Within 180 days of the entry of the Agreed Order, BREC shall conduct a public meeting as required by 40 CFR 257.96(e) and 401 KAR 46:110.
2) Within 90 days of the public meeting, BREC shall submit a draft groundwater remedy selection report for submittal to KDWM for a 30-day review and comment period.
3) As soon as possible, following receipt of KDWM comments on the draft groundwater remedy selection report, select the final groundwater corrective action remedy.
4) Posting of the Final *Groundwater and Non-Groundwater Corrective Action Remedy Selection Report* to BREC’s CCR Rule compliance website in accordance with 40 CFR 257.97 and 257.107 (no timeline specified).

Although the milestone schedule has been adjusted due to the COVID-19 pandemic, which prevented BREC from holding the public meeting at an earlier date, BREC has moved forward with the activities required in the Agreed Order as documented in this report. A revised schedule for corrective action implementation is discussed in Section 5.0.

2. Site Background

2.1 Site Description

BREC owns and operates Sebree Station, which is a coal-fired 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 is scheduled to be retired in 2020 pending regulatory approval from the Kentucky Public Service Commission and Rural Utilities Service. 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 in 1979 and 1981, respectively.

The location of the Green Landfill is illustrated on **Figure 1**. The Green Landfill is located directly south of Sebree Station, situated south of the Green Station CCR Surface Impoundment. The Green Landfill is a Kentucky permitted landfill (Permit No. SW11700007) that receives special wastes generated by burning coal (CCRs) from Green and Reid/HMP&L Stations. The landfill began receiving CCR wastes in 1980. The current Green Landfill footprint is approximately 170 acres.

As stated in the published CCR monitoring well network certification, available on the BREC website (http://www.bigrivers.com/), 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 (KGS) showed that at or immediately adjacent to the Site, there were a number of dry exploratory 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.

2.2 Groundwater Investigation Summary

Monitoring wells were installed at the Unit 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 Unit to determine the general direction of groundwater movement and to monitor groundwater impacts. One additional characterization monitoring well (MW-104) was installed downgradient of the Unit in 2018. All monitoring wells were installed in the uppermost saturated portion of the sandstone bedrock aquifer. A map illustrating the location of all program monitoring wells is presented as **Figure 2**.

Nine rounds of Baseline groundwater sampling for Appendix III constituents were conducted between March 2016 and October 2017. Statistical evaluation for Detection monitoring indicated that statistically significant increases (SSIs) over background had occurred, and therefore, Assessment monitoring was triggered. Detection monitoring activities and data are presented in the annual reports that have been prepared to date, (AECOM 2018, 2019, and 2020).

As part of Assessment monitoring, upgradient and downgradient wells for the Unit were sampled for Appendix IV constituents in June, July, and September 2018. GWPSs were established for the Appendix IV constituents occurring at SSIs (lithium only), and statistical evaluation of the lithium concentrations indicated exceedances of GWPSs at SSLs, as detailed in **Table 1** below.

Table 1. Green Landfill Constituents of Concern

Monitoring Well (Date)	Parameter Lithium GWPS 0.04 (mg/L)
MW-3A (Jun 2018)	**0.699**
MW-3A (Jul 2018)	**0.790**
MW-3A (Sep 2018)	**0.766**
MW-4 (Jun 2018)	**1.81**
MW-4 (Jul 2018)	**1.91**
MW-4(Sep 2018)	**1.81**
MW-5(Jun 2018)	**0.459**
MW-5 (Jul 2018)	**0.481**
MW-5 (Sep 2018)	**0.425**
MW-6 (Jun 2018)	**0.0650**
MW-6 (Jul 2018)	**0.0590**
MW-6 (Sep 2018)	**0.0558**

GWPSs are the greater of the site-specific background concentrations, the USEPA primary drinking water standard maximum contaminant limits (MCL), or GWPS provided in 40 CFR 257.95(3)(h)(2)

An additional characterization well, MW-104, was subsequently installed to estimate the downgradient extent of impacted groundwater. Sample collection from MW-104 for Appendix III and IV parameters took place in March and April 2019. The analytical results for lithium were below the GWPS. The additional characterization data are summarized in **Table 2** below.

Table 2. Green Landfill -2019 Characterization Sample Results

Monitoring Well (Date)	Parameter
	Lithium GWPS 0.04 [a] (mg/L)
MW-104 (March 2019)	0.0281
MW-104 (April 2019)	0.0288

a The Upper Prediction Limit for lithium was calculated as 0.008 mg/L.

The results from both characterization sampling events helped to confirm the downgradient (southwestern) extent of constituent of concern (COC) impacts above GWPS at the Unit.

Semi-annual Assessment monitoring continued at the Unit in 2019 and 2020 in accordance with 40 CFR 257.95.

2.3 Conceptual Site Model

Development and refinement of a Conceptual Site Model (CSM) is necessary to support remedy selection for the Unit. A CSM is based on a set of working hypotheses regarding how contaminants of concern (COCs) entered the environment at a site, how they were and continue to be transported to various media, what the potential routes of exposure are, and who may be exposed, including both human and ecological receptors. As such, the CSM is a "living" model. As new data become available or site conditions change, a CSM should be evaluated and updated as necessary.

The CSM for the Unit was first provided in the June 2019 ACM for the Unit (AECOM 2019). The CSM presents the physical setting of the Unit (adjacent to the Green River), the unconsolidated and bedrock geologic strata underling the Unit, the occurrence and movement of groundwater, the distribution of COCs in groundwater, and the potential receptors (or lack thereof) for impacted groundwater. These elements are described in detail below and have been updated with new information for this report as appropriate.

2.3.1 Physical Setting

The Unit is located within the Interior Low Plateaus physiographic province. The province is part of the Interior Plains division of the United States. Characteristic features of the province include unglaciated rolling limestone plains with alluvial valleys and entrenched rivers and streams. Several large rivers are in the region, including the Green, Ohio, Kentucky, Tennessee, and the Cumberland Rivers. The geology underlying the Unit 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 Unit 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 [ft., amsl] (at the north end of the landfill) and 397 ft., amsl (at the south end of the landfill), with a maximum elevation of 608 ft., amsl at the landfill crest. Precipitation falling within the Green Landfill is directed to ponds on the north and south sides of the Unit and then to the river under Kentucky Pollution Discharge and Elimination System (KPDES) permit No. KY0001929. Underlying preconstruction soils consisted of Loring-Grenada, Loring-Zanesville-Wellston (Henderson County) and Loring-Wellston-Zanesville (Webster County) soil associations which are generally characterized as well drained to moderately well drained soils on nearly level to sloping uplands (Associated Engineers 2016, Hydrologic and Hydraulic Capacity Assessment and Initial Inflow Design Flood Control System Plan).

2.3.2 Geology

The Unit lies in the Western Kentucky Coalfields section, characterized by rolling uplands underlain by coal-bearing bedrock of the Pennsylvanian Period. Near the Unit, maximum topographic relief is on the order of 80 feet. The geologic quadrangle (Geologic map of the Robards quadrangle, Henderson and Webster Counties, Kentucky, 1973) for the area published by the Kentucky Geologic Survey (KGS) shows the surficial material in portions of the western half of the Unit to be unconsolidated loess representing the Pleistocene geologic epoch. The loess consists of sandy and clayey silt. Underlying the loess deposits and exposed at the surface on the eastern half of the Unit are broadly distributed Pleistocene and Holocene alluvium deposits consisting of intermixed and interlensing clay, silt, sand, and gravel. In close proximity to the Unit, the alluvium is generally a low permeability unit that forms terraces along the Green River at elevations of roughly 380 and 395 ft., amsl. The unconsolidated surficial materials range from approximately 10 feet (MW-5) to 52 feet (MW-104) in thickness surrounding the Unit. **Figure 3** provides an excerpt from the geologic quadrangle for the immediate area surrounding the Unit.

The unconsolidated materials are underlain by bedrock 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 two distinct limestone beds separated by a sandy shale. The member is exposed in a streambed near the northwest corner of the Unit but is absent beneath much of the Unit footprint due to erosional channeling.

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 lithologic units of the Carbondale tend to be lenticular bodies rather than continuous sheet-like strata. Gradational and abrupt horizontal changes in lithology are often encountered.

Cross-sections have been developed to support the CSM and are presented as **Figures 4, 5, 6** and **7**. Cross-section locations are shown on **Figure 2**. These sections illustrate the sequence of geologic materials present under the Unit as interpreted using the currently available data.

2.3.3 Groundwater Hydrogeology

For purposes of compliance with the CCR Rule groundwater monitoring requirements, the interbedded sandstone and shale of the Carbondale Formation is considered the uppermost aquifer underlying the Unit. The uppermost aquifer is hydraulically confined and first encountered at an elevation of approximately 401 ft., amsl at the northwest end of the landfill, and 367 ft., amsl at the southeast end of the landfill (AECOM, 2019).

Groundwater elevation data collected in April 2020 are summarized on **Table 3** below. These data were utilized to construct a piezometric surface map illustrating groundwater flow conditions for the uppermost aquifer (see **Figure 8**). Overall groundwater flow beneath the footprint of the Unit is to the east towards the Green River and south-southeast towards Groves Creek.

Table 3. Green Landfill -April 2020 Groundwater Elevation Data

Monitoring Well	Top of Casing Elevation (ft) [1]	Depth to Groundwater (ft)	Groundwater Elevation (ft, amsl)
MW-1	423.23	19.52	403.71
MW-2	392.37	16.24	376.13
MW-3A	386.48	12.08	374.40
MW-4	391.33	17.90	373.43
MW-5	390.18	17.62	372.56
MW-6	388.17	15.62	372.55
MW-12 [2]	395.54	22.15	373.39

1 Reference elevation of monitoring wells surveyed by Fuller, Mossbarger, Scott and May, Civil Engineers, Inc., Lexington, Kentucky, December 1996, December 1999. Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum.
2. MW-12 is utilized for collection of piezometric data only and is not part of the CCR monitoring well network for the Green Landfill.

Slug tests were performed on April 25, 2019 at monitoring wells MW-3A, MW-4, MW-6, and MW-104 to assess the hydraulic characteristics of the uppermost aquifer. The estimated hydraulic conductivity of the monitoring wells tested ranged from 2×10^{-5} to 3×10^{-3} centimeters per second (cm/sec).

Although previous site-specific investigations have noted the presence of perched zones of saturation in the overlying unconsolidated materials, these discontinuous zones do not qualify as an uppermost aquifer under the CCR Rule because they do not produce usable quantities of groundwater (40CFR Part 257.53).

2.3.4 Non-Groundwater Hydrogeology

Two types of non-groundwater releases have been identified through inspection and investigation of the Unit: river seeps and perimeter seeps. The river seeps are those found along the Green River and its tributary streams. River seeps have been observed on the bank of the river/tributary and on the slope between the river/tributary and the landfill perimeter road. The river seeps on the northwest side of the

landfill drain to a KPDES permitted outfall, whereas the river seeps on the Green River side do not. Perimeter seeps are more surficial in nature and have been observed in various surface ditches located around the perimeter of the Green Landfill, all of which drain to sedimentation basins that discharge to a KPDES permitted outfall.

2.3.4.1 River Seeps

An investigation of the seeps along the Green River was conducted in July 2018 and was reported in a Technical Memorandum from AECOM to BREC dated September 6, 2018. The results of laboratory analysis of seep samples collected during this investigation are summarized in **Appendix A**. During this investigation, the banks of the Green River were surveyed by boat for evidence of seepage. The survey was conducted when the river stage had retreated to a low pool after a prolonged elevated stage so that the maximum number of seeps might be surveyed, and seepage rates might be high enough to allow sampling. Samples of seeps having visible flow were collected and tested for CCR indicator parameters (40 CFR Part 257 Appendix III), CCR constituents of concern (40 CFR Part 257 Appendix IV), and general chemistry parameters. The data from these analyses were used to evaluate whether individual seeps were likely associated with the Landfill.

Riverbank seeps were identified at sixteen discrete locations in the vicinity of Sebree Station. Seeps were recorded at locations on both the east and west banks of the river over two miles upstream of the landfill footprint and over 1.5 miles downstream of the landfill footprint. Some seeps appeared to potentially be associated with a surface water drainage feature, such as RS-11 where there appears to be a beaver pond beyond the riverbank, but most emanated from otherwise nondescript sections of riverbank. Some of the seeps resulted in a green discoloration of the riverbank, but most had orange staining.

Of the seven seeps tested, only three, RS-05, RS-07, and RS-08 as illustrated on Figure 1 in **Appendix A**, were found to have similar chemistry to leachate generated by the Green Landfill. These seeps did not differ greatly from the majority of the other riverbank seeps in that they were broadly seeping from the bank sediments and had a general orange discoloration, except that RS-07 had a some relatively discrete seepage points emanating from a few feet higher on the bank and RS-08 appeared to be emanating from on top of bedrock outcropping on the river bank. Seeps RS-05 and RS-07 are located near the center of the Landfill between monitoring wells MW-2 and MW-3A. This is the same area in which seeps have been observed higher on the slope between the river and the perimeter road, suggesting that they have a similar origin. Seep RS-08 is located adjacent to the South Sediment Basin and appears to be tied to that surface water feature. The approximate vertical position of the river seep locations relative to the Green Landfill are shown on **Figure 4**. It should be noted that the seep designated RS-06, located between RS-05 and RS-07, is likely to be of similar character and origin but was not generating enough flow to be sampled at the time of the survey.

The analytical results from the July 2018 river seep samples were compared to Kentucky Water Quality criteria for warm water aquatic habitat identified in 401 KAR 10:031 Section 6. Where there are no Kentucky Water Quality criteria for a specific constituent, the USEPA Region 4 surface water screening values were utilized for comparison. It should be noted that the Region 4 screening values are not compliance criteria, but rather values used to determine whether further evaluation is warranted. Samples from RS-05, -07 and -08 were found to exceed the 600 milligrams per liter (mg/L) limit for chloride. RS-05 also exceeded the current criteria for cadmium (0.00029 mg/L) and lead (0.0036 mg/L), but Kentucky has introduced a new cadmium criterion that may bring RS-05 back into compliance. Follow-up sampling conducted in December 2018 by the Kentucky Division of Water (KDoW) and BREC confirmed the exceedance of the chloride criteria. Accordingly, this parameter (chloride) is regarded as the primary COC for non-groundwater releases at the Unit requiring corrective action. Addressing the river seeps was included as a stipulation in the Agreed Order signed between BREC and the KDWM.

The analytical results for the river seep samples are summarized in **Appendix A**. Presented in parallel with the river seep results are deep in-stream river samples that were collected immediately adjacent to the river seeps to characterize the river water quality that is most likely to be impacted by seepage. The

deep samples were collected within 1 foot of the riverbed within 3 to 5 feet of the water line. None of the river sample results exceed the water quality or screening criteria suggesting that the identified river seeps are not impacting the Green River.

Additional data regarding the river seeps is provided in the *Assessment of Corrective Measures Non-Groundwater Release Under the CCR Rule, Green Station CCR Landfill* (AECOM June 28, 2019).

In April 2019, inspection of the Landfill site by the KDWM and KDoW identified an area of seepage outside the perimeter road on the northwest side of the Landfill (see **Figure 2**). This seepage (herein identified as the NW Seep) is adjacent to a tributary ditch that flows eastward to an unnamed outfall which has a KPDES discharge permit. The outfall was sampled by KDoW and BREC on April 2, 2019. A sample from this seep area (identified as sample 023) was collected by BREC personnel on April 11, 2019. The results indicated that the seep sample exceeded Kentucky Warm Water Aquatic Habitat criteria for Chronic Exposure for chloride and cadmium. As a result, this area was identified for corrective action. Addressing this seep area was included as a stipulation in the Agreed Order signed between BREC and the KDWM.

Photo 1: Bedrock outcrop located west of the NW Seep as observed on April 2, 2019.

The NW Seep appears to emanate from a horizon in or above a natural limestone ledge adjacent to the ditch. This conclusion is based on the observation of natural springs of groundwater upstream from the seep that clearly flows from fractures in the ledge. A series of three soil borings drilled between the landfill and the NW Seep area in May 2019 further suggest the seepage is controlled by this feature. **Figure 7** provides a cross-section illustrating the sequence of geologic materials present within the NW seep area as interpreted using the currently available data.

2.3.4.2 Perimeter Seeps

During the July 2018 investigation of Green River seeps, the area inside the Landfill perimeter road was also inspected for seeps. Four areas of perimeter seepage were identified (see **Figure 2**): along the west side of the landfill (LS-01), the southwest corner (LS-04), the south end adjacent to the South Sediment Basin (LS03), and the east side north of MW-2 vicinity (LS02). LS-01, LS-02 LS-03, and LS-04 are directed to the South Sediment Basin, which is pumped to the Northeast Sediment Basin and then further to the Green surface impoundment and eventually discharged to the Green River under KPDES permitted outfall #001.

Samples of a select set of these perimeter seeps were collected in July 2018 and tested for the Appendix III, Appendix IV, and general chemistry parameters. As previously noted, these seeps do not directly discharge to surface waters, but they may have the potential to influence groundwater and other non-groundwater releases. As such, they will be addressed by future corrective action to manage those potentials (see Section 4).

Additional data regarding the perimeter seeps is provided in the *Assessment of Corrective Measures Non-Groundwater Release Under the CCR Rule, Green Station CCR Landfill* (AECOM June 28,2019).

2.3.5 Constituents of Concern

Groundwater analytical data obtained from groundwater sampling events performed at the Unit through 2019 are summarized in **Appendix B**. A summary of the statistical evaluation conducted on the Appendix III and Assessment Appendix IV parameters for the Green Landfill is provided in **Appendix C**. Combined, these data indicate that the only COC detected at SSLs above its GWPS in groundwater at the Unit is lithium. Lithium has been detected at SSLs in the wells MW-4, MW-5, and MW-6 surrounding the South Sediment Basin and in MW-3A located north (downstream on the Green River) of MW-4.

Chloride is regarded as the primary COC for non-groundwater releases at the Unit requiring corrective action. Although there have been Appendix IV (Part 257) constituents detected in the surface seeps identified within the perimeter footprint of the landfill, these seeps are contained within a KPDES permitted discharge area that are monitored routinely to ensure compliance with applicable surface water quality standards.

2.3.6 Impacted Media

Both groundwater and surface water have been identified as impacted media of concern requiring corrective measures at the Unit.

2.3.7 Distribution of COCs

Groundwater sampling was performed at the Unit most recently in April 2020. Laboratory analytical data from the April 2020 sampling event is provided in **Appendix D**. The additional lithium data collected during this event are summarized below in **Table 4**.

Table 4. Green Landfill - April 2020 Lithium Analytical Results

Monitoring Well (Date)	Parameter
	Lithium GWPS 0.04 (mg/L)
MW-1	0.03
MW-2	0.007
MW-3A	0.68
MW-4	0.82
MW-5	0.38
MW-6	0.05

Figure 9 illustrates the distribution of COCs and other groundwater quality constituents in groundwater at the Unit. This distribution of COCs in groundwater suggests that impacts to groundwater likely originate from two primary source area. Impacts observed at MW-4, MW-5 and MW-6 likely originated as infiltration from the South Sediment Basin where storm water and landfill seepage accumulate on the south side of the landfill before being pumped to the Green Surface Impoundment. Data from characterization well MW-104 indicate that MW-3A may be effectively separated from the South Sediment Basin by a buried valley in the bedrock aquifer where groundwater does not appear to be impacted. This suggests that the impact observed at MW-3A may have instead originated from a different source, potentially from localized landfill seepage, which is now captured by the Deep Seep Collection Trench (see Section 2.4). It is possible that the MW-3A impact originates from the western end of the South Sediment Basin, but there is currently no feasible means of directly tracing that potential under the footprint of the landfill. It is, however, possible to evaluate this potential by monitoring MW-3A over time after the South Sediment Basin is rehabilitated as is currently planned (see Section 4). Ongoing monitoring of MW-3A also has the potential to demonstrate whether the landfill seepage intercepted by the Deep Seep Collection Trench is the source of impact.

2.3.8 Potential Receptors/Exposure Pathways

Contact with water (e.g., shallow groundwater or surface water) impacted by COCs at levels above GWPS or Water Quality Criteria is regarded as the potential pathway for exposure of potential receptors. Based on data published by KGS, there are no known groundwater wells used for drinking water within a 1-mile radius of the Unit, thus limiting the potential receptors to the surface water, i.e., the Green River and its tributary, Groves Creek. The potential pathways to these receptors include seepage of water from the Unit through manmade and natural hydraulic conduits.

Other potential exposure pathways (e.g., soil or vapor) are not considered a risk as the CCR material is isolated in the Unit. This isolation prevents direct access by individuals that might result in direct contact or ingestion. In addition, the inherent non-volatile nature of the Unit-specific COCs eliminates the potential for a complete vapor pathway (i.e., vapor intrusion to indoor air).

2.4 Interim Corrective Measures

In September and October 2019, BREC initiated design and construction of two containment systems intended as an interim corrective measure to reduce and prevent non-groundwater releases at the Unit from reaching the Green River. The containment systems are identified as the Deep Seep Collection Trench (also known as the Eastern Collection Trench) and the Northwest Seep Collection Trench.

No formal interim corrective measures have been performed at the Green Landfill to address groundwater impacts. However, the interim corrective measures for known non-groundwater releases completed at the Unit are expected to benefit corrective action for groundwater impacts. The compatibility of those corrective measures with potential groundwater remedies is currently being evaluated as part of the Unit's assessment monitoring and will continued to be evaluated in the future as part of systematic performance reviews (see Section 5.2).

2.4.1 Deep Seep Collection Trench

BREC began construction of the Deep Seep Collection Trench on October 7, 2019. The installation of four partially overlapping trenches and corresponding individual sumps was completed on November 11, 2019. This completion allowed removal of collected seepage using temporary pumping and piping until the permanent system components were completed.

The Deep Seep Collection Trench is located on the eastern side of the landfill, adjacent to the Green River. This collection system consists of 1,065 lineal feet of perforated (HDPE) pipe and four (4) stainless steel sumps. The HDPE perforated pipe is surrounded by a washed river gravel, with profiles set at a 0.5% slope toward the associated pumping (sump) station. Each section of HDPE pipe overlaps at the sump interconnection to prevent seepage bypass and to ensure all deep seeps are properly captured. Each sump was set at an elevation of 352 ft., amsl. The approximate vertical position of the

Photo 2: Installation of the Deep Seep Collection Trench in October 2019.

Deep Seep Collection Trench relative to the Green Landfill is shown on **Figure 4**. The location of the trench in plan view is provided on **Figure 10**.

The electrical and mechanical portion of the project that allows the system to become fully automated was finalized on May 29, 2020.

2.4.2 Northwest Seep Collection Trench

Photo 3: Installation of the Northwest Seep Collection Trench in September 2019.

BREC began construction of the Northwest Seep Collection Trench on September 3, 2019. The construction of the collection trench was completed on January 22, 2020. The system is located in the northwest corner of the landfill and consists of 357 lineal feet of HDPE perforated pipe within the primary collection trench installed at an elevation of 391.4 ft, amsl. The HDPE perforated pipe is surrounded by a washed river gravel, with profiles set at a 0.5% slope toward the associated pumping (sump) station. Since the installation of the primary trench, BREC has installed two relay stations to ensure all possible seeps are captured and pumped to a permitted KPDES outfall. The Northwest Seep Collection Trench is configured to pump the incoming flow to a target manhole, which is located on the northeast corner of the landfill. The target manhole subsequently discharges to KPDES permitted outfall #009. The approximate vertical position of the Northwest Seep Collection Trench relative to the Green Landfill is shown on **Figure 7**. The location of the trench in plan view is provided on **Figure 10**.

2.5 Assessment of Corrective Measures Summary

2.5.1 Assessment of Corrective Measures for Groundwater Impacts

In June 2019, BREC performed an ACM for the Unit to identify remedial alternatives to address groundwater impacts. Title 40 CFR Section 257.96(c) requires that the ACM include an analysis of the effectiveness of potential corrective measures in meeting the objectives for remedies identified under Section 257.97(b), by addressing at least the following:

1) The performance, reliability, ease of implementation, and potential impacts of appropriate potential remedies, including safety impacts, cross-media impacts, and control of exposure to any residual contamination;
2) The time required to begin and complete the remedy; and
3) The institutional requirements, such as state or local permit requirements or other environmental or public health requirements that may substantially affect implementation of the remedy(s).

As part of the groundwater ACM, several potential corrective measures technologies were evaluated to identify which ones could be carried forward as components of corrective measures alternatives. The results of the corrective measures technology evaluation are presented below in **Table 5**.

Table 5 – Potential Corrective Measures Options for Groundwater Impacts

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as standalone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established Corrective Action Objectives (CAOs).
Institutional Controls (ICs)	Retained as supplement to corrective measures alternatives	The use of ICs (i.e., Environmental Covenant, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of corrective measures alternatives.
Groundwater Monitoring (Assessment and Detection mode)	Retained as supplement to corrective measures alternatives	The use of groundwater monitoring (Assessment and/or Detection modes as appropriate) when combined with other applicable technologies as part of any proposed corrective measures alternative is retained to address the CAO and to track the effectiveness of the overall remedy. However, it is not retained as a standalone technology.
Hydraulic Containment	Retained	The use of hydraulic containment is retained because it is an effective means of preventing offsite migration of soluble contaminants. Hydraulic containment requires management and potential ex-situ treatment of extracted groundwater, so it is not a stand-alone technology. The CSM will guide the design of any groundwater extraction system to optimize the total discharge of groundwater needed to provide hydraulic containment.
Physical Containment	Retained	The use of physical containment is retained because it can be an effective means of managing groundwater flow. Physical containment often requires pairing with hydraulic containment and/or in-situ treatment (funnel and gate style) to manage the flux of groundwater flow into the system. The CSM will guide the design of any physical barrier system, but technology limitations increase implementation difficulty with scale.
Ex-situ Treatment (Physical, Chemical or Biological)	Retained	Ex-situ treatment technologies are retained as a way of removing contaminants from extracted groundwater from a hydraulic containment system. Ex-situ treatment may be paired with wastewater treatment, non-groundwater release treatment systems, or with permitted discharge to manage groundwater contamination. The CSM and data gaps investigations will guide the design of any ex-situ treatment
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.

Potentially Applicable Technology	Status	Description/Overview
Other Source Control Technologies	Retained	Control of source area non-groundwater related releases. For the purposes of this groundwater ACM, management of non-groundwater releases are not included in the alternatives evaluation. Engineering measures, including leachate collection, lining of trenches and/or ponds, and other isolation methods are regarded as part of closure technologies selected by other means.

Note: Technologies that were retained may be used as components of a corrective action alternative, but when evaluated in conjunction with other available technologies any single technology may not be utilized.

Preliminary assembly of corrective measures alternatives was performed based on site-specific and regional geology and groundwater conditions. For the Unit, six corrective measures alternatives were developed from this list of applicable corrective measures technologies during the ACM screening process:

- 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, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring
- Alternative #4 – CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
- Alternative #5 – CiP, Other Source Control, ICs, and Groundwater Monitoring

The assembly of corrective measures alternatives presented in the ACM was considered preliminary and subject to revision following additional evaluation during the remedy selection process and/or following comment from the regulatory community and public. Further evaluation of the alternatives is discussed in the following sections.

2.5.2 Assessment of Corrective Measures for Non-Groundwater Impacts

Pursuant to Title 40 of the Code of Federal Regulations (CFR) parts 257.90(d) and 257.84(b)(5), BREC initiated design of containment systems intended to reduce and prevent non-groundwater releases from reaching the Green River as an interim corrective measure. Plans for these measures were submitted to the KDWM for review and comment in 2019. KDWM conditionally approved the interim corrective measures for implementation at the Unit and they were constructed in 2019 and 2020 (see Section 2.4).

In June 2019, BREC performed an ACM to evaluate whether additional remedial measures, that would be supplemental to the ICMs already planned, were warranted to address non-groundwater releases. Several potential corrective measures technologies were evaluated in order to identify which ones could be carried forward as components of corrective measure alternatives for non-groundwater releases, if required. The results of the corrective measures technology evaluation are presented below in **Table 6**.

Table 6 – Potential Corrective Measures Options for Non-Groundwater Impacts

Potentially Applicable Technology	Status	Description/Overview
No Action	Not retained as stand-alone technology, but carried forward for baseline comparisons	This technology has been included in the preliminary evaluation/screening but is not retained because it will not meet the established CAOs.

Potentially Applicable Technology	Status	Description/Overview
Hydraulic Containment	Retained	Hydraulic containment in the form of pumping of vertical or horizontal wells would potentially be used to provide spot control of seepage if the interim corrective measures are unable to fully capture the seepage.
Physical Containment	Retained	Physical containment in the form of a cutoff wall would potentially be used to re-direct or otherwise intercept seepage that was not adequately captured by the interim corrective measures.
Ex-situ Physical/Chemical/Biological Treatment	Retained	Ex-situ treatment is retained as a potential supplement to the interim corrective measures in the event that discharge via the station's KPDES permit is not possible.
In-situ Physical/Chemical Treatment	Retained	In-situ treatment is retained in the form of spot treatment or fixation of seepage areas in the event that the interim corrective measures do not adequately address all seepage areas.
Permeable Reactive Barriers (PRB)	Retained	The use of PRBs is retained in the form of a reactive cell in the event that interim measures result in seepage concentrations that require pre-treatment in-situ prior to discharge.
Closure in Place (CiP) (of the regulated unit)	Retained	The use of CiP as a source control technology and is amenable with respect to CAO attainment.
Closure by Removal (CbR) (of the regulated unit)	Retained	The use of CbR as a source control technology is amenable with respect to CAO attainment.
Other Source Control Technologies	Retained	Control of source area non-groundwater releases is being implemented as interim corrective measures but is retained in the event that interim measures need to be evaluated for expansion.

The ICMs implemented at the Unit in 2019 were designed to address river seepage and divert it to KPDES outfalls, eliminating any potential exposure to public health or the environment. During ACM development, it was anticipated that the ICMs would meet the CAOs by effectively eliminating any future river seepage through source control, and as a result, no supplemental remedies were considered warranted. Data collected at the Unit since installation of the ICMs suggests that the CAOs are being met and in compliance with the conditions of the Agreed Order.

Performance monitoring is ongoing and will continue to be performed in the future to demonstrate source control and evaluate the ability of the ICMs to meet the CAO. The ICMs implemented at the Unit in 2019 and 2020 are considered the final remedy for non-groundwater releases and are expected to benefit corrective action as a whole for the Unit. As a result, no separate remedy selection report is currently being developed for non-groundwater releases. If warranted based on performance monitoring results, additional evaluation of the non-groundwater corrective measures will be performed consistent with 40 CFR 257.98(b).

3. Corrective Measure Evaluation

To address the remedy selection requirement under 40 CFR Part 257.97, a corrective measure evaluation was performed to address groundwater impacts at the Unit. Currently, no separate corrective measure evaluation is planned for non-groundwater releases, as the ICMs implemented at the Unit in 2019 and 2020 are considered the final remedy for non-groundwater releases. The discussion included below details the evaluation performed to address groundwater impacts at the Unit.

3.1 Corrective Action Objectives

Corrective Action Objectives (CAOs) for the Unit were identified during the groundwater ACM completed for the Unit in June 2019. CAOs are overall descriptions of what remedial action is expected to accomplish at a given site. CAOs also provide a basis for evaluating the performance of a corrective measure. Title 40 CFR Section 257.97 (b) outlines the CAOs for corrective measures under the CCR Rule as follows:

(1) Be protective of human health and the environment;

(2) Attain the GWPS as specified pursuant to Section 257.95(h);

(3) Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents into the environment;

(4) Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems;

(5) Comply with standards for management of wastes as specified in Section 257.98(d). [note: this statute refences all applicable requirements under the Resource Conservation and Recovery Act (RCRA)].

The corrective measure alternative selected for the Unit must ultimately demonstrate attainment of the CAOs. Compliance with the CAOs will be a primary factor in determining the effectiveness of the corrective measure alternative selected for the Unit during future systematic performance reviews.

Each of the CAOs have been adopted as Threshold Criteria (see Section 3.3.1 below) for evaluating potential corrective measures in alignment with 40 CFR Part 257.97 (b).

3.2 Corrective Measures Alternatives Assembly

The groundwater ACM performed for the Unit in June 2019 identified a total of six (6) corrective measures alternatives to be carried forward into the remedy selection process. In December 2019, BREC provided a *Semi-annual Remedy Selection Progress Report* (AECOM, December 2019) as required under 40 CFR 257.97(a). As part of this submittal, two (2) corrective measures alternatives were eliminated from further consideration, including:

- Alternative #1 (No Action and Groundwater Monitoring) – This alternative does not control or remove COCs from the environment and therefore does not achieve the RAOs.
- Alternative #2b – (CbR, ICs, and Groundwater Monitoring) – Implementing a CbR approach is considered cost prohibitive. In addition, any CbR approach would require relocating waste to an existing disposal unit or construction of a new waste disposal unit, which does not align with the one of the fundamental goals of RCRA (conserving energy and natural resources).

Four (4) potential corrective measures alternatives have been identified by BREC as viable options to address lithium impacts in groundwater and non-groundwater releases at the Unit, including:

- Alternative #2a (Alt 2a): CiP, ICs, and Groundwater Monitoring

- Alternative #3 (Alt 3): CiP, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring
- Alternative #4 (Alt 4): CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
- Alternative #5 (Alt 5): CiP, Other Source Control, ICs, and Groundwater Monitoring

Each of the remining 4 corrective measures alternatives was evaluated against the threshold, balancing, and modifying criteria as discussed below.

3.3 Corrective Measures Criteria Evaluation

40 CFR Part 257.97(a) outlines the criteria for evaluating corrective measures under the Federal CCR Rule. Although not specifically stated as such, these criteria mirror the criteria outlined for the National Oil and Hazardous Substance Contingency Plan, more commonly referred to as the National Contingency Plan (NCP), established under 40 CFR 300. 40 CFR 300.430 identifies 9 criteria for evaluating remedial alternatives which are further divided into 3 categories:

1) Threshold Criteria;
2) Balancing Criteria, and
3) Modifying Criteria.

These criteria were utilized by BREC to evaluate the potential corrective measures alternatives for the Unit. Each of the remaining 4 corrective measures alternatives was evaluated against each other and scored on a scale from 1 to 4 (1 being lowest and 4 being highest). Where multiple corrective measures alternatives were considered equal with respect to a given criteria, the available points were combined and divided equally. The results of analysis performed to evaluate each of the corrective measures alternative is discussed below and summarized in **Appendix E**.

3.3.1 Threshold Criteria Evaluation

Title 40 CFR Part 257.97 (b) outlines the threshold criteria (also viewed as CAOs) for evaluating corrective measures under the CCR Rule, and these criteria were presented in Section 3.1 above. The results of the threshold criteria evaluation are summarized below in **Table 7**.

Table 7. Threshold Criteria Evaluation Summary

40 CFR 257.97 Reference	Alternative 2a	Alternative 3	Alternative 4	Alternative 5
(b)(1)	1	3	3	3
(b)(2)	1	3.5	2	3.5
(b)(3)	1	3	2	4
(b)(4)	1	3	2	4
(b)(5)	2.5	2.5	2.5	2.5

Further detail regarding how threshold criteria were evaluated in provided on Table E-2 in **Appendix E**.

3.3.2 Balancing Criteria Evaluation

Title 40 CFR Section 257.97 (c) outlines the balancing criteria for evaluating corrective measures under the CCR Rule as follows:

1) The long and short-term effectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on a consideration of the following:

i. Magnitude of reduction of existing risks;
ii. Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy;
iii. The type and degree of long-term management required, including monitoring, operation, and maintenance;
iv. Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant;
v. Time until full protection is achieved;
vi. Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment;
vii. Long-term reliability of the engineering and institutional controls; and
viii Potential need for replacement of the remedy

2) The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:
   i. The extent to which containment practices will reduce further releases; and
   ii. The extent to which treatment technologies may be used.

3) The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors:
   i. Degree of difficulty associated with constructing the technology;
   ii. Expected operational reliability of the technologies;
   iii. Need to coordinate with and obtain necessary approvals and permits from other agencies;
   iv. Availability of necessary equipment and specialists; and
   v. Available capacity and location of needed treatment, storage, and disposal services.

The results of the threshold criteria evaluation are summarized below in **Table 8**.

Table 8. Balancing Criteria Evaluation Summary

40 CFR 257.97 Reference	Alternative 2a	Alternative 3	Alternative 4	Alternative 5
(c)(1)(i)	1	4	3	2
(c)(1)(ii)	1	3.5	3.5	2
(c)(1)(iii)	1	2.5	2.5	4
(c)(1)(iv)	1	3	2	4
(c)(1)(v)	1	3	2	4
(c)(1)(vi)	1	3	2	4
(c)(1)(vii)	1	3	2	4
(c)(1)(viii)	4	2	1	3
(c)(2)(i)	1	3	2	4
(c)(2)(ii)	1	4	3	2
(c)(3)(i)	4	2	1	3
(c)(3)(ii)	4	2	1	3
(c)(3)(iii)	2.5	2.5	2.5	2.5
(c)(3)(iv)	4	2	1	3

(c)(3)(v)	1	2	3	4

Further detail regarding how threshold criteria were evaluated in provided on Table E-3 in **Appendix E**.

3.3.3 Modifying Criteria Evaluation

Title 40 CFR Section 257.97 (c) defines modifying criteria as “the degree to which community concerns are addressed by a potential remedy(s)”. Given that an Agreed Order was signed between BREC and the KDWM for the Unit, the modifying criteria were expanded as part of this evaluation to include separate criteria for state and community acceptance (40 CFR 300.430 divides modifying criteria into two categories).

The results of the modifying criteria evaluation are summarized below in **Table 9**.

Table 9. Modifying Criteria Evaluation Summary

40 CFR 257.97 Reference	Alternative 2a	Alternative 3	Alternative 4	Alternative 5
NA - state acceptance	1	3.5	3.5	2
(c)(4)	1	3.5	3.5	2

Further detail regarding how threshold criteria were evaluated in provided on Table E-4 in **Appendix E**.

3.3.4 Corrective Measures Alternative Evaluation Summary

The cumulative scoring of the criteria evaluation is summarized below in **Table 10**.

Table 10. Cumulative Criteria Evaluation Scoring Summary

40 CFR 257.97 Reference	Alternative 2a	Alternative 3	Alternative 4	Alternative 5
Total Score	37	63.5	50	**69.5**

Further detail regarding the cumulative scoring criteria is provided on Table E-1 in **Appendix E**. Alternative 5 scored highest of all the alternatives during the evaluation.

4. Remedy Selection

In alignment with the scoring completed as part of the corrective measure evaluation (see **Appendix E**), BREC has selected Alternative #5 (CiP, Other Source Control, ICs, and Groundwater Monitoring) as the remedy to address groundwater and non-groundwater impacts at the Unit. A description of each corrective measure technology incorporated into the selected remedy is provided below.

4.1 Closure in Place

In adherence with the BREC's permit conditions, the Site will continue to operate as a solid waste disposal facility through its life cycle and will be closed in accordance with the requirements of the permit. The current life cycle estimates for the Green Landfill predict that the Unit will reach capacity in approximately 2041. Source control through landfill closure will include installation of final cover that will prevent infiltration and contribute to groundwater quality restoration.

4.2 Source Control

To comply with the Agreed Order signed by BREC and KDWM for the Unit, additional source control measures will be implemented in 2020 and 2021 to reduce/eliminate the downward migration of COC into groundwater. As currently planned, theses measure will include the following:

- Landfill perimeter collection trenches; and
- Removal of CCR material from the South Sediment Basin.

Interim corrective measures for the perimeter seeps are being planned in a phased approach. The first step is to divert the seepage to the Northeast Sediment Basin which is routed to the KPDES outfall of the Green Surface Impoundment. Removing the seeps from stormwater channels will prevent mixing with impounded stormwater. The use of the South Sediment Basin requires that CCR materials be removed so that the seepage does not have the potential to impact groundwater. Corrective measures for the South Sediment Basin will involve the removal of any residual CCR material and creation of two lined sump areas, one on the east end to collect the South and East perimeter seeps and one on the west end to collect Southwest corner perimeter seeps. Additionally, perimeter seeps on the north side of the landfill will be similarly controlled but will be directly routed to the collector sump on the north side of the landfill.

Design of the additional source control remedies is currently being performed by BREC. A draft design package will be provided to KDWM as part of a separate submittal to comply with the conditions of Agreed Order #18-3-0138. The implementation schedule for source control measures is discussed in Section 5.

4.3 Institutional Controls

The use of ICs (i.e., Environmental Covenant, groundwater use restrictions, etc.) is retained as a useful technology. However, it is noted the ICs are not anticipated to be used as a stand-alone technology. Environmental Covenants, groundwater use restrictions, etc., are expected to be combined with other applicable technologies as part of the remedy for the Unit.

4.4 Groundwater Monitoring

Assessment monitoring is expected to continue at the Unit until the CAOs have been met.

5. Remedy Implementation Schedule

5.1 Schedule Evaluation Factors

The schedule for remedy implementation is provided in **Appendix F**. 40 CFR Part 257.97(d) outlines the factors that must be considered in specifying a schedule to remedial implementation at a CCR unit as follows.

1) Extent and nature of contamination, as determined by the characterization required under § 257.95(g);
2) Reasonable probabilities of remedial technologies in achieving compliance with the groundwater protection standards established under § 257.95(h) and other objectives of the remedy;
3) Availability of treatment or disposal capacity for CCR managed during implementation of the remedy;
4) Potential risks to human health and the environment from exposure to contamination prior to completion of the remedy;
5) Resource value of the aquifer including:
    i. Current and future uses;
    ii. Proximity and withdraw rate of users;
    iii. Groundwater quantity and quality;
    iv. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to CCR constituents;
    v. The hydrogeologic characteristic of the facility and surrounding land;
    vi. The availability of alternative water supplies; and
6) Other relevant factors.

Each of these factors was consider by BREC as part of the remedy selection process as described below.

5.1.1 Nature and Extent of Contamination

The data obtained during characterization monitoring performed at the Unit under 40 CFR Part 257.95(g) indicates that the extent of groundwater and non-groundwater impacts is confined to Sebree Station. Source control measures implemented to date will ensure that non-groundwater releases are captured and will not migrate beyond the functional perimeter of the Unit and the property controlled by BREC.

Assessment monitoring will continue at the Unit to confirm that the nature and extent of contamination is defined and progressing in accordance with the CAOs.

5.1.2 Compliance Probability

Implementation of the selected remedy is expected to have a high probability of meeting the CAOs. There is firm evidence of a relatively direct connection between infiltration of co-mingled leachate and stormwater at the South Sediment Basin and the observed impact to monitoring wells MW-4, -5, and -6. Consequently, removal of that infiltration by the planned corrective measures (excavating CCR from the South Sediment Basin and containing leachate in a series of sumps and piped conveyance) is expected to have a direct influence on groundwater quality. The time required to achieve GWPSs at the affected wells has not been modeled but is expected to be on the order of one to five years if the remedy is implemented as planned.

Impacts observed at MW-3A may be tied to the nearby non-groundwater release captured by the Deep Seep Collection Trench, in which case, the time to achieve CAOs may be relatively quick now that the

seepage is being hydraulically controlled. However, there are unknowns regarding the nature of how lithium is transported to that well location. Those uncertainties cannot be evaluated given the physical constraints of the site (proximity of the landfill to the river), so the time frame required to meet CAOs cannot be predicted until additional Assessment monitoring data are available.

5.1.3 CCR Treatment and Disposal Capacity

Wastes generated by the groundwater corrective measures activities will include residual CCR content removed from the South Sediment Basin and seepage collected from the perimeter seepage controls. Wastes generated by the non-groundwater corrective measures activities will be seepage collected from the Deep Seep Collection Trench and the Northwest Seep Collection Trench.

The solids (dredged material from the South Sediment Basin) will be interred in the Landfill as allowed under the existing solid waste permit. The Landfill has sufficient capacity for this one-time waste stream volume. The liquid wastes will be managed under the KPDES permit for the station.

5.1.4 Exposure Risk

As detailed in Section 2.3.8, there is no data to suggest that human health and the environment are currently being exposed to COC emanating from the Unit. This condition is not expected to change prior to implementation of the remedy but will continue to be evaluated through Assessment monitoring and systematic performance reviews.

5.1.5 Aquifer Resource Value

Based on data published by KGS, there are no known groundwater wells used for drinking water within a 1-mile radius of the Unit. This is not expected to change in the future but will be re-examined during future performance reviews. Therefore, the significance of aquifer resource value is not considered pertinent to this evaluation or the resulting schedule.

5.1.6 Other Relevant Factors

Within Exhibit 4 of the Agreed Order, a milestone schedule was provided for groundwater corrective action. Although the milestone schedule has been adjusted due to the work conditions imposed by the COVID-19 pandemic, which includes holding the public meeting at an earlier date, BREC has moved forward with the activities required in the Agreed Order.

5.2 Performance Review

Source control measures are viewed as the remedial component likely to have the most significant short- and long-term benefit on reducing groundwater and non-groundwater impacts at the Unit. As such, evaluating the performance of source control measures constructed at the Unit should be evaluated through systematic review.

Although not specifically mandated under the CCR Rule, five-year reviews are generally required by the regulatory agency under corrective action programs (i.e. CERCLA) when hazardous substances remain at a site above levels that permit unlimited use and unrestricted exposure. Five-year reviews provide an opportunity to evaluate the implementation and performance of a remedy to determine whether it remains protective of human health and the environment. Generally, reviews take place five years following the start of corrective action and are repeated every succeeding five years so long as future uses remain restricted. BREC will perform a five-year review to evaluate compliance with the CAOs and evaluate the effectiveness of the remedy selected for the Unit five years after construction completion (approximately 2026).

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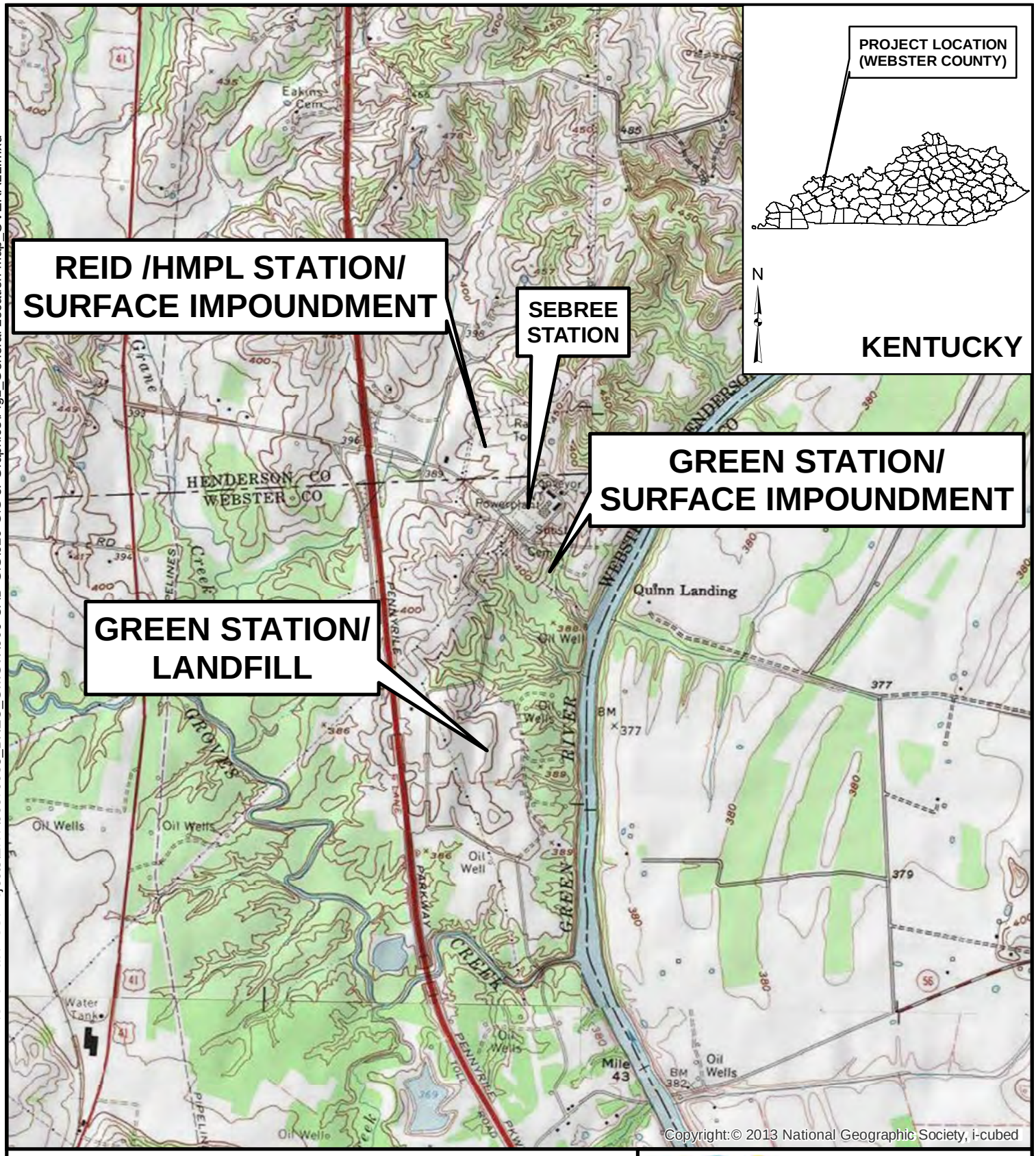
Figures



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UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ROBARDS QUADRANGLE
DELAWARE QUADRANGLE
(FROM ARCGIS ONLINE Copyright:© 2011 National Geographic Society, i-cubed)

0 2,000 4,000 Feet

N

Big Rivers ELECTRIC CORPORATION

Sebree Station
Webster County, Kentucky

FIGURE 1
GENERAL LOCATION MAP

DATE: 1/8/2019	SCALE: 1IN = 2,000 FEET
CREATED BY: ALW	
JOB NO. 60579938	

RS 04
MW-12
GNWSB-1
GNWSB-3
GNWSB-2
N
N′
B
B′
MW-1
A′
MW-2
GESB-01
GESB-02
LS 02
GESB-03
GESB-04
GESB-05
GESB-06
GESB-07
GESB-08
GESB-09
GESB-10
GESB-11
GESB-12
GESB-13
GESB-14
GESB-15
GESB-16
GESB-17
RS 05
RS 06
Green River
GESB-18
GESB-19
RS 07
GESB-20
GESB-21
GESB-22
MW-3A
GESB-23
LS 01
GESB-24
GESB-25
MW-104
GESB-26
LS 04
GESB-27
LS 03
GESB-28
GESB-29
C
MW-6
RS 08
C′
MW-5
A
MW-4
Groves Creek
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Characterization Well
- A — A' Transect Line
- GESB-01 Seeps Investigation Borings
- Landfill Seep Sample
- River Seep Sample

0 400 800
Feet

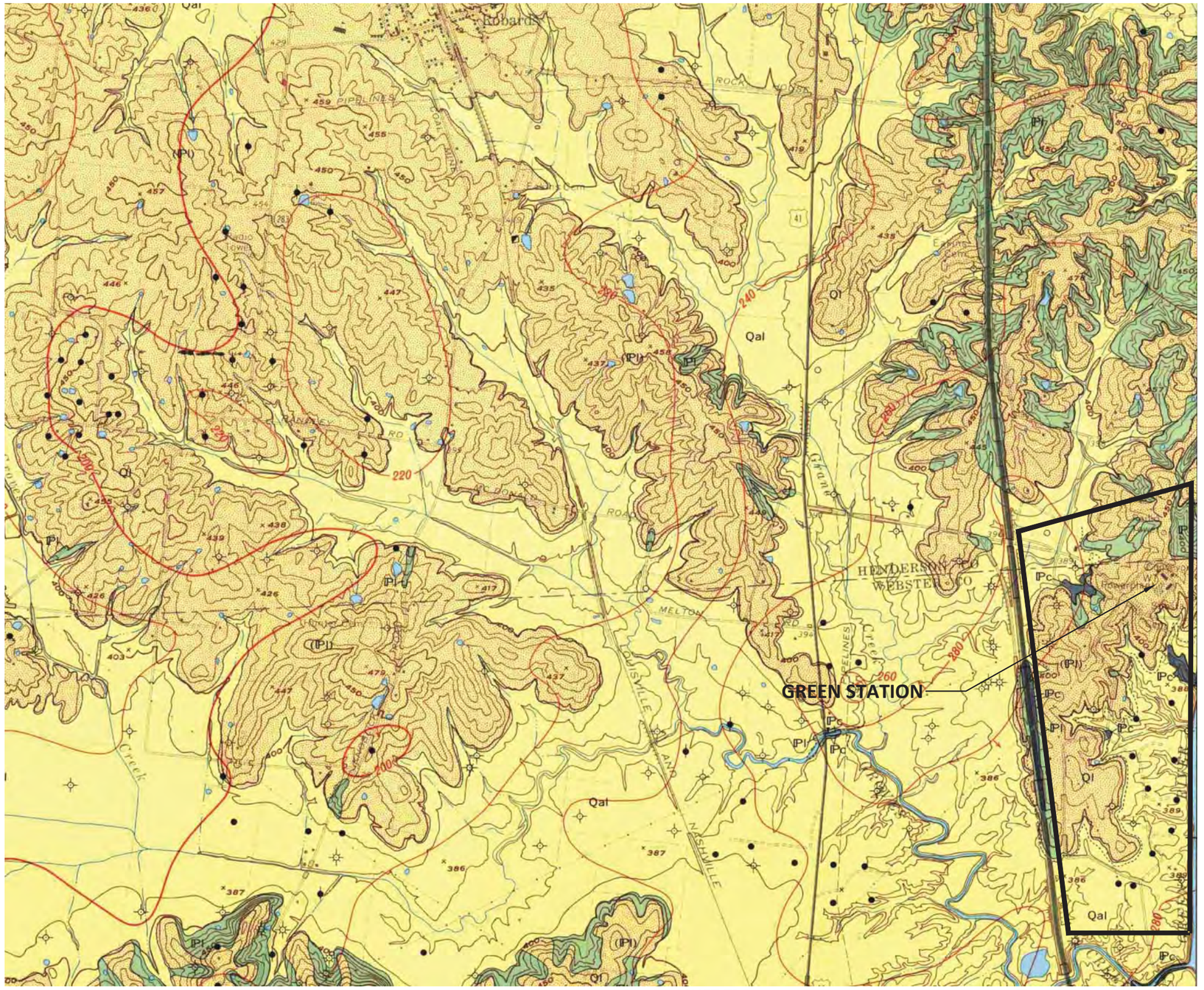
N

Big Rivers

Green Station
Webster County, Kentucky

FIGURE 2
WELL LOCATION MAP

DATE:06/04/2019	SCALE: 1IN = 300 FEET
CREATED BY: DAS	
JOB NO. 60602364	



SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

DATUM IS MEAN SEA LEVEL

EXPLANATION

Pleistocene and Holocene	Qal — Alluvium	QUATERNARY
Pleistocene	Ql — Loess *Adapted in part from soil map of Henderson County (Converse and Cox, 1967)*	QUATERNARY
Upper Pennsylvanian	(Pl) / m / Pl — Lisman Formation m, *base of Madisonville Limestone Member*	PENNSYLVANIAN
Middle Pennsylvanian	Pc — Carbondale Formation	PENNSYLVANIAN

Formation symbols enclosed in parentheses where units concealed by mapped surficial deposits

Contact or key bed

Dashed where inferred; dotted where concealed. Triangles indicate selected localities where contacts were well exposed at time of mapping

Strike and dip of beds

200

Structure contours

Drawn on base of No. 9 coal bed; projected where contoured horizon is missing. Arrows indicate direction of dip. Contour interval 20 feet

Outline of area where No. 9 coal bed is missing

DRILL HOLES FROM WHICH SUBSURFACE STRUCTURAL DATA WERE OBTAINED, AS OF JANUARY 1, 1971

Dry hole

Oil well

Big Rivers Electric Corporation

Green Station
Webster County, Kentucky

FIGURE 3
SITE GEOLOGIC MAP
(KENTUCKY GEOLOGICAL SURVEY)

DATE: 05/21/2019	SCALE: AS SHOWN
CREATED BY: DAS	
JOB NO. 60602364	

S
A

N
A'

South Pond Extent

Historical "Bottom Ash" Pond Extent

MW-4* GESB-29 P-3* GESB-28 B-8* GESB-27 GESB-26 GESB-25 MW-104 GESB-24 GESB-23 B-6 B-5* MW-3A* GESB-22 GESB-21 GESB-20 GESB-19 P-6* Sump A Sump B GESB-18 B-4 GESB-17 GESB-16 GESB-15 GESB-14 GESB-13 GESB-12 GESB-11 Sump C GESB-09 Sump D GESB-08 GESB-07 GESB-06 GESB-05 GESB-04 GESB-03 GESB-02 GESB-01 MW-2 B-2* P-9

AVERAGE ROAD LEVEL

08 07 06 05

FEET, MSL

430 420 410 400 390 380 370 360 350 340 330 320 310

0 500 1000 1500 2000 2500 3000 3500

FEET

(Vertical Exaggeration = 20x)

Bedrock Lithologies:

- Sandstone
- Shale
- Interbedded Sandstone and Shale
- Interbedded Shale and Sandstone

Unconsolidated Materials:

- Silty Clay
- Fill

- Collection Area
- River Seep (projected) (07)
- APROX. RIVER LEVEL
- Sump
- Potentiometric Surface
- 11/11/2019 - 11/12/2019
- Boring (*Projected)
- MW-2 — Well ID
  - Riser
  - Screen

Big Rivers Electric Corporation

Green Station
Webster County, Kentucky

FIGURE 4
CROSS SECTION A - A'
East (River) Side of Ash Pile

DATE: 05/01/2020	SCALE: AS SHOWN
CREATED BY: ALY	JOB NO. 60619283

W
B

E
B′

Fly Ash (Landfill)

Pennyrile Parkway

MW-1
P-7*
B-1*
P-8*
P-9*
B-2*
MW-2*

North Settling Basin

Green River

FEET, MSL

430
420
410
400
390
380
370
360
350
340
330
320
310

0
500
1000
1500
2000
2500
3000
3500

FEET

Bedrock Lithologies:

- Sandstone
- Shale
- Limestone
- Interbedded Sandstone and Shale
- Interbedded Shale and Sandstone

Unconsolidated Materials:

- Silty Clay
- Fill

Potentiometric Surface

11/11/2019 - 11/12/2019

Boring
(*Projected)

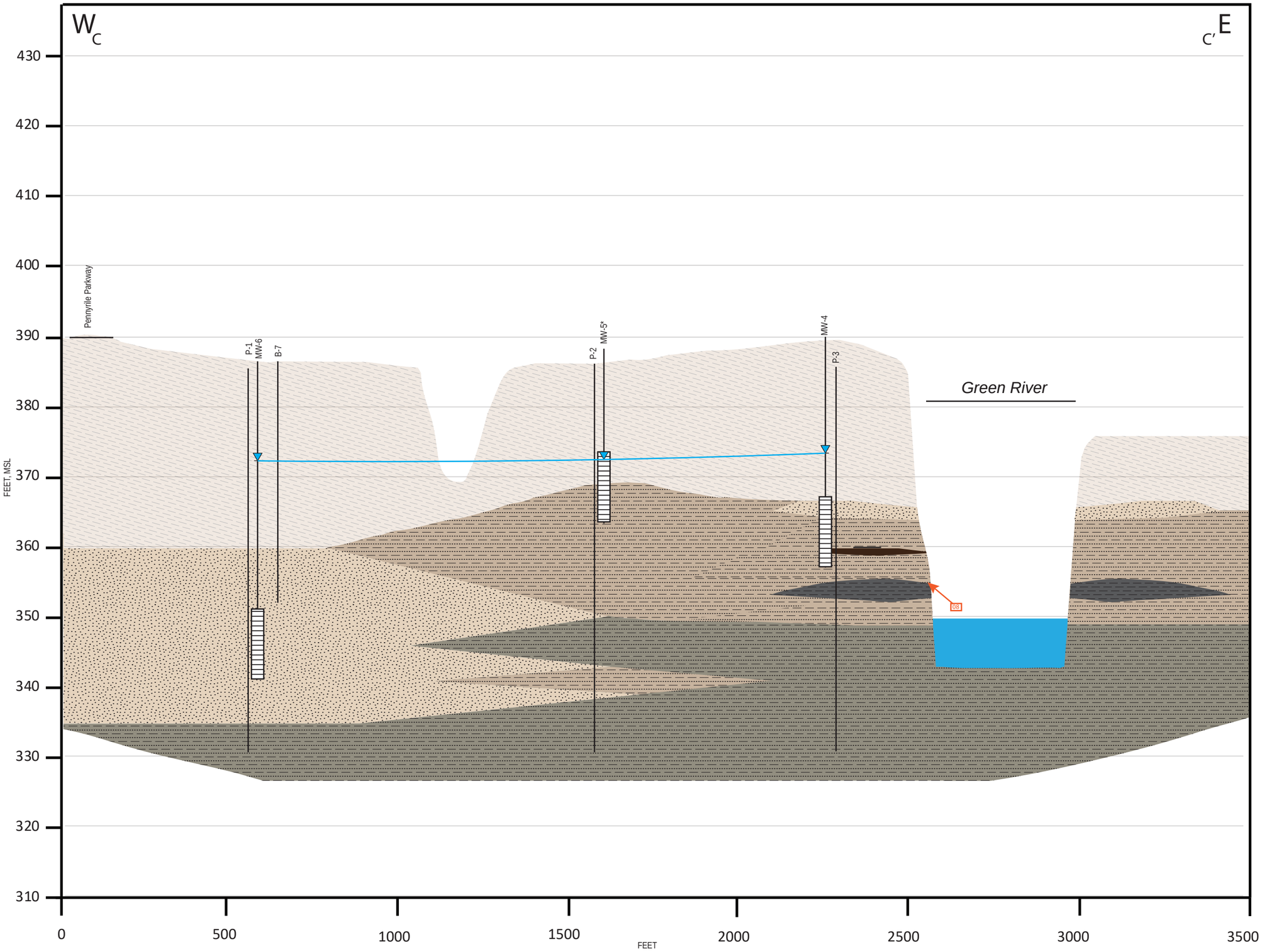
MW-2— Well ID
Riser
Screen

Big Rivers Electric Corporation

Green Station
Webster County, Kentucky

FIGURE 5
CROSS SECTION B - B'
North Side of Ash Pile

DATE: 05/01/2020	SCALE: AS SHOWN
CREATED BY: ALY	JOB NO. 60619283



Bedrock Lithologies:

- Sandstone
- Shale
- Interbedded Sandstone and Shale
- Interbedded Shale and Sandstone

Unconsolidated Materials:

- Silty Clay
- Fill

- River Seep (projected)
- Potentiometric Surface
- 11/11/2019 - 11/12/2019
- Boring (*Projected)
- MW-4 — Well ID
  - Riser
  - Screen

Big Rivers Electric Corporation

Green Station
Webster County, Kentucky

FIGURE 6
CROSS SECTION C - C'
South Side of Ash Pile

DATE: 05/01/2020	SCALE: AS SHOWN
CREATED BY: ALY	JOB NO. 60619283

W
N

E
N'

GNWSB-2*
NWS Collection Sump
GNWSB-1*
RS-1*
RS-2*
GNWSB-3
Manhole*
MW-12
Target Manhole*
Green River

FEET, MSL
430
420
410
400
390
380
370
360
350
340
330
320
310

0
500
1000
1500
2000
2500
3000
3500
FEET

Bedrock Lithologies:

- Sandstone
- Shale
- Limestone
- Interbedded Sandstone and Shale
- Interbedded Shale and Sandstone

Unconsolidated Materials:

- Silty Clay
- Fill

Collection Area
Sump

Boring (*Projected)

MW-12 — Well ID
Riser
Screen

Relay Station

RS-1*
Horizontal Pipe
Transparent Lithology is projected. Perceived dip is a result of localized slumping towards the creek.

* Projected

Big Rivers Electric Corporation

Green Station
Webster County, Kentucky

FIGURE 7
CROSS SECTION N - N'
North Side of Ash Pile

DATE: 05/01/2020	SCALE: AS SHOWN
CREATED BY: ALY	JOB NO. 60619283

MW-1
403.71

MW-12
373.39

MW-2
376.13

MW-3A
374.40

MW-4
373.43

MW-5
372.56

MW-6
372.55

375

380

385

390

395

400

Green River

Groves Creek

bing

Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Water Table Contour (Dashed where Inferred from Available Monitoring Data)
- Groundwater Flow Direction
- 373.43 Groundwater Elevation (Feet, MSL) Measured April 7, 2020
- NM - not measured

0 400 800
Feet

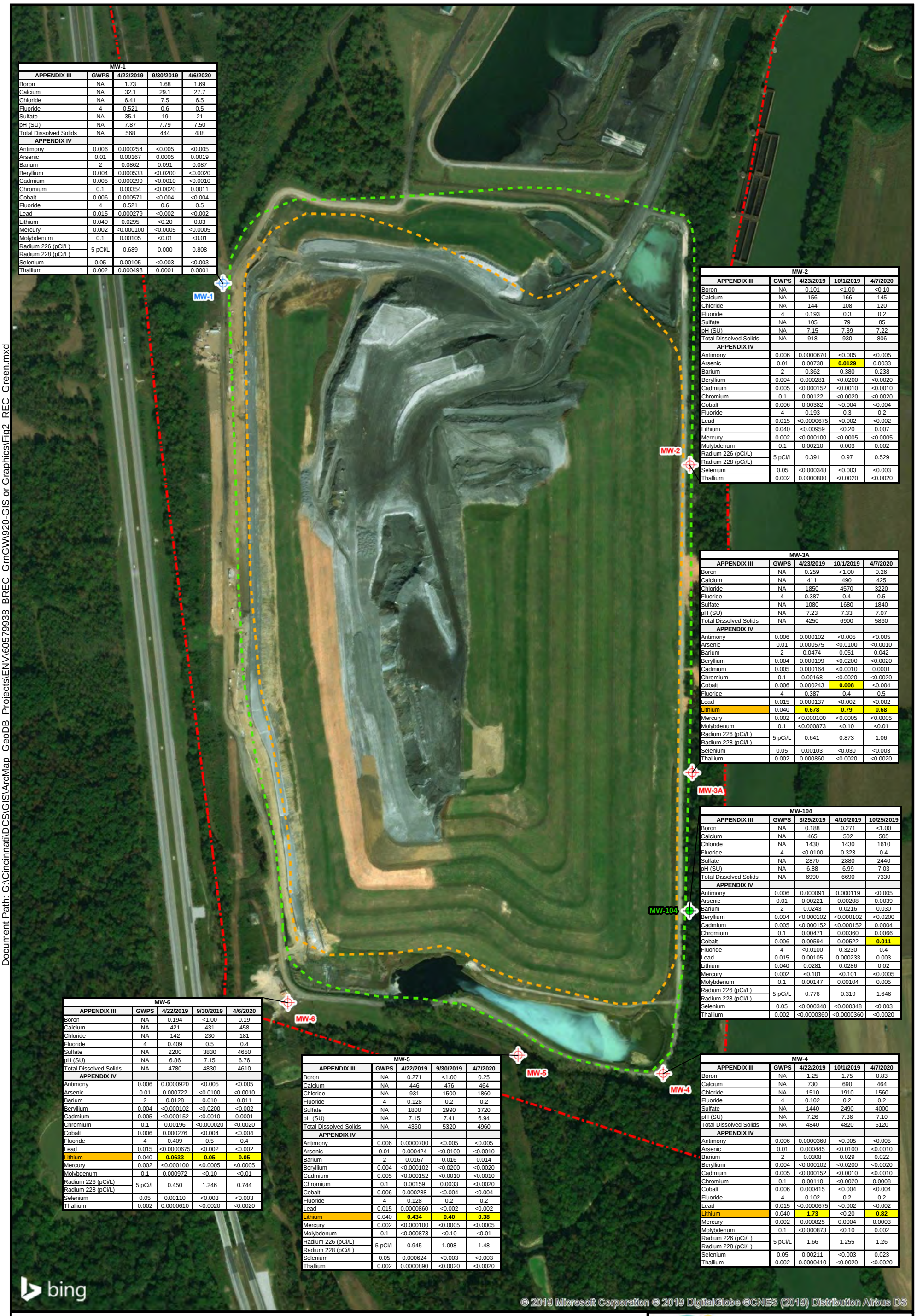
N

Big Rivers Electric Corporation

Green Station Landfill
Webster County, Kentucky

FIGURE 8
POTENTIOMETRIC SURFACE MAP
APRIL 7, 2020

DATE: 4/20/2020	SCALE: 1IN = 400 FEET
CREATED BY: TMJ	
JOB NO. 60579938	



MW-1

APPENDIX III	GWPS	4/22/2019	9/30/2019	4/6/2020
Boron	NA	1.73	1.68	1.69
Calcium	NA	32.1	29.1	27.7
Chloride	NA	6.41	7.5	6.5
Fluoride	4	0.521	0.6	0.5
Sulfate	NA	35.1	19	21
pH (SU)	NA	7.87	7.79	7.50
Total Dissolved Solids	NA	568	444	488
APPENDIX IV				
Antimony	0.006	0.000254	<0.005	<0.005
Arsenic	0.01	0.00167	0.0005	0.0019
Barium	2	0.0862	0.091	0.087
Beryllium	0.004	0.000533	<0.0200	<0.0020
Cadmium	0.005	0.000299	<0.0010	<0.0010
Chromium	0.1	0.00354	<0.0020	0.0011
Cobalt	0.006	0.000571	<0.004	<0.004
Fluoride	4	0.521	0.6	0.5
Lead	0.015	0.000279	<0.002	<0.002
Lithium	0.040	0.0295	<0.20	0.03
Mercury	0.002	<0.000100	<0.0005	<0.0005
Molybdenum	0.1	0.00105	<0.01	<0.01
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.689	0.000	0.808
Selenium	0.05	0.00105	<0.003	<0.003
Thallium	0.002	0.000498	0.0001	0.0001

MW-2

APPENDIX III	GWPS	4/23/2019	10/1/2019	4/7/2020
Boron	NA	0.101	<1.00	<0.10
Calcium	NA	156	166	145
Chloride	NA	144	108	120
Fluoride	4	0.193	0.3	0.2
Sulfate	NA	105	79	85
pH (SU)	NA	7.15	7.39	7.22
Total Dissolved Solids	NA	918	930	806
APPENDIX IV				
Antimony	0.006	0.0000670	<0.005	<0.005
Arsenic	0.01	0.00738	**0.0129**	0.0033
Barium	2	0.362	0.380	0.238
Beryllium	0.004	0.000281	<0.0200	<0.0020
Cadmium	0.005	<0.000152	<0.0010	<0.0010
Chromium	0.1	0.00122	<0.0020	<0.0020
Cobalt	0.006	0.00382	<0.004	<0.004
Fluoride	4	0.193	0.3	0.2
Lead	0.015	<0.0000675	<0.002	<0.002
Lithium	0.040	<0.00959	<0.20	0.007
Mercury	0.002	<0.000100	<0.0005	<0.0005
Molybdenum	0.1	0.00210	0.003	0.002
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.391	0.97	0.529
Selenium	0.05	<0.000348	<0.003	<0.003
Thallium	0.002	0.0000800	<0.0020	<0.0020

MW-3A

APPENDIX III	GWPS	4/23/2019	10/1/2019	4/7/2020
Boron	NA	0.259	<1.00	0.26
Calcium	NA	411	490	425
Chloride	NA	1850	4570	3220
Fluoride	4	0.387	0.4	0.5
Sulfate	NA	1080	1680	1840
pH (SU)	NA	7.23	7.33	7.07
Total Dissolved Solids	NA	4250	6900	5860
APPENDIX IV				
Antimony	0.006	0.000102	<0.005	<0.005
Arsenic	0.01	0.000575	<0.0100	<0.0010
Barium	2	0.0474	0.051	0.042
Beryllium	0.004	0.000199	<0.0200	<0.0020
Cadmium	0.005	0.000164	<0.0010	0.0001
Chromium	0.1	0.00168	<0.0020	<0.0020
Cobalt	0.006	0.000243	**0.008**	<0.004
Fluoride	4	0.387	0.4	0.5
Lead	0.015	0.000137	<0.002	<0.002
Lithium	0.040	**0.678**	**0.79**	**0.68**
Mercury	0.002	<0.000100	<0.0005	<0.0005
Molybdenum	0.1	<0.000873	<0.10	<0.01
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.641	0.873	1.06
Selenium	0.05	0.00103	<0.030	<0.003
Thallium	0.002	0.000860	<0.0020	<0.0020

MW-104

APPENDIX III	GWPS	3/29/2019	4/10/2019	10/25/2019
Boron	NA	0.188	0.271	<1.00
Calcium	NA	465	502	505
Chloride	NA	1430	1430	1610
Fluoride	4	<0.0100	0.323	0.4
Sulfate	NA	2870	2880	2440
pH (SU)	NA	6.88	6.99	7.03
Total Dissolved Solids	NA	6990	6690	7330
APPENDIX IV				
Antimony	0.006	0.000091	0.000119	<0.005
Arsenic	0.01	0.00221	0.00208	0.0039
Barium	2	0.0243	0.0216	0.030
Beryllium	0.004	<0.000102	<0.000102	<0.0200
Cadmium	0.005	<0.000152	<0.000152	0.0004
Chromium	0.1	0.00471	0.00360	0.0066
Cobalt	0.006	0.00594	0.00522	**0.011**
Fluoride	4	<0.0100	0.3230	0.4
Lead	0.015	0.00105	0.000233	0.003
Lithium	0.040	0.0281	0.0286	0.02
Mercury	0.002	<0.101	<0.101	<0.0005
Molybdenum	0.1	0.00147	0.00104	0.005
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.776	0.319	1.646
Selenium	0.05	<0.000348	<0.000348	<0.003
Thallium	0.002	<0.0000360	<0.0000360	<0.0020

MW-6

APPENDIX III	GWPS	4/22/2019	9/30/2019	4/6/2020
Boron	NA	0.194	<1.00	0.19
Calcium	NA	421	431	458
Chloride	NA	142	230	181
Fluoride	4	0.409	0.5	0.4
Sulfate	NA	2200	3830	4650
pH (SU)	NA	6.86	7.15	6.76
Total Dissolved Solids	NA	4780	4830	4610
APPENDIX IV				
Antimony	0.006	0.0000920	<0.005	<0.005
Arsenic	0.01	0.000722	<0.0100	<0.0010
Barium	2	0.0128	0.010	0.011
Beryllium	0.004	<0.000102	<0.0200	<0.002
Cadmium	0.005	<0.000152	<0.0010	0.0001
Chromium	0.1	0.00196	<0.000020	<0.0020
Cobalt	0.006	0.000276	<0.004	<0.004
Fluoride	4	0.409	0.5	0.4
Lead	0.015	<0.0000675	<0.002	<0.002
Lithium	0.040	**0.0633**	**0.05**	**0.05**
Mercury	0.002	<0.000100	<0.0005	<0.0005
Molybdenum	0.1	0.000972	<0.10	<0.01
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.450	1.246	0.744
Selenium	0.05	0.00110	<0.003	<0.003
Thallium	0.002	0.0000610	<0.0020	<0.0020

MW-5

APPENDIX III	GWPS	4/22/2019	9/30/2019	4/7/2020
Boron	NA	0.271	<1.00	0.25
Calcium	NA	446	476	464
Chloride	NA	931	1500	1860
Fluoride	4	0.128	0.2	0.2
Sulfate	NA	1800	2990	3720
pH (SU)	NA	7.15	7.41	6.94
Total Dissolved Solids	NA	4360	5320	4960
APPENDIX IV				
Antimony	0.006	0.0000700	<0.005	<0.005
Arsenic	0.01	0.000424	<0.0100	<0.0010
Barium	2	0.0167	0.016	0.014
Beryllium	0.004	<0.000102	<0.0200	<0.0020
Cadmium	0.005	<0.000152	<0.0010	<0.0010
Chromium	0.1	0.00159	0.0033	<0.0020
Cobalt	0.006	0.000288	<0.004	<0.004
Fluoride	4	0.128	0.2	0.2
Lead	0.015	0.0000860	<0.002	<0.002
Lithium	0.040	**0.434**	**0.40**	**0.38**
Mercury	0.002	<0.000100	<0.0005	<0.0005
Molybdenum	0.1	<0.000873	<0.10	<0.01
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	0.945	1.098	1.48
Selenium	0.05	0.000624	<0.003	<0.003
Thallium	0.002	0.0000890	<0.0020	<0.0020

MW-4

APPENDIX III	GWPS	4/22/2019	10/1/2019	4/7/2020
Boron	NA	1.25	1.75	0.83
Calcium	NA	730	690	464
Chloride	NA	1510	1910	1560
Fluoride	4	0.102	0.2	0.2
Sulfate	NA	1440	2490	4000
pH (SU)	NA	7.26	7.36	7.10
Total Dissolved Solids	NA	4840	4820	5120
APPENDIX IV				
Antimony	0.006	0.0000360	<0.005	<0.005
Arsenic	0.01	0.000445	<0.0100	<0.0010
Barium	2	0.0308	0.029	0.022
Beryllium	0.004	<0.000102	<0.0200	<0.0020
Cadmium	0.005	<0.000152	<0.0010	<0.0010
Chromium	0.1	0.00110	<0.0020	0.0008
Cobalt	0.006	0.000415	<0.004	<0.004
Fluoride	4	0.102	0.2	0.2
Lead	0.015	<0.0000675	<0.002	<0.002
Lithium	0.040	**1.73**	<0.20	**0.82**
Mercury	0.002	0.000825	0.0004	0.0003
Molybdenum	0.1	<0.000873	<0.10	0.002
Radium 226 (pCi/L) + Radium 228 (pCi/L)	5 pCi/L	1.66	1.255	1.26
Selenium	0.05	0.00211	<0.003	0.023
Thallium	0.002	0.0000410	<0.0020	<0.0020

Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Characterization Well

All results listed in milligrams per liter (mg/L) unless otherwise noted.
Yellow highlighted values indicate GWPS exceedance.
Orange highlighted analyte indicate SSL above GWPS.
SSL = Statistically Significant Level
GWPS = Groundwater Protection Standard
NA = Not Applicable
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter

N

0 400 800
Feet

Big Rivers Electric Corporation

Green Landfill
Webster County, Kentucky

FIGURE 9.
GROUNDWATER CONDITIONS MAP
2019-2020 ANALYTICAL RESULTS

DATE: 5/13/2020	SCALE: 1IN = 300 FEET
CREATED BY: SEL	
JOB NO. 60619283	

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Document Path: G:\Cincinnati\DCS\GIS\ArcMap_GeoDB_Projects\ENV\60579938_BREC_GrnGW\920-GIS or Graphics\Fig2_REC_Green.mxd

MW-1
MW-2
MW-3A
MW-104
MW-6
MW-5
MW-4
Green River
Groves Creek
bing
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Legend

- Property Line
- KAR Permit Area
- CCR Fill Area
- Downgradient CCR Monitoring Well
- Upgradient CCR Monitoring Well
- Characterization Well
- Northwest Seep Collection Trench
- Deep Seep Collection Trench

0 400 800
Feet

N

Big Rivers Electric Corporation

Green Landfill
Webster County, Kentucky

FIGURE 10
SEEP COLLECTION TRENCH
LOCATION MAP

DATE: 05/14/2020	SCALE: 1IN = 300 FEET
CREATED BY: SEL	
JOB NO. 60626688	

Appendix A
July 2018 River and Seep Sampling and Analysis Data

TABLE 1

CCR ANALYTICAL SUMMARY
RIVER SEEP AND RIVER SAMPLE EVALUATION

JULY 2018

BIG RIVERS ELECTRIC CORPORATION
GREEN STATION LANDFILL
WEBSTER COUNTY, KENTUCKY

Field Parameters	PRIMARY MCL and CCR LIMITS	Water Quality Criteria (mg/L) Human Health: Domestic Water Supply Source	Human Health: Fish	Warm Water Aquatic Habitat: Acute	Warm Water Aquatic Habitat: Chronic	River Seep-14-71318 Lat 37.661126 Long -87.4894	River Seep-12-71318 Lat 37.61732 Long -87.4936	RiverSeep-16-71318 Lat 37.62167 Long -87.4967	River 01A 71218 Lat 37.64610 Long -87.5059	River 01B 71218 Lat 37.64610 Long -87.5059	RiverSeep-08-71318 Lat 37.62860 Long -87.5003	RiverSeep-07-71218 Lat 37.63299 Long -87.5003	River 02A 71218 Lat 37.63303 Long -87.5002	River 02B 71218 Lat 37.63303 Long -87.5002	RiverSeep-05-71218 Lat 37.63433 Long -87.5003	River 03A 71218 Lat 37.63433 Long -87.5002	River 03B 71218 Lat 37.63433 Long -87.5002	River 04A 71218 Lat 37.63789 Long -87.5004	River 04B 71218 Lat 37.63789 Long -87.5004	River-Seep-04-71218 Lat 37.64122 Long -87.4997
pH (Field Measurement) SU	NA					7.54	7.37	7.46	7.94	7.94	7.09	7.27	7.91	7.91	6.92	7.94	7.94	7.86	7.86	5.13
pH (Lab Measurement) SU	NA					8.14	8.00	8.40	7.64	7.62	8.16	8.01	7.45	7.50	7.95	7.50	7.51	7.52	7.53	5.26
Conductivity (µmhos/cm)	NA					1207	226.2	654	268	268	7674	7715	267.7	267.7	6174	262.2	262.2	265.1	265.1	2545
Temperature (°F)	NA					88.34	84.0	91.58	82.9	82.9	70.52	79.7	84.2	84.2	94.28	84.2	84.2	82.6	82.6	71.6
Oxidation-Reduction Potential (m	NA					-92	-98	-48	131	131	29	-123	98	98	-137	133	133	133	133	125
APPENDIX III CONSTITUENTS																				
Boron	NA					0.0694 J	0.0379 J	0.0321 J	0.0281 J	0.0252 J	0.510 J	1.46	0.0323 J	0.0322 J	0.853 J	0.0251 J	0.0235 J	0.0229 J	0.0234 J	2.19
Calcium	NA					171	21.1	93.8	31.8	33.2	801	1120	32.8	35.8	916	34.8	32.6	32.9	34.5	460
Chloride	NA	250	-	1200	600	22.7	32.7	23.2	4.58 B	4.52 B	2040	1990	6.75 B	6.69 B	1670	5.33 B	5.59 B	4.83 B	4.75 B	189
Fluoride	4 mg/L	4	-	-	-	0.144 J	0.0803 J	0.177 J	0.111 J	0.105 J	0.0915 J	0.102 J	0.0958 J	0.0979 J	0.0795 J	0.100 J	0.0954 J	0.0948 J	0.0945 J	0.239 J F1
Sulfate	NA	250	-	-	-	159 B	16.1 B	26.5 B	28.5	28.3	1440 B	1480 B	30.6	30.1	1170 B	28.8	28.9	28.6	28.6	1310 B
Total Dissolved Solids	NA	250	-	-	-	790	157	504	169	161	5310	6080	173	170	5140	175	170	174	156	2130
APPENDIX IV CONSTITUENTS																				
Antimony	0.006 mg/L	0.0056	0.64	-	-	0.000312 J	0.000499 J	0.000270 J	0.000591 JB	0.000476 JB	0.00141 J	ND	0.00276 B	0.00106 JB	0.000366 J	0.000571 JB	0.000514 JB	0.000504 JB	0.000360 JB	0.000200 J
Arsenic	0.01 mg/L	0.01	-	0.340	0.150	0.0173	0.00467 J	0.0247	0.00124 J	0.00137 J	0.000404 J	0.00182 J	0.00131 J	0.00135 J	0.0192	0.00126 J	0.00131 J	0.00118 J	0.00109 J	0.00188 J
Barium	2 mg/L	1	-	-	-	0.242	0.0757 J	0.190 J	0.0330 J	0.0374 J	0.0443 J	0.0605 J	0.0350 J	0.0396 J	0.718	0.0366 J	0.0362 J	0.0382 J	0.0402 J	0.0384 J
Beryllium	0.004 mg/L	0.004	-	-	-	0.000497 J	0.000145 J	0.000211 J	ND	ND	ND	ND	ND	ND	0.000545 J	ND	ND	ND	ND	0.00372
Cadmium	0.005 mg/L	0.005	-	0.00235	0.00029	0.000312 J	0.000183 J	0.000196 J	ND	ND	ND	ND	ND	ND	0.000563 J	ND	ND	ND	ND	0.00307
Chromium	0.1 mg/L	0.1	-	-	-	0.00969	0.00200 J	0.00383	0.000676 J	0.00143 J	0.000560 J	0.000340 J	0.00111 J	0.00155 J	0.0124	0.00112 J	0.00119 J	0.00134 J	0.00105 J	0.00386
Cobalt	0.006 mg/L					0.0125	0.00581	0.00613	0.000401 J	0.000623 J	0.000691 J	0.0218	0.000730 J	0.000937 J	0.0327	0.000934 J	0.000800 J	0.000841 J	0.000738 J	0.0447
Fluoride	4 mg/L	4	-	-	-	0.144 J	0.0803 J	0.177 J	0.111 J	0.105 J	0.0915 J	0.102 J	0.0958 J	0.0979 J	0.0795 J	0.100 J	0.0954 J	0.0948 J	0.0945 J	0.239 J F1
Lead	0.015 mg/L	0.015	-	0.092	0.0036	0.0109	0.00221 J	0.00521	0.000994 JB	0.00600 B	0.000769 J	0.000523 J	0.00125 JB	0.00199 JB	0.0104	0.00115 JB	0.00166 JB	0.00141 JB	0.00147 JB	0.00507
Lithium	0.040 mg/L					0.0126 J	ND	ND	ND	ND	1.80	0.772	ND	ND	0.340	ND	ND	ND	ND	0.0209 J
Mercury	0.002 mg/L	0.002	0.000051	0.0014	0.00077	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Molybdenum	0.1 mg/L					0.00550 J	0.000948 J	0.00878 J	0.00217 J	0.00130 J	0.00296 J	0.00219 J	0.00222 J	0.00145 J	0.00442 J	0.00105 J	0.00103 J	0.00101 J	0.000981 J	ND
Radium 226 / Radium 228	5 pCi/L	5 pCi/L				NS	1.17	NS	0.417	0.249 U	1.31	1.4	0.554	0.735	7.64	0.404 U	0.391 U	0.544	0.423 U	1.48
Selenium	0.05 mg/L	0.17	4.2	-	0.005	0.000582 J	ND	0.000906 J	ND	ND F2	ND	ND	0.000423 J	0.000636 J	0.00121 J	ND	ND	0.000402 J	ND	0.00216 J
Thallium	0.002 mg/L	0.00024	0.00047	-	-	0.000126 J	ND	ND	0.0000500 J	ND	ND	ND	ND	ND	0.000164 J	ND	ND	ND	ND	ND
IONIC CONSTITUENTS																				
Total Alkalinity	NA					443	38.2	393	85.6	85.6	174	87.7	85.7	85.8	229	86.1	86.4	80.9	85.8	ND
Hardness (as mg/L of CaCO3)**	NA					578	74	318	106	110	3198	3010	108	117	2608	115	108	109	114	1411
Magnesium	NA					36.6	5.20	20.3	6.41	6.62	291	51.8	6.32	6.76	77.8	6.87	6.41	6.45	6.73	63.6
Potassium	NA					4.96	2.37	4.85	2.68	2.91	125	262	3.01	3.65	285	3.06	2.87	2.85	2.95	9.51
Sodium	NA					18.5	5.52	26.7	3.79	3.95	274	277	3.98	4.63	285	4.64	4.01	3.87	4.02	42.1

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
NA = Not available
pCi/L = picoCuries per Liter
SU = Standards units
µmhos/cm = microSiems per centimeter
°F = Degrees Fahrenheit
mV = millivolts
ND = Not detected above the 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.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
NM = Not measured
U = Result is less than the sample detection limit

Note: River "A" samples collected from surface
River "B" samples collected <1 foot above river bed

** The water hardness is using American degree equivalent to mg/L.
Water hardness(mg/L) = Ca(mg/L)×2.497 + Mg(mg/L)×4.118

Constituent	KY Acute Warm Water Habitat Equation	Hardness (mg/L $CaCO_3$)	Hardness** (mg/L $CaCO_3$)
		50	110
		Criterion (ug/L)	Criterion (ug/L)
Cadmium	Criterion = e(1.0166 (ln Hard*)-3.924)	1.05	2.35
Lead	Criterion = e(1.273 (ln Hard*)-1.460)	34	92

Constituent	KY Chronic Warm Water Habitat Equation	Hardness (mg/L $CaCO_3$)	Hardness** (mg/L $CaCO_3$)
		50	110
		Criterion (ug/L)	Criterion (ug/L)
Cadmium	Criterion = e(0.7409 (ln Hard*)-4.719)	0.16	0.29
Lead	Criterion = e(1.273 (ln Hard*)-4.705)	1.3	3.6

*Hard = Hardness as mg/L $CaCO_3$ **Average hardness concentration from collected River Samples (7/12/18)

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Legend

- Pond Sample
- River Seep Sample
- River Sample
- Downgradient Monitoring Well
- Upgradient Monitoring Well

0 1,450 2,900

Feet

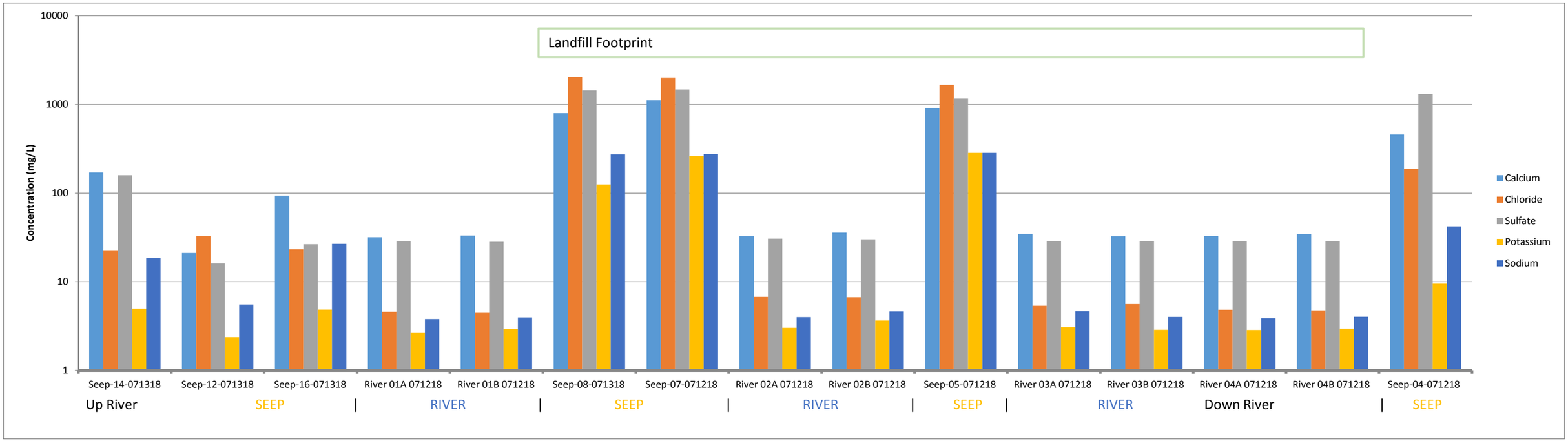
N

Big Rivers Electric Corporation

Green Station Landfill
Webster County, Kentucky

FIGURE 1
RIVER AND SEEP
SAMPLING LOCATIONS

DATE: 9/6/2018	SCALE: 1IN = 1800 FEET
CREATED BY: MRH	
JOB NO. 60579938	



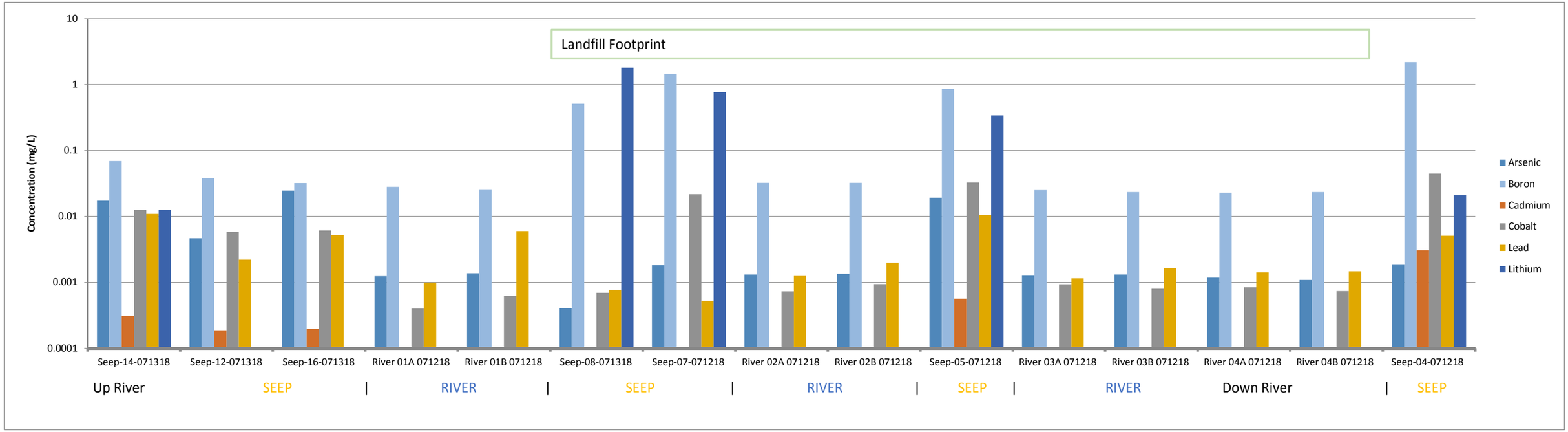


FIGURE 2
CCR ANALYTICAL SUMMARY - GREEN STATION LANDFILL
RIVER SEEP AND RIVER SAMPLE EVALUATION, JULY 2018

8/30/2018

Appendix B
Green Landfill Analytical Summary Tables

GREEN LANDFILL ANALYTICAL SUMMARY TABLES

GREEN LANDFILL - CCR ANALYTICAL SUMMARY
MW-1

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																									
			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		9/28/2018		4/22/2019		9/30/2019	
			Baseline Events																		Assessment		Re-Sampling		Assessment				
Boron	0.08		1.67		1.49		2.25		1.70		1.71	J	1.68		1.85	B	1.79		1.92				1.41		1.94	B	1.73	B	1.68	D2 M4
Calcium	0.5		29.1		31.8	B	33.0		30.9		20.8		28.1		27.1		29.9	B	26.4				26.5		28.5	B	32.1		29.1	D2
Chloride	3		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			6.34	B	6.17	B	6.41	B F1	7.5	
Fluoride	1		ND	J	ND	JB	ND	J	ND	JB	ND	J F1	ND	JB	ND	J F1	ND	J	ND	J F1			ND	J	ND	JB	0.521	J	0.6	
Sulfate	5		25.2		22.8	JB	22.9		20.7	B	28.4		24.0	B	25.3	B	23.4		24.9	JB			23.5		22.5	B	35.1	B F1	19	
pH (SU)	0.10		7.39		7.24		7.57		7.19		7.63		7.54		7.45		7.48		7.63				7.08		8.43		7.87		7.79	H3
Total Dissolved Solids	10		598		588		585		585		605		630		614		627		636				585		616		568	B	444	H1
APPENDIX IV CONSTITUENTS																														
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	B	ND		ND		ND	JB	0.00297	B	ND	JB			ND	JB	ND	J	NA		0.000254	JB	ND	M1 V1 U
Arsenic	0.005	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	ND	JB	0.00167	JB	0.0005	V1 J
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J F1	ND	J			ND	JB	ND	J	ND	J	0.0862	J	0.091	D2
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000533	J	ND	D2 U
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000299	J	ND	VI U
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND		NA		0.00354	B	ND	U
Cobalt	0.005	0.006 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J	NA		0.000571	J	ND	U
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J F1	ND	JB	ND	J F1	ND	J			ND	J	ND	J	ND	JB	0.521	J	0.6	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND	J	ND		ND		ND		ND		ND	J			ND		ND	J	NA		0.000279	J	ND	V1 U
Lithium	0.05	0.040 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	0.0279	J	0.0295	J	ND	D2 M3 U
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U
Molybdenum	0.01	0.1 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND				ND	J	ND	J	NA		0.00105	J	ND	U
Radium 226	1	5 pCi/L	1.05		1.02		0.676		1.02		0.694		0.666		0.491		0.601				1.92		0.882		0.905		0.689		0.782	
Radium 228																													0.733	
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND	J	ND				ND		ND		NA		0.00105	J	ND	U
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND	J	ND		ND		ND	J	ND				ND		ND		NA		0.000498	J	0.0001	V1 J

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
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-2

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/28/2018		4/23/2019		10/1/2019	
			Baseline Events																		Assessment		Re-Sampling		Assessment			
Boron	0.08		ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	0.113	JB	ND	JB	ND	J			ND	J	0.0630	JB	0.101	JB	ND	D2 U
Calcium	0.5		119		116	B	140		140	B	126		152		154		121		150				155		165	B	156		166	D1
Chloride	3		126	B	125	B	129	B	133		142	B	129	B	145	B	136	B	129	B			154	B	159	B	144		108	D
Fluoride	1		ND	J	ND		ND	J	ND	JB F1	ND	J	ND	JB	ND	JB	ND	JB F1	ND	J			ND	J	ND	JB	0.193	J	0.3	
Sulfate	5		80.0		84.5	J	85.5	J	90.1		89.8		83.2		92.0	JB	90.8		88.6	JB			107		108	B	105		79.0	D
pH (SU)	0.10		6.81		6.59		6.7		6.78		7.12		7.04		6.77		6.69		6.86		6.64		6.40		7.02		7.15		7.39	H3
Total Dissolved Solids	10		764		780		830		880		862		918		913		818		970				884		937		918	B	930	H1
APPENDIX IV CONSTITUENTS																														
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND	JB	ND		ND	JB	ND	B	ND	JB			ND	JB	ND	J	NA		0.0000670	JB	ND	V1 U
Arsenic	0.005	0.01 mg/L	0.00703	J	0.00633		0.0110		0.0159		0.0462		0.00755		0.0381		0.00527				0.0327	B	0.0119		0.0211	B	0.00738	B	0.0129	D2
Barium	0.2	2 mg/L	ND	J	ND	J	0.280		0.319		0.347		0.332		0.308		ND	J			0.369		0.323		0.367		0.362		0.380	D2
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000281	J	ND	D2 U
Cadmium	0.001	0.005 mg/L	ND	J	ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND		NA		0.00122	JB	ND	D2 U
Cobalt	0.005	0.006 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J			ND	JB	ND	J	NA		0.00382	J	ND	D2 U
Fluoride	1	4 mg/L	ND	J	ND		ND	J	ND	JB F1	ND	J	ND	JB	ND	JB	ND	JB F1			ND	J	ND	J	ND	JB	0.193	J	0.3	
Lead	0.005	0.015 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U
Lithium	0.05	0.040 mg/L	ND	J	ND		ND		ND		ND	J	ND	J	ND	JB	ND				ND		ND		ND		ND		ND	D2 VI U
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	JB			ND	J	ND	J	NA		0.00210	J	0.003	J
Radium 226	1	5 pCi/L	0.533		ND		0.46		ND		0.856		0.73		0.968		0.537				1.18		0.733		0.803		0.391		0.136	
Radium 228																													0.834	
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND	JB	ND		ND		ND	JB	ND				ND		ND		NA		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		0.0000800	J	ND	V1 U

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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
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	Detection Limit	GWPS	DATE																					
			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		9/28/2018		4/23/2019		10/1/2019	
			Baseline Events																		Assessment		Re-Sampling		Assessment			
Boron	0.08		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				0.177	J	0.257	JB	0.259	JB	ND	D2 U
Calcium	0.5		431		322	B	362		365	B	327		420		421		438	B	408				469		447	B	411		490	D1
Chloride	3		2630	HB	3070		2150	B	2150	B	2220	B	2120	B	1790	B	2270	B	1870	B			2180	B	2040	B	1850		4570	D
Fluoride	1		ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		3.16		ND	J			ND	J	ND	JB	0.387	J	0.4	
Sulfate	5		1330		1330		1190		1660		1080		1030	B	942		1130		1030	B			1010		1130	B	1080		1680	D
pH (SU)	0.10		6.92		6.86		6.95		6.75		7.17		7.11		6.81		6.9		6.95		6.84		6.55		7.98		7.23		7.33	H3
Total Dissolved Solids	10		4440		5010		4170		4450		4270		5170		5010		5020		5300				4540		4940		4250	B	6900	H1
APPENDIX IV CONSTITUENTS																														
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.000102	JB	ND	V1 U
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000575	JB	ND	D2 U
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.0474	J	0.051	D2 U
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000199	J	ND	D2 U
Cadmium	0.001	0.005 mg/L	ND	J	ND	J	ND		ND		ND	J	ND	J	ND		ND				ND	J	ND	J	NA		0.000164	J	ND	V1 U
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND		NA		0.00168	JB	ND	D2 U
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J	NA		0.000243	J	0.008	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		3.16				ND	J	ND	J	ND	JB	0.387	J	0.4	
Lead	0.005	0.015 mg/L	ND	J	ND		ND		ND		ND		ND		ND	J	ND	J			ND		ND	J	NA		0.000137	J	ND	V1 U
Lithium	0.05	0.040 mg/L	0.669		0.516		0.648		0.677		0.689		0.746		0.767		0.762				0.699		0.790		0.766		0.678		0.79	D1
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U
Molybdenum	0.01	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U
Radium 226	1	5 pCi/L	1.38		0.386		0.472		1.15		1.15		0.923		1.53		1.03				1.18		1.43		1.21		0.641		0.139	
Radium 228																													0.734	
Selenium	0.01	0.05 mg/L	ND		ND		ND	J	ND	JB	ND		ND		ND		ND				ND	J	ND		NA		0.00103	J	ND	D2 U
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND		ND		NA		0.000860	J	ND	V1 U

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H1 = Sample analysis performed pasts holding time
H3 = Sample received and analyzed past holding time
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample

GREEN LANDFILL - CCR ANALYTICAL SUMMARY
MW-4

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/28/2018		4/22/2019		10/1/2019	
			Baseline Events																		Assessment		Re-Sampling				Assessment			
Boron	0.08		0.602		0.498	J	1.58		1.7		1.54	B	2.09		2.51	B	2.87	B	1.36				0.751	J	1.33	B	1.25	B	1.75	D2
Calcium	0.5		660		386	B	464		558		591		774		743		739		828				822		722	B	730		690	D1
Chloride	3		1450	B	939	B	952	B	1000	B	1420	B	1320	B	1360	B	1880	B	1730	B			1430	B	1310	B	1510		1910	D
Fluoride	1		ND	J	ND		ND	J	ND	JB	ND	J	1.06	B	ND		ND	JB	ND	J			ND	J	ND	JB	0.102	J	0.2	
Sulfate	5		1830		1640		1420		1420	B	1620		1430	B	1600	B	2020		1590	B			1460		1400	B	1440		2490	D
pH (SU)	0.10		6.36		6.83		7.08		6.61		7.28		7.1		6.84		6.64		6.93		6.86		6.58		8.06		7.26		7.36	H3
Total Dissolved Solids	10		3700		4250		3440		3250		4420		4550		4890		4700	H	6220				4880		5170		4840	B	4820	H1
APPENDIX IV CONSTITUENTS																														
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND		ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.0000360	JB	ND	V1 U
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND		ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000445	JB	ND	D2 U
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	J	ND	JB			ND	J	ND	J	ND	J	0.0308	JB	0.029	D2 J
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U
Cadmium	0.001	0.005 mg/L	ND	J	ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND		NA		0.00110	JB	ND	D2 U
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND	J	NA		0.000415	J	ND	U
Fluoride	1	4 mg/L	ND		ND		ND	J	ND	JB	ND	J	ND	B	ND		ND	JB			ND	J	ND	J	ND	JB	0.102	J	0.2	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U
Lithium	0.05	0.040 mg/L	1.39		0.838		1.13		1.25		1.35		1.59		1.77		1.66				1.81		1.91		1.81		1.73		ND	D2 V1 U
Mercury	0.0002	0.002 mg/L	0.00027		0.000224		ND	J	0.000248		0.000302		0.000717		0.000825		0.000485				0.000824		0.000832		0.000680		0.000825		0.0004	V1 J
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND		ND		ND	J	ND		ND		ND				ND		ND		NA		ND		ND	D2 U
Radium 226	1	5 pCi/L	1.26		0.592		ND		0.536		1.22		1.43		1.94		1.19				1.62		2.00		1.51		1.66		0.451	
Radium 228																													0.804	
Selenium	0.01	0.05 mg/L	ND	J	ND	J	ND	J	ND		ND	J	ND		ND		ND	J			ND	J	ND		NA		0.00211	J	ND	U
Thallium	0.001	0.002 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		ND		NA		0.0000410	J	ND	V1 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-5

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																			
			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	9/28/2018	4/22/2019	9/30/2019
			Baseline Events									Assessment	Re-Sampling	Assessment		
Boron	0.08		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		0.207 J	0.263 JB	0.271 JB	ND D2 U
Calcium	0.5		452	189 B	374	399	335	464	423	407 B	383		469	441 B	446	476 D1
Chloride	3		1630 B	521	688 B	755 B	734 B	722 B	945 B	779 B	608 B		941 B	1140 B	931	1500 D
Fluoride	1		ND J	ND	ND J	ND	ND J	ND JB	ND	3.69	ND J		ND J	ND JB	0.128 J	0.2
Sulfate	5		1760 HB	876	1780	1740 B	1880	1760 B	2060 B	1920	1600 B		1800	1890 B	1800	2990 D
pH (SU)	0.10		6.76	6.74	6.99	6.61	7.14	7.44	6.87	7.13	7.06	6.88	6.40	7.99	7.15	7.41 H3
Total Dissolved Solids	10		4210	1660	3470	3610	3680	4250	4130	4120	4390		4100	4540	4360 B	5320 H1
APPENDIX IV CONSTITUENTS																
Antimony	0.002	0.006 mg/L	ND	ND J	ND JB	ND	ND	ND JB	ND JB	ND JB		ND JB	ND	NA	0.0000700 JB	ND V1 U
Arsenic	0.005	0.01 mg/L	ND	ND J	ND JB	ND J	ND J	ND J	ND J	ND JB		ND JB	ND J	ND JB	0.000424 JB	ND D2 U
Barium	0.2	2 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J	ND J	ND J	0.0167 J	0.016 D2 J
Beryllium	0.002	0.004 mg/L	ND	ND	ND J	ND	ND	ND	ND	ND		ND	ND	NA	ND	ND D2 U
Cadmium	0.001	0.005 mg/L	ND J	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	ND	ND V1 U
Chromimum	0.003	0.1 mg/L	ND	ND J	ND	ND	ND J	ND J	ND	ND J		0.00363 B	ND	NA	0.00159 JB	0.0033
Cobalt	0.005	0.006 mg/L	ND	ND J	ND J	ND J	ND	ND J	ND	ND J		ND JB	ND J	NA	0.000288 J	ND U
Fluoride	1	4 mg/L	ND J	ND	ND J	ND	ND J	ND	ND	3.69		ND J	ND J	ND JB	0.128 J	0.2
Lead	0.005	0.015 mg/L	ND J	ND J	ND	ND	ND	ND	ND	ND		ND J	ND J	NA	0.0000860 J	ND V1 U
Lithium	0.05	0.040 mg/L	0.521	0.136	0.305	0.325	0.368	0.415	0.405	0.353		0.459	0.481	0.425	0.434	0.40 D1
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	0.00351	ND		ND	ND	ND	ND	ND V1 U
Molybdenum	0.01	0.1 mg/L	ND	ND J	ND	ND	ND	ND	ND	ND		ND	ND	NA	ND	ND D2 U
Radium 226	1	5 pCi/L	1.16	0.736	0.959	0.957	0.765	0.888	1.54	0.773		0.862	1.42	1.37	0.945	0.368
Radium 228																0.730
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND J	ND J	ND	ND		ND J	ND	NA	0.000624 J	ND U
Thallium	0.001	0.002 mg/L	ND	ND	ND J	ND J	ND	ND J	ND	ND J		ND J	ND	NA	0.0000890 J	ND V1 U

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pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
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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
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	Detection Limit	GWPS	DATE																					
			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		6/4/2018		7/10/2018		9/28/2018		4/22/2019		9/30/2019	
			Baseline Events																		Assessment		Re-Sampling				Assessment			
Boron	0.08		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				0.155	J	0.196	JB	0.194	JB	ND	D2 U
Calcium	0.5		467		374	B	373		400		320		415		365		382	B	376				386		356	B	421		431	D1
Chloride	3		167	B	149	B	136	JB	150	B	125	B	129	B	128	B	123	B	138	B			147	B	142	B	142		230	D
Fluoride	1		ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		ND	J	ND	J			ND	J	ND	JB	0.409	J	0.5	
Sulfate	5		2250	HB	3340		2550		2610	B	2700		2600	B	2820	B	2490		2700	B			2120		2420		2200		3830	D
pH (SU)	0.10		6.66		6.65		6.96		6.6		6.92		6.97		6.76		6.95		6.86				6.50		7.94		6.86		7.15	H3
Total Dissolved Solids	10		4060		4280		4350		4470		4720		4700		4830		4890		4910				4500		4820		4780	B	4830	H1
APPENDIX IV CONSTITUENTS																														
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND		ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.0000920	JB	ND	V1 U
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000722	JB	ND	V1 U
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.0128	J	0.010	D2 J
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND		NA		0.00196	JB	ND	U
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J	NA		0.000276	J	ND	U
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		ND	J			ND	J	ND	J	ND	JB	0.409	J	0.5	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U
Lithium	0.05	0.040 mg/L	0.0475	J	0.0527		0.0555		0.0524		0.0607		0.0724		0.0589		0.0554				0.0650		0.0592		0.0558		0.0633		0.05	D2 V1 J
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	B	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.000972	J	ND	D2 U
Radium 226	1	5 pCi/L	0.741		0.386		ND		0.751		ND		ND		0.462		ND				0.392		0.532		ND	U	0.450		0.548	
Radium 228																													0.698	
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND	J	ND		NA		0.00110	J	ND	U
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		0.0000610	J	ND	V1 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-104

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			3/29/2019		4/10/2019		10/25/2019	
			Characterization					
Boron	0.08		0.1880	JB	0.2710	JB	ND	D2, U
Calcium	0.5		465	B	502		505	D1
Chloride	3		1430		1430	B	1610	D
Fluoride	1		ND		0.3230	JB	0.4	
Sulfate	5		2870		2880	B	2440	D
pH (Field Measurement)	0.10		6.88		6.99		6.86	
Total Dissolved Solids	10		6990		6690		7330	
APPENDIX IV CONSTITUENTS								
Antimony	0.002	0.006 mg/L	0.0001	JB	0.0001	JB	ND	U
Arsenic	0.005	0.01 mg/L	0.0022	J	0.0021	J	0.0039	
Barium	0.2	2 mg/L	0.0243	J	0.0216	JB	0.030	
Beryllium	0.002	0.004 mg/L	ND		ND		ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		0.0004	J
Chromium	0.003	0.1 mg/L	0.0047	B	0.0036		0.0066	
Cobalt	0.005	0.006 mg/L	0.0059	B	0.0052		0.011	
Fluoride	1	4 mg/L	ND		0.3230	JB	0.4	
Lead	0.005	0.015 mg/L	0.0011	J	0.0002	J	0.003	
Lithium	0.05	0.040 mg/L	0.0281	J	0.0286	J	0.02	
Mercury	0.0002	0.002 mg/L	ND		ND	^	ND	U
Molybdenum	0.01	0.1 mg/L	0.0015	J	0.0010	J	0.005	J
Radium 226	1	5 pCi/L	0.7760		0.3190	U	0.126	
Radium 228							1.52	
Selenium	0.01	0.05 mg/L	ND		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		ND		ND	U

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GWPS = Groundwater Protection Standard
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Appendix C
Green Landfill Statistical Procedures and Results

1.0 GREEN LANDFILL STATISTICAL PROCEDURES AND RESULTS

The Appendix III and IV groundwater quality data for the Green Landfill were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient compliance monitoring wells to those present at a background monitoring well. For the Green Landfill, monitoring well MW-1 is designated as the background well because it is located upgradient, whereas monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 are designated as compliance wells because they are located downgradient.

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. Analytical data from the background monitoring wells collected between March 2016 and October 2019 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. ProUCL Version 5.1 was used to store the data and run the statistical analyses. The results of the analyses, including the UPLs, are provided in **Tables C1** and **C2**.

The statistical analysis results indicate that Appendix III constituents calcium, chloride, sulfate, and total dissolved solids (TDS) at monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 have SSIs over background (**Table C3**) that were confirmed by subsequent sampling events. Boron, fluoride, and pH did not have any verified SSIs over background. pH at MW-6 had a verified SSI below the background lower prediction limit (LPL). Based on these results, assessment monitoring was conducted at the landfill. Statistical analysis of the April and October 2019 Appendix IV assessment monitoring results indicate that arsenic and barium at monitoring well MW-2, lithium at monitoring wells MW-3A, MW-4, MW-5, and MW-6, and mercury at monitoring well MW-4 have verified SSIs over background (**Table C4**).

The Appendix IV constituents with SSIs were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the groundwater protection standards (GWPS) by calculating the lower confidence limit at 95% confidence (95LCL) for each well and constituent identified as a SSI using the baseline, detection, and assessment monitoring results collected to date. For a constituent to be present at a SSL over the GWPS, its 95LCL must be greater than the GWPS. **Table C5** provides a summary of the 95LCLs and GWPS for arsenic, barium, lithium, and mercury at monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6. The results indicate that lithium at monitoring wells MW-3A, MW-4, MW-5, and MW-6 (yellow highlight) is present as a SSL above the GWPS. The LCLs for the remaining wells and constituents (arsenic, barium, and mercury) are less than the GWPS and thus are not considered SSLs.

Table C1. Well MW-1 Appendix III Constituents Background Upper Prediction Limits

Parameter (Units)	Number of Samples	Percent Non-detects	Normal or Lognormal Distribution?	Statistical Test	Background Limit
Boron (mg/L)	13	0	Yes/Yes	Parametric	2.122
Calcium (mg/L)	13	0	Yes/Yes	Parametric	35
Chloride (mg/L)	13	0	Yes/No	Parametric	9.3
Fluoride (mg/L)	13	0	No/No	Nonparametric	0.89
pH (std units)	13	0	Yes/Yes	Parametric	6.99/7.93
Sulfate (mg/L)	13	0	Yes/Yes	Parametric	33
TDS (mg/L)	13	0	No/No	Nonparametric	636

Note: pH has both a lower prediction limit (LPL) and upper prediction limit (UPL); all other constituents are represented as UPLs

Table C2. Well MW-1 Appendix IV Constituents Background Upper Prediction Limits

Parameter (Units)	Number of Samples	Percent Non-detects	Normal or Lognormal Distribution?	Statistical Test	Background Limit
Antimony (mg/L)	13	31	No/No	Nonparametric	0.003
Arsenic (mg/L)	12	0	No/No	Nonparametric	0.0026
Barium (mg/L)	12	0	Yes/Yes	Parametric	0.098
Beryllium (mg/L)	12	92	No/No	Nonparametric	0.002
Cadmium (mg/L)	12	92	No/No	Nonparametric	0.001
Chromium (mg/L)	12	62	Yes/Yes	Parametric	0.0024
Cobalt (mg/L)	12	8	Yes/Yes	Parametric	0.0014
Fluoride (mg/L)	13	0	No/No	Nonparametric	0.89
Lead (mg/L)	13	46	Yes/No	Parametric	0.0003
Lithium (mg/L)	12	8	Yes/Yes	Parametric	0.037
Mercury (mg/L)	13	100	No/No	Nonparametric	0.0002
Molybdenum (mg/L)	13	31	No/No	Nonparametric	0.01
Ra-226+228 (pCi/L)	12	0	No/Yes	Parametric	1.74
Selenium (mg/L)	12	85	No/No	Nonparametric	0.01
Thallium (mg/L)	13	61	No/No	Nonparametric	0.0006

Note: The UPL for constituents with 100 percent nondetects (Be, Cd, and Hg) is established as the maximum laboratory analytical reporting limit.

Table C3. Big Rivers Green Landfill Appendix III SSI Summary

Well	Location	B	Ca	Cl	F	pH (LPL/UPL)		SO4	TDS
MW-1	Upgradient	P	P	P	NP	P	P	P	NP
MW-2	Downgradient								
MW-3A	Downgradient								
MW-4	Downgradient								
MW-5	Downgradient								
MW-6	Downgradient								

Notes:

SSIs determined using interwell prediction limits; MW-8 is upgradient background well

P = parametric prediction limit; NP = nonparametric prediction limit

Less than or equal to background upper prediction limit (UPL) or greater than lower prediction limit (LPL) for pH

Statistically significant increase (SSI) over background UPL or below background LPL for pH

Table C4. Big Rivers Green Landfill Appendix IV SSI Summary

Well	Location	Sb	As	Ba	Be	Cd	Cr	Co	F	Pb	Li	Hg	Mo	Ra-226+228	Se	Tl
MW-1	Upgradient	NP	Np	P	NP	NP	P	P	NP	Pb	P	NP	NP	P	NP	NP
MW-2	Downgradient															
MW-3A	Downgradient															
MW-4	Downgradient															
MW-5	Downgradient															
MW-6	Downgradient															

Notes:

SSIs determined using interwell prediction limits; MW-8 is upgradient background well

P = parametric prediction limit; NP = nonparametric prediction limit

Less than or equal to background upper prediction limit (UPL) or greater than lower prediction limit (LPL) for pH

Statistically significant increase (SSI) over background UPL or below background LPL for pH

Table C5. Summary of LCLs and GWPS for Arsenic, Barium, Lithium, and Mercury

Well	Parameter	95%LCL (mg/L)	GWPS (mg/L)
MW-2	Arsenic	0.008	0.01
MW-2	Barium	0.25	2.0
MW-3A	Lithium	**0.65**	0.04
MW-3A	Mercury	0.0001	0.002
MW-4	Lithium	**1.04**	0.04
MW-5	Lithium	**0.32**	0.04
MW-6	Lithium	**0.055**	0.04

95%LCL = lower confidence limit at 95% confidence. Yellow highlighted results exhibit a statistically significant level (SSL) above the GWPS.

Appendix D
Green Landfill – April 2020 Groundwater Analytical Data

Pace Analytical Services, LLC
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Certificate of Analysis
0041376

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 04/30/2020 14:59

Project Name:	Green Landfill Semiannual Groundwater	Workorder:	0041376

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/07/2020 15:49.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0041376-01	MW1/	Groundwater	04/06/2020 13:05	04/07/2020 15:49	Phillip Hill
0041376-02	MW2/	Groundwater	04/07/2020 11:40	04/07/2020 15:49	Phillip Hill
0041376-03	MW3A/	Groundwater	04/07/2020 13:55	04/07/2020 15:49	Phillip Hill
0041376-04	MW4/	Groundwater	04/07/2020 09:55	04/07/2020 15:49	Phillip Hill
0041376-05	MW5/	Groundwater	04/07/2020 10:10	04/07/2020 15:49	Phillip Hill
0041376-06	MW6/	Groundwater	04/06/2020 14:20	04/07/2020 15:49	Phillip Hill
0041376-07	DUPLICATE/	Groundwater	04/07/2020 10:20	04/07/2020 15:49	Phillip Hill
0041376-08	FIELD BLANK/	Water	04/07/2020 11:50	04/07/2020 15:49	Phillip Hill

LabNumber	Measurement	Value
0041376-01	Field Conductance	867
	Field pH	7.22
	Field Temp (C)	18.23
0041376-02	Field Conductance	1590
	Field pH	6.92
	Field Temp (C)	16.86
0041376-03	Field Conductance	8090
	Field pH	6.92
	Field Temp (C)	16.86
0041376-04	Field Conductance	6770
	Field pH	6.70
	Field Temp (C)	16.47
0041376-05	Field Conductance	6250
	Field pH	6.77
	Field Temp (C)	14.85
0041376-06	Field Conductance	5010
	Field pH	6.36
	Field Temp (C)	20.50
0041376-07	Field Conductance	6770
	Field pH	6.70
	Field Temp (C)	16.47

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-01**
Description: **MW1**

Sample Collection Date Time: 04/06/2020 13:05
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Arsenic	**0.0019**		mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Barium	**0.087**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Boron	**1.69**	D1, M3	mg/L	1.00	1.00	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:42	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Calcium	**27.7**	D1, M3	mg/L	4.00	1.30	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:42	DMH
Chromium	**0.0011**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Iron	**1.57**		mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:39	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Sodium	**206**	D1, M3	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:46	DMH
Thallium	**0.0001**	J	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	8	8	HACH 8000	04/10/2020 13:13	04/10/2020 13:13	ALT
Specific Conductance (Lab)	**962**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:52	04/09/2020 15:52	JLW
pH (Lab)	**7.50**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:14	04/09/2020 16:14	GAT
Total Dissolved Solids	**488**		mg/L	50	50	2540 C-2011	04/13/2020 10:14	04/14/2020 12:26	MAG
Total Organic Carbon	**1.0**		mg/L	0.5		5310 C-2011	04/14/2020 10:27	04/14/2020 10:27	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.340**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.468**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.808**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**6.5**		mg/L	2.0	1.3	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC
Sulfate	**21**		mg/L	1	0.5	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-02**
Description: **MW2**

Sample Collection Date Time: 04/07/2020 11:40
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Arsenic	**0.0033**		mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Barium	**0.238**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:49	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Calcium	**145**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:55	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Iron	**0.459**		mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:49	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Lithium	**0.007**	J	mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Sodium	**66.5**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:55	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**12**		mg/L	8	8	HACH 8000	04/10/2020 13:13	04/10/2020 13:13	ALT
Specific Conductance (Lab)	**1530**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:53	04/09/2020 15:53	JLW
pH (Lab)	**7.22**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:15	04/09/2020 16:15	CML
Total Dissolved Solids	**806**		mg/L	50	50	2540 C-2011	04/13/2020 10:18	04/14/2020 12:26	MAG
Total Organic Carbon	**1.0**		mg/L	0.5		5310 C-2011	04/14/2020 10:48	04/14/2020 10:48	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.513**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.016**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.529**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**120**	D	mg/L	100	64.0	SW846 9056	04/16/2020 01:29	04/16/2020 01:29	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 01:12	04/16/2020 01:12	CSC
Sulfate	**85**	D	mg/L	50	25	SW846 9056	04/16/2020 01:29	04/16/2020 01:29	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-03**
Description: **MW3A**

Sample Collection Date Time: 04/07/2020 13:55
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Barium	**0.042**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Boron	**0.26**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:11	DMH
Cadmium	**0.0001**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Calcium	**425**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:17	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:11	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Lithium	**0.68**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Sodium	**352**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:17	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**160**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**7660**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:54	04/09/2020 15:54	JLW
pH (Lab)	**7.07**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:16	04/09/2020 16:16	CML
Total Dissolved Solids	**5860**		mg/L	50	50	2540 C-2011	04/13/2020 10:22	04/14/2020 12:26	MAG
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	04/14/2020 12:15	04/14/2020 12:15	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.603**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.460**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.06**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**3220**	D	mg/L	200	128	SW846 9056	04/16/2020 02:02	04/16/2020 02:02	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	04/16/2020 01:45	04/16/2020 01:45	CSC
Sulfate	**1840**	D	mg/L	100	50	SW846 9056	04/16/2020 02:02	04/16/2020 02:02	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-04**
Description: **MW4**

Sample Collection Date Time: 04/07/2020 09:55
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Barium	**0.022**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Boron	**0.83**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:20	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Calcium	**464**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:27	DMH
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:20	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Lithium	**0.82**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Mercury	**0.0003**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Selenium	**0.023**		mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Sodium	**433**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:27	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**44**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**6460**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:55	04/09/2020 15:55	JLW
pH (Lab)	**7.10**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:17	04/09/2020 16:17	CML
Total Dissolved Solids	**5120**		mg/L	50	50	2540 C-2011	04/13/2020 10:26	04/14/2020 12:26	MAG
Total Organic Carbon	**0.6**		mg/L	0.5		5310 C-2011	04/14/2020 12:37	04/14/2020 12:37	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.476**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.787**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.26**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1560**	D	mg/L	200	128	SW846 9056	04/16/2020 02:34	04/16/2020 02:34	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 02:18	04/16/2020 02:18	CSC
Sulfate	**4000**	D	mg/L	100	50	SW846 9056	04/16/2020 02:34	04/16/2020 02:34	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-05**
Description: **MW5**

Sample Collection Date Time: 04/07/2020 10:10
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Barium	**0.014**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Boron	**0.25**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:30	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Calcium	**464**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:36	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:30	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Lithium	**0.38**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Sodium	**217**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:36	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**463**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**5950**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:56	04/09/2020 15:56	JLW
pH (Lab)	**6.94**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:18	04/09/2020 16:18	CML
Total Dissolved Solids	**4960**		mg/L	50	50	2540 C-2011	04/13/2020 10:30	04/14/2020 12:26	MAG
Total Organic Carbon	**0.6**		mg/L	0.5		5310 C-2011	04/16/2020 21:48	04/16/2020 21:48	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.302**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**1.18**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.48**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1860**	D	mg/L	200	128	SW846 9056	04/16/2020 03:07	04/16/2020 03:07	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 02:51	04/16/2020 02:51	CSC
Sulfate	**3720**	D	mg/L	100	50	SW846 9056	04/16/2020 03:07	04/16/2020 03:07	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-06**
Description: **MW6**

Sample Collection Date Time: 04/06/2020 14:20
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Boron	**0.19**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:49	DMH
Cadmium	**0.0001**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Calcium	**458**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:55	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Iron	**0.078**	J	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:49	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Lithium	**0.05**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Sodium	**435**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:55	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**22**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**4960**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:57	04/09/2020 15:57	JLW
pH (Lab)	**6.76**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:19	04/09/2020 16:19	CML
Total Dissolved Solids	**4610**		mg/L	50	50	2540 C-2011	04/13/2020 10:34	04/14/2020 12:26	MAG
Total Organic Carbon	**2.0**		mg/L	0.5		5310 C-2011	04/16/2020 22:11	04/16/2020 22:11	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.061**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.683**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.744**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**181**	D	mg/L	100	64.0	SW846 9056	04/16/2020 04:13	04/16/2020 04:13	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/16/2020 03:57	04/16/2020 03:57	CSC
Sulfate	**4650**	D	mg/L	100	50	SW846 9056	04/16/2020 12:57	04/16/2020 12:57	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-07**
Description: **DUPLICATE**

Sample Collection Date Time: 04/07/2020 10:20
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Barium	**0.022**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Boron	**0.86**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:58	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Calcium	**503**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:05	DMH
Chromium	**0.0009**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:58	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Lithium	**0.84**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Mercury	**0.0003**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Molybdenum	**0.003**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Selenium	**0.025**		mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Sodium	**468**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:05	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**62**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**6410**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:58	04/09/2020 15:58	JLW
pH (Lab)	**7.12**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:20	04/09/2020 16:20	CML
Total Dissolved Solids	**4700**		mg/L	50	50	2540 C-2011	04/13/2020 10:38	04/14/2020 12:26	MAG
Total Organic Carbon	**0.8**		mg/L	0.5		5310 C-2011	04/16/2020 22:34	04/16/2020 22:34	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.371**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**1.10**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.47**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1480**	D	mg/L	100	64.0	SW846 9056	04/21/2020 14:14	04/21/2020 14:14	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 04:46	04/16/2020 04:46	CSC
Sulfate	**4050**	D	mg/L	100	50	SW846 9056	04/23/2020 12:44	04/23/2020 12:44	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-08**
Description: **FIELD BLANK**

Sample Collection Date Time: 04/07/2020 11:50
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Sodium	ND	U	mg/L	0.26	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	8	8	HACH 8000	04/10/2020 13:15	04/10/2020 13:15	ALT
Specific Conductance (Lab)	**8**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:59	04/09/2020 15:59	JLW
pH (Lab)	**7.62**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:21	04/09/2020 16:21	CML
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	04/13/2020 10:42	04/14/2020 12:26	MAG
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	04/16/2020 22:57	04/16/2020 22:57	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.224**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.262**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.486**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	M1, U	mg/L	2.0	1.3	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC
Fluoride	ND	M1, U	mg/L	0.2	0.1	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC
Sulfate	ND	M1, U	mg/L	1	0.5	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC

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Notes for work order 0041376

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
Blank (B015276-BLK1)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:05										
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
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 (B015276-BLK2)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:33										
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
LCS (B015276-BS1)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:09										
Molybdenum	0.07	0.01	mg/L	0.0625		105	85-115			
Antimony	0.068	0.005	mg/L	0.0625		109	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		98.3	85-115			
Arsenic	0.0645	0.0010	mg/L	0.0625		103	85-115			
Barium	0.062	0.004	mg/L	0.0625		99.5	85-115			
Beryllium	0.0613	0.0020	mg/L	0.0625		98.1	85-115			
Cadmium	0.0621	0.0010	mg/L	0.0625		99.4	85-115			
Chromium	0.0641	0.0020	mg/L	0.0625		103	85-115			
Cobalt	0.064	0.004	mg/L	0.0625		102	85-115			
Copper	0.060	0.003	mg/L	0.0625		95.6	85-115			
Lead	0.062	0.002	mg/L	0.0625		98.7	85-115			
Lithium	0.06	0.02	mg/L	0.0625		96.9	85-115			
Selenium	0.065	0.003	mg/L	0.0625		104	85-115			
Thallium	0.0632	0.0020	mg/L	0.0625		101	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
LCS (B015276-BS2)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:36										
Boron	0.12	0.10	mg/L	0.125		94.1	85-115			
Calcium	5.92	0.40	mg/L	6.25		94.8	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Sodium	6.12	0.26	mg/L	6.25		97.9	85-115			
Matrix Spike (B015276-MS1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:59										
Molybdenum	0.06	0.01	mg/L	0.0625	ND	102	80-120			
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	93.6	80-120			
Arsenic	0.0634	0.0010	mg/L	0.0625	0.0019	98.3	80-120			
Barium	0.150	0.004	mg/L	0.0625	0.087	101	80-120			
Beryllium	0.0547	0.0020	mg/L	0.0625	ND	87.4	80-120			
Cadmium	0.0562	0.0010	mg/L	0.0625	ND	89.9	80-120			
Chromium	0.0656	0.0020	mg/L	0.0625	0.0011	103	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.056	0.003	mg/L	0.0625	ND	89.6	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	90.2	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.03	95.1	80-120			
Selenium	0.055	0.003	mg/L	0.0625	ND	88.1	80-120			
Thallium	0.0579	0.0020	mg/L	0.0625	0.0001	92.5	80-120			
Matrix Spike (B015276-MS2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:58										
Boron	1.85	1.00	mg/L	0.125	1.69	132	80-120			D2, M3
Calcium	34.4	4.00	mg/L	6.25	27.7	106	80-120			D2
Iron	7.68	1.00	mg/L	6.25	1.57	97.8	80-120			D2
Sodium	205	2.60	mg/L	6.25	206	NR	80-120			D2, M3
Matrix Spike Dup (B015276-MSD1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 17:03										
Antimony	0.071	0.005	mg/L	0.0625	ND	114	80-120	7.69	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	99.2	80-120	5.81	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120	4.09	20	
Arsenic	0.0677	0.0010	mg/L	0.0625	0.0019	105	80-120	6.64	20	
Barium	0.157	0.004	mg/L	0.0625	0.087	111	80-120	4.16	20	
Beryllium	0.0585	0.0020	mg/L	0.0625	ND	93.6	80-120	6.82	20	
Cadmium	0.0610	0.0010	mg/L	0.0625	ND	97.6	80-120	8.15	20	
Chromium	0.0684	0.0020	mg/L	0.0625	0.0011	108	80-120	4.12	20	
Cobalt	0.066	0.004	mg/L	0.0625	ND	106	80-120	4.34	20	
Copper	0.059	0.003	mg/L	0.0625	ND	94.0	80-120	4.78	20	
Lead	0.061	0.002	mg/L	0.0625	ND	97.1	80-120	7.36	20	
Lithium	0.09	0.02	mg/L	0.0625	0.03	98.1	80-120	2.10	20	
Selenium	0.061	0.003	mg/L	0.0625	ND	97.1	80-120	9.79	20	
Thallium	0.0613	0.0020	mg/L	0.0625	0.0001	97.8	80-120	5.64	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
Matrix Spike Dup (B015276-MSD2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 18:11										
Boron	1.80	1.00	mg/L	0.125	1.69	88.6	80-120	2.95	20	D2
Calcium	35.3	4.00	mg/L	6.25	27.7	121	80-120	2.64	20	D2, M3
Iron	8.28	1.00	mg/L	6.25	1.57	107	80-120	7.50	20	D2
Sodium	208	2.60	mg/L	6.25	206	23.5	80-120	1.56	20	D2, M3
Post Spike (B015276-PS1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 17:06										
Antimony	65.3		ug/L	62.5	0.087	104	75-125			
Mercury	2.49		ug/L	2.50	0.0595	97.1	75-125			
Molybdenum	62.9		ug/L	62.5	1.02	99.0	75-125			
Arsenic	63.0		ug/L	62.5	1.92	97.7	75-125			
Barium	153		ug/L	62.5	87.2	105	75-125			
Beryllium	55.2		ug/L	62.5	-0.0177	88.4	75-125			
Cadmium	57.4		ug/L	62.5	0.0329	91.8	75-125			
Chromium	63.2		ug/L	62.5	1.10	99.4	75-125			
Cobalt	61.3		ug/L	62.5	0.695	96.9	75-125			
Copper	54.1		ug/L	62.5	-2.87	86.6	75-125			
Lead	56.6		ug/L	62.5	0.013	90.6	75-115			
Lithium	85.9		ug/L	62.5	28.0	92.7	75-125			
Selenium	56.3		ug/L	62.5	0.072	89.9	75-125			
Thallium	57.4		ug/L	62.5	0.118	91.7	75-125			
Post Spike (B015276-PS2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 18:14										
Boron	1820		ug/L	125	1690	107	75-125			D2
Calcium	33800		ug/L	6250	27700	96.6	75-125			D2
Iron	7590		ug/L	6250	1570	96.4	75-125			D2
Sodium	202000		ug/L	6250	206000	NR	75-125			D2, M3

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015432 - Default Prep Wet Chem										
Blank (B015432-BLK1)										
Prepared: 4/14/2020 1:48, Analyzed: 4/14/2020 1:48										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B015432-BS1)										
Prepared: 4/14/2020 2:09, Analyzed: 4/14/2020 2:09										
Total Organic Carbon	4.8	0.5	mg/L	5.00		95.5	80-120			
Duplicate (B015432-DUP1)	**Source: 0040539-01**									
Prepared: 4/14/2020 7:34, Analyzed: 4/14/2020 7:34										
Total Organic Carbon	2.0	0.5	mg/L		2.0			1.22	25	
Duplicate (B015432-DUP2)	**Source: 0041286-01**									
Prepared: 4/14/2020 12:59, Analyzed: 4/14/2020 12:59										
Total Organic Carbon	1.1	0.5	mg/L		1.1			5.36	25	
Matrix Spike (B015432-MS1)	**Source: 0040539-02**									
Prepared: 4/14/2020 7:55, Analyzed: 4/14/2020 7:55										
Total Organic Carbon	3.6	0.5	mg/L	2.50	1.1	102	80-120			
Matrix Spike (B015432-MS2)	**Source: 0041286-02**									
Prepared: 4/14/2020 13:20, Analyzed: 4/14/2020 13:20										
Total Organic Carbon	5.9	0.5	mg/L	5.00	0.9	100	80-120			
Batch B015433 - Default Prep Wet Chem										
Blank (B015433-BLK2)										
Prepared: 4/16/2020 20:16, Analyzed: 4/16/2020 20:16										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B015433-BS2)										
Prepared: 4/16/2020 20:39, Analyzed: 4/16/2020 20:39										
Total Organic Carbon	4.9	0.5	mg/L	5.00		98.4	80-120			
Duplicate (B015433-DUP1)	**Source: 0041409-01**									
Prepared: 4/14/2020 23:44, Analyzed: 4/14/2020 23:44										
Total Organic Carbon	1.0	0.5	mg/L		1.0			2.11	25	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015433 - Default Prep Wet Chem										
Duplicate (B015433-DUP3) **Source: 0042383-01**										
Prepared: 4/15/2020 12:23, Analyzed: 4/15/2020 12:23										
Total Organic Carbon	2.2	0.5	mg/L		2.2			1.81	25	
Matrix Spike (B015433-MS1) **Source: 0041409-02**										
Prepared: 4/15/2020 0:07, Analyzed: 4/15/2020 0:07										
Total Organic Carbon	3.4	0.5	mg/L	2.50	0.9	99.6	80-120			
Matrix Spike (B015433-MS3) **Source: 0042383-02RE1**										
Prepared: 4/15/2020 12:46, Analyzed: 4/15/2020 12:46										
Total Organic Carbon	6.4	0.5	mg/L	5.00	1.4	101	80-120			
Batch B015469 - Default Prep Wet Chem										
LCS (B015469-BS1)										
Prepared: 4/9/2020 16:08, Analyzed: 4/9/2020 16:08										
pH (Lab)	7.98		Std. Units	8.00		99.8	98.8-101.2			
LCS (B015469-BS2)										
Prepared: 4/9/2020 16:26, Analyzed: 4/9/2020 16:26										
pH (Lab)	8.04		Std. Units	8.00		100	98.8-101.2			
Duplicate (B015469-DUP1) **Source: 0041388-02**										
Prepared: 4/9/2020 16:24, Analyzed: 4/9/2020 16:24										
pH (Lab)	7.29	0.10	Std. Units		7.27			0.275	10	
Duplicate (B015469-DUP2) **Source: 0060028-01**										
Prepared: 4/9/2020 16:34, Analyzed: 4/9/2020 16:34										
pH (Lab)	7.77	0.10	Std. Units		7.76			0.129	10	
Batch B015470 - Default Prep Wet Chem										
Blank (B015470-BLK1)										
Prepared: 4/9/2020 15:46, Analyzed: 4/9/2020 15:46										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015470 - Default Prep Wet Chem										
LCS (B015470-BS1)										
Prepared: 4/9/2020 15:47, Analyzed: 4/9/2020 15:47										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (B015470-DUP1)	**Source: 0042630-01**									
Prepared: 4/9/2020 16:02, Analyzed: 4/9/2020 16:02										
Specific Conductance (Lab)	202	1	umhos/cm		202			0.148	1.24	
Batch B015517 - Default Prep Wet Chem										
Blank (B015517-BLK1)										
Prepared: 4/10/2020 13:09, Analyzed: 4/10/2020 13:09										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (B015517-BS1)										
Prepared: 4/10/2020 13:09, Analyzed: 4/10/2020 13:09										
Chemical Oxygen Demand	116	8	mg/L	125		93.0	90-110			
Duplicate (B015517-DUP1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	ND	8	mg/L		ND				25	U
Matrix Spike (B015517-MS1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	262	8	mg/L	250	ND	105	90-110			
Matrix Spike Dup (B015517-MSD1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	256	8	mg/L	250	ND	102	90-110	2.46	10	
Batch B016032 - Default Prep Wet Chem										
Blank (B016032-BLK1)										
Prepared: 4/13/2020 9:34, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	ND	25	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016032 - Default Prep Wet Chem										
LCS (B016032-BS1)										
Prepared: 4/13/2020 9:38, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	1480	25	mg/L	1500		98.7	80-120			
Duplicate (B016032-DUP1) **Source: 0040819-01**										
Prepared: 4/13/2020 10:50, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	206	50	mg/L		226			9.26	10	
Duplicate (B016032-DUP2) **Source: 0041376-08**										
Prepared: 4/13/2020 10:54, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	ND	50	mg/L		ND				10	U

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016360 - Default Prep IC										
Blank (B016360-BLK1)										
Prepared: 4/16/2020 0:39, Analyzed: 4/16/2020 0:39										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B016360-BS1)										
Prepared: 4/16/2020 0:23, Analyzed: 4/16/2020 0:23										
Fluoride	9.5		mg/L	10.0		95.0	90-110			
Chloride	9.5		mg/L	10.0		94.9	90-110			
Sulfate	10		mg/L	10.0		98.1	90-110			
Matrix Spike (B016360-MS1) **Source: 0041376-08**										
Prepared: 4/16/2020 5:20, Analyzed: 4/16/2020 5:20										
Fluoride	13.2		mg/L	10.0	0.0	132	75-125			M1
Chloride	13.1		mg/L	10.0	0.1	130	75-125			M1
Sulfate	14		mg/L	10.0	0.1	139	75-125			M1
Matrix Spike Dup (B016360-MSD1) **Source: 0041376-08**										
Prepared: 4/16/2020 5:37, Analyzed: 4/16/2020 5:37										
Chloride	12.3		mg/L	10.0	0.1	122	75-125	6.11	15	
Fluoride	12.5		mg/L	10.0	0.0	125	75-125	5.37	15	
Sulfate	13		mg/L	10.0	0.1	125	75-125	10.7	15	
Batch B016418 - Default Prep IC										
Blank (B016418-BLK1)										
Prepared: 4/16/2020 12:41, Analyzed: 4/16/2020 12:41										
Sulfate	ND	1	mg/L							U
LCS (B016418-BS1)										
Prepared: 4/16/2020 12:24, Analyzed: 4/16/2020 12:24										
Sulfate	10		mg/L	10.0		98.8	90-110			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016418 - Default Prep IC										
Matrix Spike (B016418-MS1) **Source: 0043228-02**										
Prepared: 4/16/2020 14:36, Analyzed: 4/16/2020 14:36										
Sulfate	30		mg/L	10.0	17	121	75-125			
Matrix Spike Dup (B016418-MSD1) **Source: 0043228-02**										
Prepared: 4/16/2020 14:52, Analyzed: 4/16/2020 14:52										
Sulfate	30		mg/L	10.0	17	130	75-125	2.87	15	M1

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030)
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
SW846 6010 B in Water	

Sample Acceptance Checklist for Work Order 0041376

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-01 A	4/6/20	1305	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 : ✓				
0041376-01 B	4/6/20	1305	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 : ✓				
0041376-01 C	4/6/20	1305	Plastic 1L	1	MW1	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1305

pH 7.22 Cond ~~(umho)~~ mS/cm 0.867 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 18.23 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
	(1.9°)	4-7-20	1549

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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) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-01 D	4/6/20	1305	Plastic 500mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW1	g / c	COD TOC
0041376-01 E	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 226 (sub)
0041376-01 F	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 228 (sub)
0041376-01 G	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 228 (sub)
0041376-01 H	4/6/20	1305	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW1	g / c	TOC

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) _____ Time (24 hr) _____

pH 7.22 Cond ~~(umho)~~ 0.867 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 18.29 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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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) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-02 A	4/7/20	1140	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 : ✓				
0041376-02 B	4/7/20	1140	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 : ✓				
0041376-02 C	4/7/20	1140	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-02 D	4/7/20	1140	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1140

pH 6.92 Cond ~~(umho)~~ 1.59 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 1686 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ , or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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PWS ID#:
State: KY

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Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-02 E	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 226 (sub)
0041376-02 F	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 228 (sub)
0041376-02 G	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 228 (sub)
0041376-02 H	4/7/20	1140	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW2	g / c	TOC
0041376-03 A	4/7/20	1355	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1140

pH 6.92 Cond (umho) 1.59 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.84 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
_____	_____	4/7/20	1443
_____	_____	4-7-20	1549
_____	_____	_____	_____
_____	_____	_____	_____

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Project: Green Landfill Semiannual Groundwater

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Chad Phillips
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PWS ID#:
State: KY

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-03 B	4/7/20	1355	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 : ✓				
0041376-03 C	4/7/20	1355	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-03 D	4/7/20	1355	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-03 E	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-03 F	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1355

pH 6.86 Cond ~~(umho)~~ 8.09 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.32 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-03 G	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW3A	g / c	Radium 228 (sub)
0041376-03 H	4/7/20	1355	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW3A	g / c	TOC
0041376-04 A	4/7/20	955	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 : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) _____ Time (24 hr) _____

pH 6.86 Cond (~~umho~~) 8.09 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.32 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-04 B	4/7/20	955	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 : ✓				
0041376-04 C	4/7/20	955	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-04 D	4/7/20	955	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-04 E	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-04 F	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 955

pH 6.70 Cond (~~umho~~) 6.77 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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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) ___

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-04 G	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW4	g / c	Radium 228 (sub)
0041376-04 H	4/7/20	955	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW4	g / c	TOC
0041376-05 A	4/7/20	1010	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 : ✓

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 955

pH 6.70 Cond ~~(umho)~~ 6.77 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.47 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
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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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-05 B	4/7/20	1010	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 : ✓				
0041376-05 C	4/7/20	1010	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-05 D	4/7/20	1010	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-05 E	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-05 F	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1010

pH 6.77 ~~Cond (umho)~~ 6.25 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.85 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-05 G	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ~	1	MW5	g / c	Radium 228 (sub)
0041376-05 H	4/7/20	1010	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW5	g / c	TOC
0041376-06 A	4/6/20	1420	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 : ✓

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1010

pH 6.77 Cond (~~umho~~) 6.25 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.85 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ **PACE- Check here if trip charge applied to associated COC**

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-06 B	4/6/20	1420	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 : ✓				
0041376-06 C	4/6/20	1420	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-06 D	4/6/20	1420	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-06 E	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-06 F	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1420

pH 6.36 Cond ~~(umho)~~ 5.01 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 20.50 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation
Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-06 G	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW6	g / c	Radium 228 (sub)
0041376-06 H	4/6/20	1420	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW6	g / c	TOC
0041376-07 A	4/7/20	1020	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :** ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1420

pH 6.36 Cond ~~(umho)~~ 5.01 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 20.50 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes L 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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-07 B	4/7/20	1020	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 : ✓				
0041376-07 C	4/7/20	1020	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-07 D	4/7/20	1020	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-07 E	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-07 F	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1020

pH 6.70 Cond ~~(umho)~~ 677 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 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)
	Traci Smith	4/7/20	1443
Traci Smith		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-07 G	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	Radium 228 (sub)
0041376-07 H	4/7/20	1020	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	TOC
0041376-08 A	4/7/20	1150	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :** ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1020

pH 6.70 Cond ~~(umho)~~ 6.77 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1447
		4-7-20	1549

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-08 B	4/7/20	1150	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 : ✓				
0041376-08 C	4/7/20	1150	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-08 D	4/7/20	1150	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-08 E	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-08 F	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1150

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

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Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-08 G	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	FIELD BLANK	g / c	Radium 228 (sub)
0041376-08 H	4/7/20	1150	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	FIELD BLANK	g / c	TOC
			HNO3 **Preservation Check: pH :** ____	1			Be 6020 Cadmium Tot 6020 Cadmium Tot 6010B Cobalt Tot 6020 Iron Tot 6020 Antimony 6020 Sodium Tot 6010B

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1150

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

April 30, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 41376
Pace Project No.: 30358430

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 10, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 41376
Pace Project No.: 30358430

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 41376
Pace Project No.: 30358430

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30358430001	**0041376-01**	Water	04/06/20 13:05	04/10/20 09:15
30358430002	**0041376-02**	Water	04/07/20 11:40	04/10/20 09:15
30358430003	**0041376-03**	Water	04/07/20 13:55	04/10/20 09:15
30358430004	**0041376-04**	Water	04/07/20 09:55	04/10/20 09:15
30358430005	**0041376-05**	Water	04/07/20 10:10	04/10/20 09:15
30358430006	**0041376-06**	Water	04/06/20 14:20	04/10/20 09:15
30358430007	**0041376-07**	Water	04/07/20 10:20	04/10/20 09:15
30358430008	**0041376-08**	Water	04/07/20 11:50	04/10/20 09:15

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 41376
Pace Project No.: 30358430

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30358430001	**0041376-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430002	**0041376-02**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430003	**0041376-03**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430004	**0041376-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430005	**0041376-05**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430006	**0041376-06**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430007	**0041376-07**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430008	**0041376-08**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-01 **Lab ID: 30358430001** Collected: 04/06/20 13:05 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.340 ± 0.473 (0.799) C:NA T:94%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.468 ± 0.409 (0.828) C:72% T:87%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.808 ± 0.882 (1.63)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-02 **Lab ID: 30358430002** Collected: 04/07/20 11:40 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.513 ± 0.402 (0.472) C:NA T:88%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.0161 ± 0.343 (0.794) C:70% T:88%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.529 ± 0.745 (1.27)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-03 **Lab ID: 30358430003** Collected: 04/07/20 13:55 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.603 ± 0.577 (0.878) C:NA T:77%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.460 ± 0.444 (0.914) C:68% T:85%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.06 ± 1.02 (1.79)**	pCi/L	04/30/20 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-04 **Lab ID: 30358430004** Collected: 04/07/20 09:55 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.476 ± 0.455 (0.693) C:NA T:95%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.787 ± 0.428 (0.770) C:74% T:84%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.26 ± 0.883 (1.46)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-05 **Lab ID: 30358430005** Collected: 04/07/20 10:10 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.302 ± 0.371 (0.605) C:NA T:95%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.18 ± 0.498 (0.824) C:71% T:90%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.48 ± 0.869 (1.43)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-06 **Lab ID: 30358430006** Collected: 04/06/20 14:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0612 ± 0.279 (0.166) C:NA T:90%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.683 ± 0.478 (0.939) C:68% T:88%**	pCi/L	04/28/20 11:05	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-06 **Lab ID: 30358430006** Collected: 04/06/20 14:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.744 ± 0.757 (1.11)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-07 **Lab ID: 30358430007** Collected: 04/07/20 10:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.371 ± 0.345 (0.455) C:NA T:83%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.10 ± 0.486 (0.817) C:74% T:84%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.47 ± 0.831 (1.27)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-08 **Lab ID: 30358430008** Collected: 04/07/20 11:50 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.224 ± 0.515 (0.933) C:NA T:94%**	pCi/L	04/30/20 11:40	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.262 ± 0.427 (0.928) C:74% T:84%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.486 ± 0.942 (1.86)**	pCi/L	04/30/20 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

QC Batch: 392089 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: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

METHOD BLANK: 1898525 Matrix: Water
Associated Lab Samples: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.230 ± 0.329 (0.705) C:78% T:76%	pCi/L	04/28/20 11:05	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

QC Batch: 392088 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: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

METHOD BLANK: 1898523 Matrix: Water
Associated Lab Samples: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.176 ± 0.366 (0.660) C:NA T:95%	pCi/L	04/30/20 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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 41376
Pace Project No.: 30358430

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.

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.

SAMPLE QUALIFIERS

Sample: 30358430007

[2] Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Sample: 30358430008

[1] Sample collection dates and times were not present on the sample containers.

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 41376 Workorder Name: Green Landfill Semiannual Owner Received Date: 4/7/2020 Results Requested By:

Report To:	Subcontract To:	Requested Analysis

McCoy & McCoy Labs
P.O. Box 907
Madisonville, KY 42409
270-821-7375
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
(724) 850-5615

WO# : 30358430

30358430

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix ~~Drinking~~	Preserved Containers					EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	0041376-01		04/06/20 13:05	IR44-McCoy	Water						X	X	001
3	0041376-02		04/07/20 11:40	IR44-McCoy	Water						X	X	002
4	0041376-03		04/07/20 13:55	IR44-McCoy	Water						X	X	003
5	0041376-04		04/07/20 09:55	IR44-McCoy	Water						X	X	004
6	0041376-05		04/07/20 10:10	IR44-McCoy	Water						X	X	005
7	0041376-06		04/06/20 14:20	IR44-McCoy	Water						X	X	006
8	0041376-07		04/07/20 10:20	IR44-McCoy	Water						X	X	007
9	0041376-08		04/07/20 11:50	IR44-McCoy	Water						X	X	008
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			Nicole Rund	4/10/2020 0915	
2					
3					

Cooler Temperature on Receipt 4.7 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0041376

30358430

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:

Please return shipping cooler to return address on shipping label.

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0041376-01	**Water**	**Sampled:04/06/2020 13:05**	**Specific Method**	
Radium 228 (sub)		10/03/2020 13:05	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/03/2020 13:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/03/2020 13:05	EPA 903.1	
Sample ID: 0041376-02	**Water**	**Sampled:04/07/2020 11:40**	**Specific Method**	
Radium 226 (sub)		10/04/2020 11:40	EPA 903.1	
Radium 228 (sub)		10/04/2020 11:40	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 11:40	EPA 904.0 Radium Sum C	
Sample ID: 0041376-03	**Water**	**Sampled:04/07/2020 13:55**	**Specific Method**	
Radium Total (sub)		10/04/2020 13:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 13:55	EPA 903.1	
Radium 228 (sub)		10/04/2020 13:55	EPA 904.0 Radium Sum C	
Sample ID: 0041376-04	**Water**	**Sampled:04/07/2020 09:55**	**Specific Method**	
Radium 226 (sub)		10/04/2020 09:55	EPA 903.1	
Radium 228 (sub)		10/04/2020 09:55	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 09:55	EPA 904.0 Radium Sum C	
Sample ID: 0041376-05	**Water**	**Sampled:04/07/2020 10:10**	**Specific Method**	
Radium 228 (sub)		10/04/2020 10:10	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 10:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 10:10	EPA 903.1	
Sample ID: 0041376-06	**Water**	**Sampled:04/06/2020 14:20**	**Specific Method**	
Radium 226 (sub)		10/03/2020 14:20	EPA 903.1	
Radium 228 (sub)		10/03/2020 14:20	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/03/2020 14:20	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	04.09.20		
Released By	Date	Received By	Date

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky # 30358430

0041376

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0041376-07	**Water**	**Sampled:04/07/2020 10:20**	**Specific Method**	
Radium 226 (sub)		10/04/2020 10:20	EPA 903.1	
Radium 228 (sub)		10/04/2020 10:20	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 10:20	EPA 904.0 Radium Sum C	
Sample ID: 0041376-08	**Water**	**Sampled:04/07/2020 11:50**	**Specific Method**	
Radium Total (sub)		10/04/2020 11:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 11:50	EPA 903.1	
Radium 228 (sub)		10/04/2020 11:50	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	04.09.20		
Released By	Date	Received By	Date

Sample Custody

30358430

By Nancy Yeager

Printed 04/09/2020 09:05

Lab ID	Container	Cooler	Last Owner	Department	Location	Home Location	Status	Disposition	Custody Date
0041376-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-02	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-02	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-03	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-03	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-04	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-04	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-05	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-05	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-06	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-06	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-07	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-07	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-08	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-08	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05

Relinquished By _____ Date _____ Received By _____ Date _____

Relinquished By _____ Date _____ Received By _____ Date _____

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: McCoy & McCoy Project # # 30358430

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label BLM
LIMS Login BLM

Tracking #: 110733861178

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 5.1 °c Correction Factor: -0.4 °c Final Temp: 4.7 °c

Temp should be above freezing to 6°C

pH paper Lot# 10D0391 Date and Initials of person examining contents: NMR 4/10/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date & time on labels
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. added 5.0mL HNO_3 to each sample
All containers meet method preservation requirements.		✓		Initial when completed: NMR Date/time of preservation: 4/10/2020 1610
				Lot # of added preservative: DL20-0362
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 4/10/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Maneger closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Appendix E
Remedy Selection Evaluation Criteria

TABLE E-1. Summary of Evaluation Criteria
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative			
		Alt 2a	Alt 3	Alt 4	Alt 5
	Threshold Criteria				
(b)(1)	Be protective of human health and the environment	1	3	3	3
(b)(2)	Attain the Groundwater Protection Standards	1	3.5	2	3.5
(b)(3)	Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents into the environment	1	3	2	4
(b)(4)	Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems	1	3	2	4
(b)(5)	Comply with standards for management of wastes as specified in Section 257.98(d)	2.5	2.5	2.5	2.5
	Balancing Criteria				
(c)(1)	The long and short-term effectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on a consideration of the following:				
(c)(1)(i)	Magnitude of reduction of existing risks	1	4	3	2
(c)(1)(ii)	Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy	1	3.5	3.5	2
(c)(1)(iii)	The type and degree of long-term management required, including monitoring, operation, and maintenance	1	2.5	2.5	4
(c)(1)(iv)	Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant	1	3	2	4
(c)(1)(v)	Time until full protection is achieved	1	3	2	4
(c)(1)(vi)	Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment;	1	3	2	4
(c)(1)(vii)	Long-term reliability of the engineering and institutional controls	1	3	2	4
(c)(1)(viii)	Potential need for replacement of the remedy	4	2	1	3
(c)(2)	The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:				
(c)(2)(i)	The extent to which containment practices will reduce further releases	1	3	2	4
(c)(2)(ii)	The extent to which treatment technologies may be used	1	4	3	2
(c)(3)	The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors				
(c)(3)(i)	Degree of difficulty associated with constructing the technology	4	2	1	3
(c)(3)(ii)	Expected operational reliability of the technologies	4	2	1	3
(c)(3)(iii)	Need to coordinate with and obtain necessary approvals and permits from other agencies	2.5	2.5	2.5	2.5
(c)(3)(iv)	Availability of necessary equipment and specialists	4	2	1	3
(c)(3)(v)	Available capacity and location of needed treatment, storage, and disposal services	1	2	3	4
	Modifying Criteria				
(c)(4)	The degree to which community concerns are addressed by a potential remedy(s)				
NA (Agreed Order)	State Acceptance	1	3.5	3.5	2
(c)(4)	Community Acceptance	1	3.5	3.5	2
	Total Score =	**37**	**63.5**	**50**	**69.5**

TABLE E-2. Threshold Criteria Evaluation
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative				Benefit Analysis
		Alt 2a	Alt 3	Alt 4	Alt 5	
Threshold Criteria						
(b)(1)	Be protective of human health and the environment (HH&E)	1	3	3	3	All 4 alternatives are expected to be protective of HH&E. **Alt 2a** is considered to be the minimum corrective action that would be required to achieve the CAOs, with the other 3 alternatives building to some degree upon Alt 2a. However Alt 2a relies upon natural attenuation to achieve and ultimately meet the CAOs and therefore has been scored lower for this criteria. The other 3 alternatives are expected to be protective of HH&E to the same degree and have been scored equally.
(b)(2)	Attain the Groundwater Protection Standards (GWPS)	1	3.5	2	3.5	All 4 alternatives are expected to meet the GWPS, however the time frame for attainment is expected to vary based upon the degree to which the alternative employs an active component and how long the active component will take to design and implement. **Alt 2a** employs no active remedial component and has been scored lowest. Implementation of other source control measures (included with Alt 3 and Alt 5) is viewed as the corrective measure likely to provide a benefit in the shortest time frame. Addition of hydraulic/physical containment technologies combined with ex-situ treatment associated with **Alt 3** and **Alt 4** will required additional engineering and pilot testing, likely extending the time required for implementation. **Alt 4** would require enhanced engineering and testing compared to **Alt 3** so it was ranked lower than **Alt 3**. The **Alt 3** and **Alt 5** alternatives are likely to attain the GWPS in the shortest time frame and have been scored highest.
(b)(3)	Control the source(s) of releases so as to reduce or eliminate, to the maximum extent feasible, further releases of Appendix IV constituents into the environment	1	3	2	4	All 4 alternatives are expected to reduce or eliminate further releases of Appendix IV constituents. Alt 2a is considered to be the minimum corrective action that would be required to achieve the CAOs, with the other 3 alternatives building to some degree upon Alt 2a. However Alt 2a relies upon natural attenuation to achieve ultimately meet the CAOs and therefore has been scored lowest for this criteria. Alt 3 and Alt 4 incorporate active remedial components to remove COCs from the environment. Given that Alt 3 and Alt 4 incorporate an ex-situ component, both represent slightly higher potential for furthers releases into the environment compared with Alt 5. Given that Alt 3 contains a source control component it scores higher than Alt 4. Alt 5 will prevent further releases by removing source material from the South Sediment Basin and is not seen to represent as much of a environmental risk via a release to surface water receptors as Alt 3 and Alt 4.
(b)(4)	Remove from the environment as much of the contaminated material that was released from the CCR unit as is feasible, taking into account factors such as avoiding inappropriate disturbance of sensitive ecosystems	1	3	2	4	All 4 alternatives are expected to remove contamination from the environment. Alt 2a employs no active remedial component and has been scored lowest of all. Both Alt 3 and Alt 4 incorporate an active remedial component to remove COCs from the environment, but incorporate engineering and ex-situ components, representing a slight probability of impacting sensitive ecosystems and have been scored lower compared to Alt 5. Both Alt 3 and Alt 5 incorporate removing source material from the South Sediment Basin and other source control measures, in addition to addressing groundwater impacts. Due to the lack of an ex-situ component, Alt 5 has been scored highest of all.
(b)(5)	Comply with standards for management of wastes as specified in Section 257.98(d) [See Notes]	2.5	2.5	2.5	2.5	All 4 alternatives are expected to comply with waste management standards to the same degree and have been scored equally.
	SUBTOTALS	**6.5**	**15**	**11.5**	**17**	

notes:

1) Alternative #2a (A2a): CiP, ICs, and Groundwater Monitoring
2) Alternative #3 (A3): CiP, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring
3) Alternative #4 (A4): CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
4) Alternative #5 (A5): CiP, Other Source Control, ICs, and Groundwater Monitoring
5) Ranking scores range from 1 to 4; 1 = lowest ranking score; 4 = highest ranking score
6) When alternatives are all equivalent the ranking is assigned as the average value of all possible ranking (i.e., (1+2+3+4)/4 = 2.5)

TABLE E-3. Balancing Criteria Evaluation
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative Alt 2a	Alt 3	Alt 4	Alt 5	Benefit Analysis
	Balancing Criteria					
(c)(1)	The long and short-term effectiveness of the potential remedy(s), along with the degree of certainty that the remedy will prove successful based on a consideration of the following:					
(c)(1)(i)	Magnitude of reduction of existing risks	1	4	3	2	All 4 alternatives are expected to result in a reduction of existing risks. Alt 2a is considered to be the minimum corrective action that would be required to achieve the CAOs, with the other 3 alternatives building to some degree upon Alt 2a. However Alt 2a relies upon natural attenuation to ultimately achieve the CAOs and therefore has been scored lowest for this criteria. Alt 3 and Alt 4 incorporate an active remedial component to remove COCs from the environment, which is considered to be effective at reducing existing risks. Given that Alt 4 incorporates an ex-situ component, it does represent slightly higher existing risk than Alt 3. Alt 5 on itis own provides for some reduction of existing risks by removing source material from the South Sediment Basin, but scores lower than Alt 3 and Alt 4.
(c)(1)(ii)	Magnitude of residual risks in terms of likelihood of further releases due to CCR remaining following implementation of a remedy [See Note]	1	3.5	3.5	2	All 4 alternatives are expected to result in a reduction of residual risks due to further releases but allow for CCR to remain in place indefinitely. **Alt 2a** employs no active component for containing further releases and has been scored lowest of all. **Alt 3** will reduce further releases due to the hydraulic containment provided by a groundwater extraction system and the ability of treatment to remove COCs from the environment. **Alt 4** will reduce further releases due to the implementation of physical containment and treatment of groundwater to remove COCs from the environment. **Alt 5** would also reduce further releases to the environment, but due to the uncertainty with regard to the impacts observed at MW-3A scored slightly lower. **Alt 3** and **Alt 4** are considered to be equal with regard to this criteria.
(c)(1)(iii)	The type and degree of long-term management required, including monitoring, operation, and maintenance [See Note]	1	2.5	2.5	4	**Alt 2a** will only achieve the established CAO at the end of the Unit operational lifecycle after cap construction, which estimated to be at least 100 years after CiP construction. As a result, **Alt 2a** will require the most long-term management and has been scored lowest of all. Although the source control component included with **Alt 5** will require some longer term maintenance, both **Alt 3** and **Alt 4** incorporate treatment components requiring considerable expenditure of resources and energy during construction, implementation, and long-term operation. Therefore, **Alt 5** has been scored highest of all the alternatives. **Alt 3** and **Alt 4** are considered to be equal with regard to this criteria.
(c)(1)(iv)	Short-term risks that might be posed to the community or the environment during implementation of such a remedy, including potential threats to human health and the environment associated with excavation, transportation, and re-disposal of contaminant	1	3	2	4	All 4 alternatives contain some level of short-term risk. Alt 2a employs no active remedial component and has been scored lowest of all. Given that Alt 3 and Alt 4 incorporate an ex-situ component, both represent slightly higher potential for furthes releases into the environment compared with Alt 5. Given that Alt 3 contains a source control component it scores higher than Alt 4. Alt 5 does require removing source material from the South Sediment Basin but is not seen to represent as much risk to the environment during excavation compared to Alt 3 and Alt 4.
(c)(1)(v)	Time until full protection is achieved	1	3	2	4	Alt 2a will achieve the established CAO at the end of the Unit operational lifecycle after cap construction, which would hault source loading to groundwater, and further allow unimpacted groundwater to flush through the aquifer. The time period for attainment of Alt 2a is estimated to be at least 100 years after CiP construction. Alt 3 would attain the established CAO for the Unit after hydraulic containment eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. The time period for attainment is relatively short (i.e., <30 years). In the long term, Alt 3 will maintain compliance with the established CAO after cap construction at the end of the Unit operational lifecycle, and removing sourcce material of the South Sediment Basin which will end the source loading to groundwater, as unimpacted groundwater flushes through the aquifer. Alt 4 would attain the established CAO for the landfill after physical containment and extraction eliminates the offsite migration of impacted groundwater, thereby eliminating the exposure pathway. The time period for attainment is based on construction of the grout curtain and groundwater extraction system and is expected to be protracted. In the long term, Alt 4 will maintain compliance with the established CAO after cap construction at the end of the Unit operational lifecycle, which will end the source loading to the groundwater, as unimpacted groundwater flushes through the aquifer. Alt 5 would attain the established CAO for the Unit after removing sourcce material from the South Sediment Basin which will end the source loading to groundwater, as unimpacted groundwater flushes through the aquifer, thereby eliminating the exposure pathway. The time period for attainment via Alt 5 is relatively short. In the long term, Alt 5 will maintain compliance with the established CAO after cap construction at the end of the Unit operational lifecycle. Alt 5 has been scored higher than Alt 3, as design of the source control measures is underway as required by the AO.

TABLE E-3. Balancing Criteria Evaluation
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative Alt 2a	Alt 3	Alt 4	Alt 5	Benefit Analysis
Balancing Criteria						
(c)(1)(vi)	Potential for exposure of humans and environmental receptors to remaining wastes, considering the potential threat to human health and the environment associated with excavation, transportation, re-disposal, or containment;	1	3	2	4	All 4 alternatives allow for CCR to remain in place indefinitely. Alt 2a employs no active remedial component and has been scored lowest of all. Given that Alt 3 and Alt 4 incorporate an ex-situ component, both represent slightly higher potential for furthers releases into the environment compared with Alt 5. Given that Alt 3 contains a source control component it scores higher than Alt 4. Alt 5 does require removing source material from the South Sediment Basin but is not seen to represent as much risk to the environment during excavation compared to Alt 3 and Alt 4.
(c)(1)(vii)	Long-term reliability of the engineering and institutional controls	1	3	2	4	All 4 alternatives incorporate institutional controls. **Alt 2a** is considered to be the minimum corrective action that would be required to achieve the CAOs, relying upon natural attenuation to achieve ultimately meet the CAOs and therefore has been scored lowest for this criteria. Given that **Alt 3 and Alt 4** incorporate an engineering component, both represent slightly higher reliability concerns compared with **Alt 5**. Given that **Alt 3** contains a source control component it scores higher than **Alt 4**.
(c)(1)(viii)	Potential need for replacement of the remedy	4	2	1	3	With the exception of **Alt 2a**, each alternative employs treatment technologies. **Alt 2a** employs no active remedial component requiring replacement, and has been scored highest of all. Both **Alt 3** and **Alt 4** incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored lower than **Alt 5**. **Alt 3** incorporates source control measures, and has been scored higher than **Alt 4**.
(c)(2)	The effectiveness of the remedy in controlling the source to reduce further releases based on consideration of the following factors:					
(c)(2)(i)	The extent to which containment practices will reduce further releases	1	3	2	4	All 4 alternatives are expected to reduce or eliminate further releases of Appendix IV constituents. Alt 2a is considered to be the minimum corrective action that would be required to achieve the CAOs, with the other 3 alternatives building to some degree upon Alt 2a. However Alt 2a relies upon natural attenuation to achieve ultimately meet the CAOs and therefore has been scored lowest for this criteria. Alt 3 and Alt 4 incorporate active remedial components to remove COCs from the environment. Given that Alt 3 and Alt 4 incorporate an Ex-Situ component, both represent slightly higher potential for furthers releases into the environment than Alt 5. Given that Alt 3 contains a source control component it scores higher than Alt 4. Alt 5 will prevent further releases by removing source material from the South Sediment Basin and is not seen to represent as much risk to the environment as Alt 3 and Alt 4.
(c)(2)(ii)	The extent to which treatment technologies may be used	1	4	3	2	With the exception of **Alt 2a**, each alternative employs treatment technologies. **Alt 2a** employs no active remedial component and has been scored lowest of all. Both **Alt 3** and **Alt 4** incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored higher than **Alt 5**. **Alt 3** incorporates source control measures, and has been scored highest of all.
(c)(3)	The ease or difficulty of implementing a potential remedy(s) based on consideration of the following types of factors					
(c)(3)(i)	Degree of difficulty associated with constructing the technology	4	2	1	3	With the exception of Alt 2a, each alternative employs treatment technologies. Alt 2a employs no active remedial component and has been scored highest of all. Alt 3 would pose some challenges to the installation and operation of the extraction wells. The proximity to the river will require substantially higher extraction rates in order to provide hydraulic containment. The proximity to the river may pose accessibility issues and result in inflated costs. Alt 4 would be very difficult to implement and is expected to pose some challenges with respect to the installation of the grout curtain and extraction system along the perimeter of the Landfill. The proximity to the river may pose accessibility issues and result in inflated costs. Trenching equipment may be able to meet the depth required for an effective Physical Containment barrier. Alt 4 has been scored lowest of all options with regard to the criteria. Draining and lining the South Sediment Basin requires nominal engineering and construction efforts. Both Alt 3 and Alt 4 incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored lower than Alt 5.
(c)(3)(ii)	Expected operational reliability of the technologies	4	2	1	3	With the exception of **Alt 2a**, each alternative employs treatment technologies. **Alt 2a** employs no active remedial component requiring operation, and has been scored highest of all. Both **Alt 3** and **Alt 4** incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored lower than **Alt 5**. **Alt 3** incorporates source control measures, and has been scored higher than **Alt 4**.
(c)(3)(iii)	Need to coordinate with and obtain necessary approvals and permits from other agencies [See Note]	2.5	2.5	2.5	2.5	All 4 alternatives are expected to require permitting and approval from KDWM to the same degree and have been scored equally.

TABLE E-3. Balancing Criteria Evaluation
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative Alt 2a	Alt 3	Alt 4	Alt 5	Benefit Analysis
Balancing Criteria						
(c)(3)(iv)	Availability of necessary equipment and specialists	4	2	1	3	With the exception of **Alt 2a**, each alternative employs treatment technologies. **Alt 2a** employs no active remedial component requiring operation, and has been scored highest of all. Both **Alt 3** and **Alt 4** incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored lower than **Alt 5**. **Alt 4** would be very difficult to implement and is expected to pose some challenges with respect to the installation of the grout curtain and extraction system along the perimeter of the Landfill. **Alt 4** is expected to require the most equipment and specialists and has been scored lowest of all.
(c)(3)(v)	Available capacity and location of needed treatment, storage, and disposal services	1	2	3	4	With the exception of **Alt 2a**, each alternative employs treatment technologies. **Alt 2a** employs no active remedial component requiring operation, and has been scored lowest of all. Both **Alt 3** and **Alt 4** incorporate an active remedial component to remove COCs from the environment, including engineering and ex-situ components, and have been scored lower than **Alt 5** due to the need for treatment. **Alt 3** is expected to require the most treatment requirements and has been scored lower than **Alt 4**.
	SUBTOTALS	**28.5**	**41.5**	**31.5**	**48.5**	

notes:

1) Alternative #2a (A2a): CiP, ICs, and Groundwater Monitoring
2) Alternative #3 (A3): CiP, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring
3) Alternative #4 (A4): CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
4) Alternative #5 (A5): CiP, Other Source Control, ICs, and Groundwater Monitoring
5) Ranking scores range from 1 to 4; 1 = lowest ranking score; 4 = highest ranking score
6) When alternatives are all equivalent the ranking is assigned as the average value of all possible ranking (i.e., (1+2+3+4)/4 = 2.5)

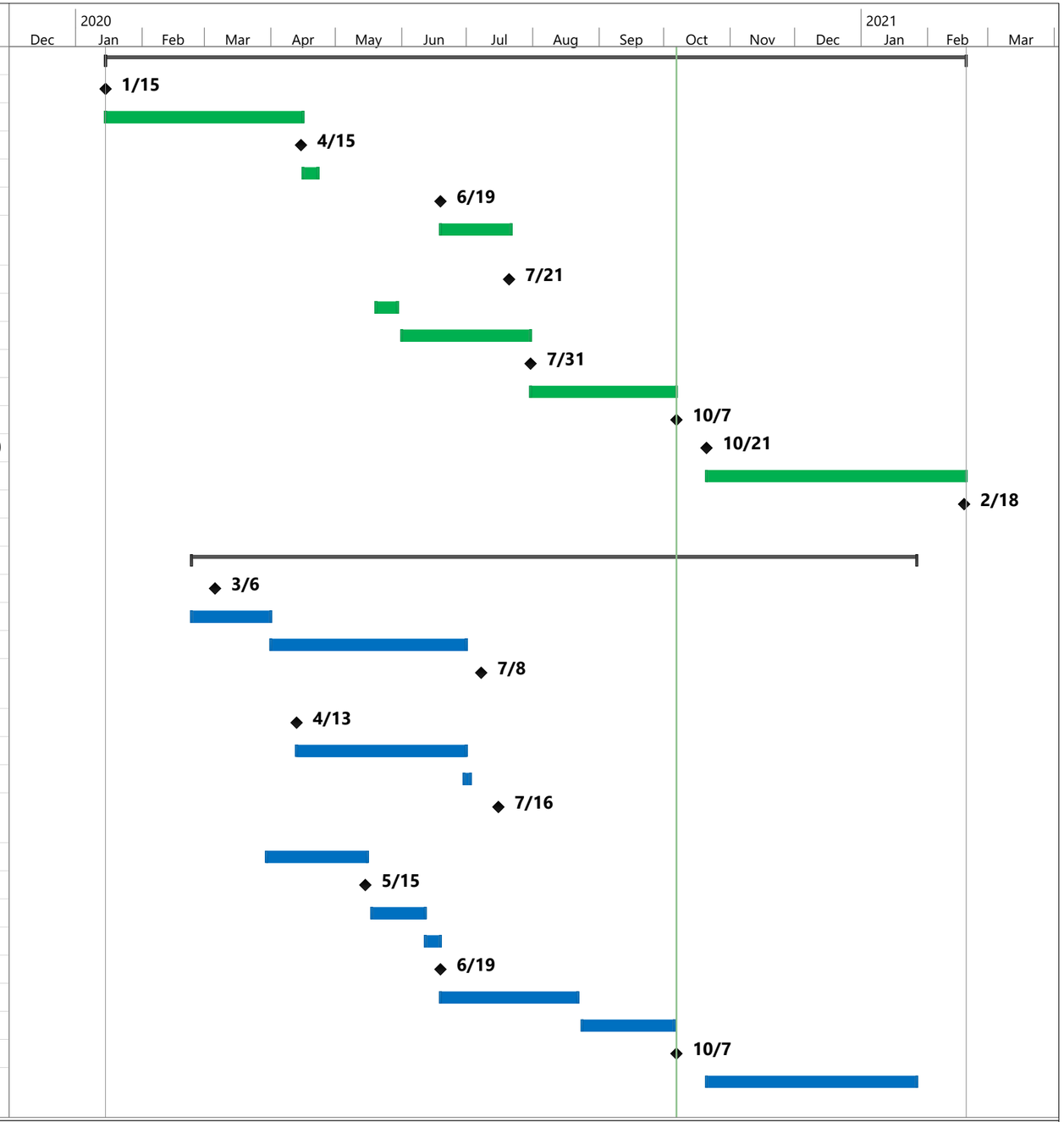
TABLE E-4. Modifying Criteria Evaluation
Groundwater Remedy Selection
Big Rivers Electric Corporation - Green Landfill

40 CFR 257.97 Reference	Corrective Measure Evaluation Criteria under 40 CFR 257.97	Corrective Measure Alternative Alt 2a	Alt 3	Alt 4	Alt 5	Benefit Analysis
Modifying Criteria						
(c)(4)	The degree to which community concerns are addressed by a potential remedy(s)					
NA (Agreed Order)	State Acceptance [See Notes]	1	3.5	3.5	2	**Alt 2a** is expected to be met with limited state acceptance due to the protracted remedy time frame. **Alt 3** and **Alt 4** will both minimize the potential impacts to the receptors upon implementation of the extraction system, and the potential for permitting would be relatively straightforward following the completion of the design, thus increasing the regulatory acceptance of the overall remedy. **Alt 5** is expected to receive moderate acceptance from the state with respect to additional control of other potential sources of groundwater contamination.
(c)(4)	Community Acceptance [See Notes]	1	3.5	3.5	2	**Alt 2a** is expected to be met with limited community acceptance due to the protracted remedy time frame. **Alt 3** leaves waste in place but provides for active, short-term effective measures that would likely meet with moderate acceptance from the community. **Alt 4** would likely meet with moderate acceptance from the community with respect to the established CAO and the addition of the grout curtain and extraction system; however, the remedy timeframe and the discharge of treated groundwater may be an issue. **Alt 5** would potentially meet with limited acceptance from the community due to the remedy time frame, which will be complete only after completion of the Landfill's operational lifecycle. However **Alt 5** is expected to be more acceptable to the community compared to **Alt 2a** due to the inclusion of an active corrective measure component.
	SUBTOTALS	**2**	**7**	**7**	**4**	

notes:
1) Alternative #2a (A2a): CiP, ICs, and Groundwater Monitoring
2) Alternative #3 (A3): CiP, Hydraulic Containment, Other Source Control (consisting of seepage collection and treatment), Ex-Situ Treatment, ICs, and Groundwater Monitoring
3) Alternative #4 (A4): CiP, Physical Containment, Ex-Situ Treatment, ICs, and Groundwater Monitoring
4) Alternative #5 (A5): CiP, Other Source Control, ICs, and Groundwater Monitoring
5) Ranking scores range from 1 to 4; 1 = lowest ranking score; 4 = highest ranking score
6) When alternatives are all equivalent the ranking is assigned as the average value of all possible ranking (i.e., (1+2+3+4)/4 = 2.5)

Appendix F
Remedy Implementation Schedule

ID	Task Mode	Task Name	Start	Finish
1		**Green Landfill - Perimeter Seepage Control Design**	**Wed 1/15/20**	**Thu 2/18/21**
2		AEC-000: Purchase Order Received by AECOM	Wed 1/15/20	Wed 1/15/20
3		AEC-010: Develop 60% Civil Design	Wed 1/15/20	Wed 4/15/20
4		AEC-40: Submit 60% Draft Civil Design and Specifications	Wed 4/15/20	Wed 4/15/20
5		CLI-10: Client Review of 60% Civil Design	Thu 4/16/20	Wed 4/22/20
6		AEC-020: Submit Perimeter Seepage Design to Agency	Fri 6/19/20	Fri 6/19/20
7		AEC-30: Develop 90% Draft Civil Design and Specifications	Fri 6/19/20	Tue 7/21/20
8		AEC-40: Submit 90% Draft Civil Design and Specifications	Tue 7/21/20	Tue 7/21/20
9		CLI-020: Prepare Bid Documents	Wed 5/20/20	Fri 5/29/20
10		CLI-030: Bid Period	Mon 6/1/20	Thu 7/30/20
11		CLI-040: Bids Due	Fri 7/31/20	Fri 7/31/20
12		CLI-050: Negotiate Award	Fri 7/31/20	Tue 10/6/20
13		CLI-060: Award Contract	Wed 10/7/20	Wed 10/7/20
14		CLI-070: Construction Start	Wed 10/21/20	Wed 10/21/20
15		CLI-080: Construction	Wed 10/21/20	Thu 2/18/21
16		CLI-090: Construction Complete	Thu 2/18/21	Thu 2/18/21
17				
18		**Green Landfill - Groundwater Remedy Selection**	**Mon 2/24/20**	**Tue 1/26/21**
19		1: Receive Big Rivers concurrence on tasks/schedule	Fri 3/6/20	Fri 3/6/20
20		2: Data Gap Evaluation	Mon 2/24/20	Tue 3/31/20
21		3: Preparation for Public Meeting	Wed 4/1/20	Tue 6/30/20
22		4: Notice for Public Meeting in local newspaper and on BREC CCR website	Wed 7/8/20	Wed 7/8/20
23		5: Submit PowerPoint Presentation for client review	Mon 4/13/20	Mon 4/13/20
24		6: Client review of PowerPoint Presentation	Mon 4/13/20	Tue 6/30/20
25		7: Revise PowerPoint Presentation	Tue 6/30/20	Thu 7/2/20
26		8: Public Meeting to present ACM results (40 CFR 257.96(e))	Thu 7/16/20	Thu 7/16/20
27		9: Develop Final Remedy Selection Report (FRSR)	Mon 3/30/20	Fri 5/15/20
28		10: Submit FRSR for client review	Fri 5/15/20	Fri 5/15/20
29		11: Client review of FRSR	Mon 5/18/20	Thu 6/11/20
30		12: Incorporate client comments in FRSR	Fri 6/12/20	Thu 6/18/20
31		13: Submit FRSR for KDEP Review	Fri 6/19/20	Fri 6/19/20
32		14: KDEP Review of FRSR	Fri 6/19/20	Fri 8/21/20
33		15: Address KDEP comments on FRSR	Mon 8/24/20	Mon 10/5/20
34		16: Post Final FRSR to CCR Website	Wed 10/7/20	Wed 10/7/20
35		17: Groundwater Remedy Implementation (within 90 days of selecting a remedy under 40 CFR 257.97)	Wed 10/21/20	Tue 1/26/21



Project: Green LF_Peri Seep+GW
Date: Wed 10/7/20

Task	Project Summary	Manual Task	Start-only	Deadline
Split	Inactive Task	Duration-only	Finish-only	Progress
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress
Summary	Inactive Summary	Manual Summary	External Milestone	

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Appendix B
Green Landfill Analytical Summary Tables

GREEN LANDFILL - CCR ANALYTICAL SUMMARY
MW-1

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																													
			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		9/28/2018		4/22/2019		9/30/2019		4/6/2020		9/22/2020	
			Baseline Events																		Assessment		Re-Sampling		Assessment								
Boron	0.08		1.67		1.49		2.25		1.70		1.71	J	1.68		1.85	B	1.79		1.92				1.41		1.94	B	1.73	B	1.68	D2 M4	1.69	D1, M3	1.66	D2, M4
Calcium	0.5		29.1		31.8	B	33.0		30.9		20.8		28.1		27.1		29.9	B	26.4				26.5		28.5	B	32.1		29.1	D2	27.7	D1, M3	26.4	D2
Chloride	3		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			6.34	B	6.17	B	6.41	B F1	7.5		6.5		6.6	
Fluoride	1		ND	J	ND	JB	ND	J	ND	JB	ND	J F1	ND	JB	ND	J F1	ND	J	ND	J F1			ND	J	ND	JB	0.521	J	0.6		0.5		0.6	
Sulfate	5		25.2		22.8	JB	22.9		20.7	B	28.4		24.0	B	25.3	B	23.4		24.9	JB			23.5		22.5	B	35.1	B F1	19		21		24	
pH (SU)	0.10		7.39		7.24		7.57		7.19		7.63		7.54		7.45		7.48		7.63				7.08		8.43		7.87		7.79	H3	7.22		6.88	
Total Dissolved Solids	10		598		588		585		585		605		630		614		627		636				585		616		568	B	444	H1	488		388	
APPENDIX IV CONSTITUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	B	ND		ND		ND	JB	0.00297	B	ND	JB			ND	JB	ND	J	NA		0.000254	JB	ND	M1 V1 U	<0.005		<0.005	
Arsenic	0.005	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	ND	JB	0.00167	JB	0.0005	V1 J	0.0019		<0.0010	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J F1	ND	J			ND	JB	ND	J	ND	J	0.0862	J	0.091	D2	0.087		0.077	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000533	J	ND	D2 U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000299	J	ND	VI U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND		NA		0.00354	B	ND	U	0.0011	J	<0.0020	
Cobalt	0.005	0.006 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J	NA		0.000571	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J F1	ND	JB	ND	J F1	ND	J			ND	J	ND	J	ND	JB	0.521	J	0.6		0.5		0.6	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND	J	ND		ND		ND		ND		ND	J			ND		ND	J	NA		0.000279	J	ND	V1 U	<0.002		<0.002	
Lithium	0.05	0.040 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	0.0279	J	0.0295	J	ND	D2 M3 U	0.03		<0.20	M1
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND				ND	J	ND	J	NA		0.00105	J	ND	U	<0.01		<0.01	
Radium 226	1	5 pCi/L	1.05		1.02		0.676		1.02		0.694		0.666		0.491		0.601				1.92		0.882		0.905		0.689		0.782		0.808		0.564	
Radium 228																													0.733					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND	J	ND				ND		ND		NA		0.00105	J	ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND	J	ND		ND		ND	J	ND				ND		ND		NA		0.000498	J	0.0001	V1 J	0.0001	J	0.0001	J

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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-2

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/28/2018		4/23/2019		10/1/2019		4/7/2020		9/22/2020	
			Baseline Events																		Assessment		Re-Sampling		Assessment								
Boron	0.08		ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	0.113	JB	ND	JB	ND	J			ND	J	0.0630	JB	0.101	JB	ND	D2 U	<0.10		<0.10	
Calcium	0.5		119		116	B	140		140	B	126		152		154		121		150				155		165	B	156		166	D1	145	D1	157	D1
Chloride	3		126	B	125	B	129	B	133		142	B	129	B	145	B	136	B	129	B			154	B	159	B	144		108	D	120	D	231	D
Fluoride	1		ND	J	ND		ND	J	ND	JB F1	ND	J	ND	JB	ND	JB	ND	JB F1	ND	J			ND	J	ND	JB	0.193	J	0.3		0.2		0.3	
Sulfate	5		80.0		84.5	J	85.5	J	90.1		89.8		83.2		92.0	JB	90.8		88.6	JB			107		108	B	105		79.0	D	85	D	117	D
pH (SU)	0.10		6.81		6.59		6.7		6.78		7.12		7.04		6.77		6.69		6.86		6.64		6.40		7.02		7.15		7.39	H3	6.92		6.22	
Total Dissolved Solids	10		764		780		830		880		862		918		913		818		970				884		937		918	B	930	H1	806		914	
APPENDIX IV CONSTITUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND	JB	ND		ND	JB	ND	B	ND	JB			ND	JB	ND	J	NA		0.0000670	JB	ND	V1 U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	0.00703	J	0.00633		0.0110		0.0159		0.0462		0.00755		0.0381		0.00527				0.0327	B	0.0119		0.0211	B	0.00738	B	0.0129	D2	0.0033		0.0095	
Barium	0.2	2 mg/L	ND	J	ND	J	0.280		0.319		0.347		0.332		0.308		ND	J			0.369		0.323		0.367		0.362		0.380	D2	0.238		0.336	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		0.000281	J	ND	D2 U	<0.0020		<0.0020	
Cadmium	0.001	0.005 mg/L	ND	J	ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND		NA		0.00122	JB	ND	D2 U	<0.0020		<0.0020	
Cobalt	0.005	0.006 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J			ND	JB	ND	J	NA		0.00382	J	ND	D2 U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND		ND	J	ND	JB F1	ND	J	ND	JB	ND	JB	ND	JB F1			ND	J	ND	J	ND	JB	0.193	J	0.3		0.2		0.3	
Lead	0.005	0.015 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	ND	J	ND		ND		ND		ND	J	ND	J	ND	JB	ND				ND		ND		ND		ND		ND	D2 VI U	0.007	J	0.006	V1, J
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	JB			ND	J	ND	J	NA		0.00210	J	0.003	J	0.002	J	0.002	J
Radium 226	1	5 pCi/L	0.533		ND		0.46		ND		0.856		0.73		0.968		0.537				1.18		0.733		0.803		0.391		0.136		0.529		0.493	
Radium 228																													0.834					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND	JB	ND		ND		ND	JB	ND				ND		ND		NA		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		0.0000800	J	ND	V1 U	<0.0020		<0.0020	

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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-3A

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																					
			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																		Assessment		Re-Sampling	
Boron	0.08		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				0.177	J
Calcium	0.5		431		322	B	362		365	B	327		420		421		438	B	408				469	
Chloride	3		2630	HB	3070		2150	B	2150	B	2220	B	2120	B	1790	B	2270	B	1870	B			2180	B
Fluoride	1		ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		3.16		ND	J			ND	J
Sulfate	5		1330		1330		1190		1660		1080		1030	B	942		1130		1030	B			1010	
pH (SU)	0.10		6.92		6.86		6.95		6.75		7.17		7.11		6.81		6.9		6.95		6.84		6.55	
Total Dissolved Solids	10		4440		5010		4170		4450		4270		5170		5010		5020		5300				4540	
APPENDIX IV CONSTITUENTS																								
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB			ND	JB	ND	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND	
Cadmium	0.001	0.005 mg/L	ND	J	ND	J	ND		ND		ND	J	ND	J	ND		ND				ND	J	ND	J
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND	
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		3.16				ND	J	ND	J
Lead	0.005	0.015 mg/L	ND	J	ND		ND		ND		ND		ND		ND	J	ND	J			ND		ND	J
Lithium	0.05	0.040 mg/L	0.669		0.516		0.648		0.677		0.689		0.746		0.767		0.762				0.699		0.790	
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND	
Molybdenum	0.01	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND	
Radium 226	1	5 pCi/L	1.38		0.386		0.472		1.15		1.15		0.923		1.53		1.03				1.18		1.43	
Radium 228																								
Selenium	0.01	0.05 mg/L	ND		ND		ND	J	ND	JB	ND		ND		ND		ND				ND	J	ND	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND		ND	

APPENDIX III CONSTITUENTS	9/28/2018		4/23/2019		10/1/2019		4/7/2020		9/22/2020	
	Assessment									
Boron	0.257	JB	0.259	JB	ND	D2 U	0.26		0.28	
Calcium	447	B	411		490	D1	425	D1	423	D1
Chloride	2040	B	1850		4570	D	3220	D	1200	D
Fluoride	ND	JB	0.387	J	0.4		0.5		0.4	
Sulfate	1130	B	1080		1680	D	1840	D	1830	D
pH (SU)	7.98		7.23		7.33	H3	6.86		6.61	
Total Dissolved Solids	4940		4250	B	6900	H1	5860		5680	
APPENDIX IV CONSTITUENTS										
Antimony	NA		0.000102	JB	ND	V1 U	<0.005		<0.005	
Arsenic	ND	JB	0.000575	JB	ND	D2 U	<0.0010		<0.0010	
Barium	ND	J	0.0474	J	0.051	D2 U	0.042		0.043	
Beryllium	NA		0.000199	J	ND	D2 U	<0.0020		<0.0020	
Cadmium	NA		0.000164	J	ND	V1 U	0.0001	J	<0.0010	
Chromium	NA		0.00168	JB	ND	D2 U	<0.0020		0.0006	J
Cobalt	NA		0.000243	J	0.008		<0.004		0.004	
Fluoride	ND	JB	0.387	J	0.4		0.5		0.4	
Lead	NA		0.000137	J	ND	V1 U	<0.002		<0.002	
Lithium	0.766		0.678		0.79	D1	0.68		0.80	D2
Mercury	ND		ND		ND	V1 U	<0.0005		<0.0005	
Molybdenum	NA		ND		ND	D2 U	<0.01		<0.01	
Radium 226	1.21		0.641		0.139		1.06		1.51	
Radium 228					0.734					
Selenium	NA		0.00103	J	ND	D2 U	<0.003		<0.003	
Thallium	NA		0.000860	J	ND	V1 U	<0.0020		<0.0020	

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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-4

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/28/2018		4/22/2019		10/1/2019		4/7/2020		9/22/2020	
			Baseline Events																		Assessment		Re-Sampling		Assessment								
Boron	0.08		0.602		0.498	J	1.58		1.7		1.54	B	2.09		2.51	B	2.87	B	1.36				0.751	J	1.33	B	1.25	B	1.75	D2	0.83		1.70	D2
Calcium	0.5		660		386	B	464		558		591		774		743		739		828				822		722	B	730		690	D1	464	D1	823	D1
Chloride	3		1450	B	939	B	952	B	1000	B	1420	B	1320	B	1360	B	1880	B	1730	B			1430	B	1310	B	1510		1910	D	1560	D	2030	D
Fluoride	1		ND	J	ND		ND	J	ND	JB	ND	J	1.06	B	ND		ND	JB	ND	J			ND	J	ND	JB	0.102	J	0.2		0.2		0.2	
Sulfate	5		1830		1640		1420		1420	B	1620		1430	B	1600	B	2020		1590	B			1460		1400	B	1440		2490	D	4000	D	2080	D
pH (SU)	0.10		6.36		6.83		7.08		6.61		7.28		7.1		6.84		6.64		6.93		6.86		6.58		8.06		7.26		7.36	H3	6.70		6.64	
Total Dissolved Solids	10		3700		4250		3440		3250		4420		4550		4890		4700	H	6220				4880		5170		4840	B	4820	H1	5120		4470	
APPENDIX IV CONSTITUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND		ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.0000360	JB	ND	V1 U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND		ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000445	JB	ND	D2 U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	J	ND	JB			ND	J	ND	J	ND	J	0.0308	JB	0.029	D2 J	0.022		0.031	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U	<0.0020		<0.0040	D2
Cadmium	0.001	0.005 mg/L	ND	J	ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND		NA		0.00110	JB	ND	D2 U	0.0008	J	<0.0020	
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND	JB	ND	J	NA		0.000415	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND		ND		ND	J	ND	JB	ND	J	ND	B	ND		ND	JB			ND	J	ND	J	ND	JB	0.102	J	0.2		0.2		0.2	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	1.39		0.838		1.13		1.25		1.35		1.59		1.77		1.66				1.81		1.91		1.81		1.73		ND	D2 V1 U	0.82		1.73	D2
Mercury	0.0002	0.002 mg/L	0.00027		0.000224		ND	J	0.000248		0.000302		0.000717		0.000825		0.000485				0.000824		0.000832		0.000680		0.000825		0.0004	V1 J	0.0003	J	0.0003	J
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND		ND		ND	J	ND		ND		ND				ND		ND		NA		ND		ND	D2 U	0.002	J	<0.01	
Radium 226	1	5 pCi/L	1.26		0.592		ND		0.536		1.22		1.43		1.94		1.19				1.62		2.00		1.51		1.66		0.451		1.26		0.877	
Radium 228																													0.804					
Selenium	0.01	0.05 mg/L	ND	J	ND	J	ND	J	ND		ND	J	ND		ND		ND	J			ND	J	ND		NA		0.00211	J	ND	U	0.023		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		ND		NA		0.0000410	J	ND	V1 U	<0.0020		<0.0020	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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-5

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																									
			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		9/28/2018		4/22/2019		9/30/2019		4/7/2020		9/22/2020	
			Baseline Events																		Assessment		Re-Sampling		Assessment							
Boron	0.08		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				0.207	J	0.263	JB	0.271	JB	ND	D2 U	0.25		0.24	
Calcium	0.5		452		189	B	374		399		335		464		423		407	B	383				469		441	B	446		476	D1	464	D1	495	D1
Chloride	3		1630	B	521		688	B	755	B	734	B	722	B	945	B	779	B	608	B			941	B	1140	B	931		1500	D	1860	D	1800	D
Fluoride	1		ND	J	ND		ND	J	ND		ND	J	ND	JB	ND		3.69		ND	J			ND	J	ND	JB	0.128	J	0.2		0.2		0.2	
Sulfate	5		1760	HB	876		1780		1740	B	1880		1760	B	2060	B	1920		1600	B			1800		1890	B	1800		2990	D	3720	D	973	D
pH (SU)	0.10		6.76		6.74		6.99		6.61		7.14		7.44		6.87		7.13		7.06		6.88		6.40		7.99		7.15		7.41	H3	6.77		6.52	
Total Dissolved Solids	10		4210		1660		3470		3610		3680		4250		4130		4120		4390				4100		4540		4360	B	5320	H1	4960		5170	
APPENDIX IV CONSTITUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND		ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.0000700	JB	ND	V1 U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	JB	ND	J	ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000424	JB	ND	D2 U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.0167	J	0.016	D2 J	0.014		0.014	
Beryllium	0.002	0.004 mg/L	ND		ND		ND	J	ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U	<0.0020		<0.0040	D2
Cadmium	0.001	0.005 mg/L	ND	J	ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND	J	ND	J	ND		ND	J			0.00363	B	ND		NA		0.00159	JB	0.0033		<0.0020		0.0008	J
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND		ND	J	ND		ND	J			ND	JB	ND	J	NA		0.000288	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND		ND	J	ND		ND	J	ND		ND		3.69				ND	J	ND	J	ND	JB	0.128	J	0.2		0.2		0.2	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND				ND	J	ND	J	NA		0.0000860	J	ND	V1 U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.521		0.136		0.305		0.325		0.368		0.415		0.405		0.353				0.459		0.481		0.425		0.434		0.40	D1	0.38		0.42	D2
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		0.00351		ND				ND		ND		ND		ND		ND	V1 U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U	<0.01		<0.01	
Radium 226	1	5 pCi/L	1.16		0.736		0.959		0.957		0.765		0.888		1.54		0.773				0.862		1.42		1.37		0.945		0.368		1.48		1.68	
Radium 228																													0.730					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND	J	ND	J	ND		ND				ND	J	ND		NA		0.000624	J	ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND		ND	J	ND	J	ND		ND	J	ND		ND	J			ND	J	ND		NA		0.0000890	J	ND	V1 U	<0.0020		<0.0020	

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GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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-6

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																											
			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		6/4/2018		7/10/2018		9/28/2018		4/22/2019		9/30/2019		4/6/2020		9/22/2020	
			Baseline Events																		Assessment		Re-Sampling		Assessment							
Boron	0.08		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				0.155	J	0.196	JB	0.194	JB	ND	D2 U	0.19		0.19	
Calcium	0.5		467		374	B	373		400		320		415		365		382	B	376				386		356	B	421		431	D1	458	D1	417	D1
Chloride	3		167	B	149	B	136	JB	150	B	125	B	129	B	128	B	123	B	138	B			147	B	142	B	142		230	D	181	D	286	D
Fluoride	1		ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		ND	J	ND	J			ND	J	ND	JB	0.409	J	0.5		0.4		0.5	
Sulfate	5		2250	HB	3340		2550		2610	B	2700		2600	B	2820	B	2490		2700	B			2120		2420		2200		3830	D	4650	D	2380	D, H2
pH (SU)	0.10		6.66		6.65		6.96		6.6		6.92		6.97		6.76		6.95		6.86				6.50		7.94		6.86		7.15	H3	6.36		6.32	
Total Dissolved Solids	10		4060		4280		4350		4470		4720		4700		4830		4890		4910				4500		4820		4780	B	4830	H1	4610		4740	
APPENDIX IV CONSTITUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	J	ND	JB	ND		ND		ND	JB	ND	JB	ND	JB			ND	JB	ND		NA		0.0000920	JB	ND	V1 U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB			ND	JB	ND	J	ND	JB	0.000722	JB	ND	V1 U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.0128	J	0.010	D2 J	0.011		0.011	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	D2 U	<0.0020		<0.0020	V1
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		ND		ND	V1 U	0.0001	J	<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J			ND	JB	ND		NA		0.00196	JB	ND	U	<0.0020		0.0006	J
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	J	NA		0.000276	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND		ND	J			ND	J	ND	J	ND	JB	0.409	J	0.5		0.4		0.5	
Lead	0.005	0.015 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND				ND		ND	J	NA		ND		ND	V1 U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0475	J	0.0527		0.0555		0.0524		0.0607		0.0724		0.0589		0.0554				0.0650		0.0592		0.0558		0.0633		0.05	D2 V1 J	0.05		0.05	D2, J
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		ND		ND		ND	V1 U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	B	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		0.000972	J	ND	D2 U	<0.01		<0.01	
Radium 226	1	5 pCi/L	0.741		0.386		ND		0.751		ND		ND		0.462		ND				0.392		0.532		ND	U	0.450		0.548		0.744		0.380	
Radium 228																													0.698					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND	J	ND		NA		0.00110	J	ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		0.0000610	J	ND	V1 U	<0.0020		<0.0020	

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ND = Not Detected at or above Method Detection Limit
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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.
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
H2 = Initial analysis within holding time. Reanalysis was past 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-104

	Detection Limit	GWPS	DATE									
APPENDIX III CONSTITUENTS			**3/29/2019**		**4/10/2019**		**10/25/2019**		**4/17/2020**		**10/1/2020**	
			Characterization									
Boron	0.08		0.1880	JB	0.2710	JB	ND	D2, U	0.21		0.23	D2
Calcium	0.5		465	B	502		505	D1	527	D1	491	D1
Chloride	3		1430		1430	B	1610	D	2630	D	2220	D
Fluoride	1		ND		0.3230	JB	0.4		0.3		0.3	
Sulfate	5		2870		2880	B	2440	D	4710	D	2730	D
pH (Field Measurement)	0.10		6.88		6.99		6.86		6.58		6.91	
Total Dissolved Solids	10		6990		6690		7330		6320		6270	
APPENDIX IV CONSTITUENTS												
Antimony	0.002	0.006 mg/L	0.0001	JB	0.0001	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	0.0022	J	0.0021	J	0.0039		0.0013		0.0013	
Barium	0.2	2 mg/L	0.0243	J	0.0216	JB	0.030		0.018		0.018	
Beryllium	0.002	0.004 mg/L	ND		ND		ND	U	<0.0020		<0.0020	D2
Cadmium	0.001	0.005 mg/L	ND		ND		0.0004	J	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.0047	B	0.0036		0.0066		0.0020		0.0013	J
Cobalt	0.005	0.006 mg/L	0.0059	B	0.0052		0.011		0.005		0.005	
Fluoride	1	4 mg/L	ND		0.3230	JB	0.4		0.3		0.3	
Lead	0.005	0.015 mg/L	0.0011	J	0.0002	J	0.003		<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0281	J	0.0286	J	0.02		0.02		0.02	D2
Mercury	0.0002	0.002 mg/L	ND		ND	^	ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0015	J	0.0010	J	0.005	J	0.003	J	<0.01	D2
Radium 226	1	5 pCi/L	0.7760		0.3190	U	0.126		0.655		0.422	
Radium 228							1.52					
Selenium	0.01	0.05 mg/L	ND		ND		ND	U	<0.003		<0.003	D2
Thallium	0.001	0.002 mg/L	ND		ND		ND	U	<0.0020		<0.0020	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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

Appendix C
Green Surface Impoundment Analytical Summary Tables

GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-11

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/27/2018		4/29/2019		10/3/2019		4/8/2020		9/25/2020	
			Baseline Events																						Detection					
Boron	0.08	NA	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		0.671	B	0.717		ND	D2, M2. M4, U	0.78	M2, M4	<1.00	D2, M2
Calcium	0.5	NA	371		378	B	243		291		276		326	B	321		299		315	B	317		312		345		318	D1, M1	316	D1. M2	335	D2,M3
Chloride	3	NA	1070	B	1740	B	1880	B	2000	B	1880	B	1910	B	2360	B	1520	B	1940	B	1860	B	2000	B	1900		3900	D	2270	D	2620	D
Fluoride	1	4 mg/L	ND	J	ND	J	ND	JB^	ND		ND	JB	ND	JB	ND		ND	JB	ND	J F1	ND	J	ND	J	0.227	J	0.2		0.2		0.2	
Sulfate	5	NA	1170		1400		1150		1150	B	1060		1010	B	1410		797	J	1050	B	1020	B	1080	B	949	B	971		1210	D	1280	D
pH (Field Measurement)	0.10	NA	7.23		7.24		7.29		7.22		7.20		7.04		6.89		6.88		6.86		7.18		6.70		7.11		6.86		6.78		6.98	
Total Dissolved Solids	10	NA	3920	H	4610		4840		4490		4930		4830		5100		4880		5080		5070		5020		4890	B	682		4650		4510	
APPENDIX IV CONSTIUENTS																																
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB	ND	JB													
Arsenic	0.005	0.01 mg/L	ND	J	ND		ND		ND	J	ND	J	ND	JB	ND	J	ND	JB													
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J													
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND														
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND														
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J													
Cobalt	0.005	0.006 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													
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND		ND	J	ND	J	ND		ND	JB							0.227	J	0.2		0.2		0.2	
Lead	0.005	0.015 mg/L	ND		ND	JB	ND		ND		ND		ND		ND	J	ND														
Lithium	0.05	0.040 mg/L	0.0365	J	0.0685		0.0651		0.0544		0.0591		0.0545		0.0615		0.0596														
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND														
Molybdenum	0.01	0.1 mg/L	0.0163		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND														
Radium 226 + Radium 228	1	5 pCi/L	1.35		0.975		1.61		1.86		1.66		2.18		2.69		2.08														
Selenium	0.01	0.05 mg/L	ND		ND	J	ND	J	ND		ND	J	ND	JB	ND		ND	J													
Thallium	0.001	0.002 mg/L	ND	J	ND		ND		ND		ND		ND	J	ND	J	ND														

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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 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.
U = Target analyte was analyzed for, but was below detection limit

GREEN SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-12

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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		9/27/2018		4/29/2019		10/4/2019		4/8/2020		9/25/2020	
			Baseline Events																				Detection									
Boron	0.08	NA	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		0.335	B	0.290		ND	D2, U	0.31		<1.00	D2
Calcium	0.5	NA	68.6		95.1	B	81.0		99.4		87.7		90.9	B	88.5		94.5		92	B	345		93.5		96.4		93.1		92.0	D2	98.3	D2	89.6	D2
Chloride	3	NA	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		15.5	B	15.1		14.0		13.9		13.5	
Fluoride	1	4 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	ND	J	0.428	J	0.4		0.4		0.4	
Sulfate	5	NA	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	14.3		11.9	B	11		9		8	
pH (Field Measurement)	0.10	NA	7.85		7.4		7.52		7.33		7.65		5.02		6.56		7.07		7.07		7.11		7.34		6.84		7.36		7.07		6.90		6.83	
Total Dissolved Solids	10	NA	472		745		726		677		679		676		674		758		641		4890	B	649		595		618	B	546		532		658	
APPENDIX IV CONSTIUENTS																																		
Antimony	0.002	0.006 mg/L	0.00204		ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB	ND	JB																
Arsenic	0.005	0.01 mg/L	0.00596		0.00566		ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB																
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J																
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Chromimum	0.003	0.1 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND	J																
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J																
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J	ND	JB			0.227	J					0.428	J	0.4		0.4		0.4	
Lead	0.005	0.015 mg/L	ND	J	ND	JB	ND		ND		ND		ND		ND	J	ND	J																
Lithium	0.05	0.040 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																
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Molybdenum	0.01	0.1 mg/L	0.0769		0.0234		0.0141		0.0123		0.0100		ND	JB	ND	J	ND	J																
Radium 226 Radium 228	1	5 pCi/L	0.842		ND		ND		0.954		0.361		0.556		0.566		ND																	
Selenium	0.01	0.05 mg/L	ND	J	ND		ND		ND		ND		ND	JB	ND		ND																	
Thallium	0.001	0.002 mg/L	ND		ND		ND		ND		ND		ND	JB	ND		ND																	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value
B = Compound was found in the blank and sample
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	Detection Limit	GWPS	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		9/27/2018		4/29/2019		10/4/2019		4/8/2020		9/25/2020	
			Baseline Events																				Detection									
Boron	0.08	NA	ND	B	ND	J	ND	JB	ND	J	ND	JB	ND	JB	ND	JB	ND	J	ND	J	0.717		ND	J	0.0565	JB	0.0392	J	ND	D2, U	<0.10		<1.00	D2
Calcium	0.5	NA	93.0		95.1	B	85.1		94.5		82.8		90.2	B	92.3		94.3		92.2	B	345		94.3		95.6		95.1		87.4	D2	86.6	D2	84.9	D2
Chloride	3	NA	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		21.0		26.6	B	24.4		24.6		22.8		33.3	D
Fluoride	1	4 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	ND	J	0.271	J	0.2		0.3		0.4	D
Sulfate	5	NA	118		118		106		104	B	96.2		98.1	J	96.6		88.0		96.4	B	949	B	87.6	B	109	B	98.6	B	41		117	D	87	D
pH (Field Measurement)	0.10	NA	6.78		6.9		6.97		6.86		7.22		8.25		6.48		6.64		6.62		7.11		7.03		6.54		6.94		6.75		6.53		6.80	
Total Dissolved Solids	10	NA	699		721		684		704		678		714		702		727		695		4890	B	673		697		711	B	586		608		552	
APPENDIX IV CONSTIUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB	ND	JB																
Arsenic	0.005	0.01 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB																
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J																
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Chromimum	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND	J																
Cobalt	0.005	0.006 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																
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J	ND	JB			0.227	J					0.271	J	0.2		0.3		0.4	D
Lead	0.005	0.015 mg/L	ND	J	ND	JB	ND		ND		ND		ND		ND		ND																	
Lithium	0.05	0.040 mg/L	0.00929	J	0.0104	J	0.0123	J	0.0104	J	0.0113	J	ND		0.0111	J	ND																	
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J																
Radium 226 Radium 228	1	5 pCi/L	ND		ND		ND		ND		ND		0.164		0.47		0.749																	
Selenium	0.01	0.05 mg/L	ND		ND		ND	J	ND		ND		ND		ND		ND																	
Thallium	0.001	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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	etection Lim	GWPS	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		9/27/2018		4/28/2019		4/29/2019		10/3/2019		4/8/2020		9/25/2020	
			Baseline Events																		Detection											
Boron	0.08	NA	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		0.232	B	0.717		0.206		ND	D2, U	0.20		<1.00	D2
Calcium	0.5	NA	194		194	B	171		193		183		193	B	193		187		194	B	189		200		345		206		194	D1	195	D1	194	D2
Chloride	3	NA	161	B	184	B	185	B	193	B	191	B	185	B	212	B	230	B	199	B	198	B	189	B	1900		165		262	D	121	D	131	D
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	JB	ND	JB	ND	J	ND		ND	J	0.227	J	0.342	J	0.3		0.3		0.3	
Sulfate	5	NA	188		219		216		215	B	221		197	B	179		198	J	185		222	B	231	B	949	B	222	B	871	D	183	D	221	D
pH (Field Measurement)	0.10	NA	6.63		6.35		7.43		7.34		7.78		5.23		7.33		7.13		7.32		7.26		6.57		7.11		7.05		6.77		6.57		6.75	
Total Dissolved Solids	10	NA	1080		1130		1140		1130		1150		1170		1150		1240		1170		1180		1100		4890	B	1180	B	1120	H2	1030		946	
APPENDIX IV CONSTIUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND		ND	JB	ND	JB	ND	JB	ND	JB															
Arsenic	0.005	0.01 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB															
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J															
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																
Chromimum	0.003	0.1 mg/L	ND		ND		ND		ND		ND		ND		ND		ND	J															
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J															
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	JB	ND		ND	JB	ND	J	ND	JB							0.227	J	0.342	J	0.3		0.3		0.3	
Lead	0.005	0.015 mg/L	ND		ND	JB	ND		ND		ND		ND		ND		ND	J															
Lithium	0.05	0.040 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															
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND		ND		ND		ND		ND		ND																
Radium 226 Radium 228	1	5 pCi/L	1.54		1.42		1.86		1.55		1.31		2.17		2.85		1.8																
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																
Thallium	0.001	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND																

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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.

Appendix D
Reid/HMP&L Surface Impoundment Analytical Summary Tables

REID/HMPL SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-7

APPENDIX III CONSTITUENTS	Detection 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	
			Baseline Events																		Assessment		Re-Sample		Assessment									
Boron	0.08	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, U	0.34	M4	0.33	M2, M4
Calcium	0.5	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, M1, M2
Chloride	3	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	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J F1	ND	J F1	ND	JB	ND	J	ND	J F1	ND	J F1	ND	J			ND	J	ND	J	0.255	J	0.3		0.3		0.3	
Sulfate	5	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	
pH (Field Measurement)	0.10	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	
Total Dissolved Solids	10	NA	233		243		243		250		253		291		290		267		278				295		263		271		228		148		114	
APPENDIX IV CONSTIUENTS																																		
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND	J	ND		ND		ND	JB	ND	JB			ND	JB	ND	JB	NA		0.0000760	JB	ND	U	<0.005		<0.005	M2
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	JB	ND	JB	NA		0.00116	J	0.0014		0.0025		0.0015	M2
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.0824	J	0.062		0.087		0.075	M3
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND		ND	U	<0.0020	V1	<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND		ND	U	<0.0010		<0.0010	M2
Chromium	0.003	0.1 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND	JB	ND	JB	NA		0.00136	J	ND	U	<0.0020		<0.0020	M2
Cobalt	0.005	0.006 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J			ND	J	ND	J	NA		0.000158	J	ND	U	<0.004		<0.004	M2
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J F1	ND	J F1	ND	JB	ND	J	ND	J F1	ND	J F1			ND	J	ND	J	ND	J	0.255	J	0.3		0.3		0.3	
Lead	0.005	0.015 mg/L	ND	J	ND	JB	ND		ND	J	ND		ND		ND		ND				ND		ND		NA		0.0000730	J	ND	U	<0.002		<0.002	M2
Lithium	0.05	0.040 mg/L	ND	J	ND		ND		ND		ND	J	ND		ND		ND				ND		ND		ND		ND		0.008	J	0.007	V1, J	0.008	J
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		0.000135		ND				ND		NA		NA		ND		ND	U	<0.0005		<0.0005	M2
Molybdenum	0.01	0.1 mg/L	0.0109		0.0185		0.0136		0.0118		0.0127		ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.00442	J	0.01		0.006	J	0.006	M2, J
Radium 226	1	5 pCi/L	0.865		0.685		0.473		ND		0.921		0.662		0.795		0.642				0.650								0.652		1.83		0.968	
Radium 228																							1.15		0.730		0.698		-0.208					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		NA		NA		ND		ND	U	<0.003		<0.003	M2
Thallium	0.001	0.002 mg/L	ND		ND	J	ND	J	ND		ND		ND		ND		ND				ND		NA		NA		ND		ND	U	<0.0020		<0.0020	M2

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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
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
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

REID/HMPL SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-8

APPENDIX III CONSTITUENTS	Detection 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	
			Baseline Events																				Assessment		Re-Sample		Assessment							
Boron	0.08	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
Calcium	0.5	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
Chloride	3	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	
Fluoride	1	4 mg/L	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	
Sulfate	5	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
pH (Field Measurement)	0.10	NA	7.13		7.14		7.37		7.06		7.50		7.10		7.11		7.10		7.15		7.46		6.97		7.09		6.93		7..25		7.04		6.78		6.58	
Total Dissolved Solids	10	NA	1930		1980		1960		2030		2010		1990		2090		2030		2100		271				2060		1990		2090		2200		1930		1940	
APPENDIX IV CONSTIUENTS																																				
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND	J	ND		ND	JB	ND	JB	ND	JB			0.0000760	B	ND	JB	ND	JB	NA		0.000205	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND		ND	J			0.00116	J	ND	JB	ND	JB	NA		0.000438	J	ND	U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			0.0824	J	ND	J	ND	J	ND	J	0.0188	J	0.016		0.017		0.016	
Beryllium	0.002	0.004 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0020	V1	<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				0.00136	J	ND	JB	ND	JB	NA		0.00320		ND	U	<0.0020		<0.0020	
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND		ND	J	ND		ND				0.000158	J	ND	J	ND	J	NA		0.000141	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	J			0.255	J	ND	J	ND	J	ND	J	0.370	J	0.4		0.4		0.4	
Lead	0.005	0.015 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND				0.0000730	J	ND		ND		NA		0.000104	J	ND	U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0314	J	0.035	J	0.0314	J	0.0324	J	0.0408	J	0.0377	J	0.0367	J	0.0375	J			ND		0.0347	J	0.0368	J	0.0375	J	0.0370	J	0.03		0.03		0.03	
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND	JB	ND				ND		ND		NA		NA		ND		ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	0.0138	J	0.0186		0.0157		0.0147		0.0173		0.0158		0.0175		0.0139				0.00442	J	0.0147		0.0140		0.0149		0.0146		0.01		0.01		0.01	
Radium 226	1	5 pCi/L	1.98		1.32		1.36		1.36		1.92		1.12		1.48		1.4				0.698		1.29		1.6		1.46		1.43		0.914		1.93		0.366	
Radium 228																															1.59					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND	J			ND		ND		NA		NA		0.000634	J	ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		0.0000470	J	ND	U	<0.0020		<0.0020	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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
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
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

REID/HMPL SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-9

APPENDIX III CONSTITUENTS	Detection 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	
			Baseline Events																				Assessment		Re-Sample		Assessment							
Boron	0.08	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	
Calcium	0.5	NA	64.1		71.2	B	71.5		72.3		75.0	B	72.9		60.8		57.6		57.0	B	46.1				68.6		60.3	B	68.6		66.8	D2	71.2	D2	65.3	D2
Chloride	3	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		19.9	
Fluoride	1	4 mg/L	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		0.3	
Sulfate	5	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	
pH (Field Measurement)	0.10	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	
Total Dissolved Solids	10	NA	363		389		403		409		465		435		303		308		316		271				399		293				392		320		308	
APPENDIX IV CONSTIUENTS																																				
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND	J	ND		ND	JB	ND	JB	ND	JB			0.0000760	B	ND	JB	ND	JB	NA		0.000192	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND				0.00116	J	ND	JB	ND	JB	NA		0.000563	J	ND	U	<0.0010		<0.0010	
Barium	0.2	2 mg/L	1.1		1.03		0.889		0.635		0.827		0.833		0.253		0.227				0.0824	J	0.967		0.777		0.288		1.03		0.763		1.06	D1	0.730	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0020	V1	<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				0.00136	J	ND	JB	ND	JB	NA		0.00316		ND	U	<0.0020		<0.0020	
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND		ND		ND		ND				0.000158	J	ND	JB	ND	J	NA		0.0000550	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	J	ND	J			0.255	J	ND	JB	ND	J	ND	J	0.223	J	0.2		0.3		0.3	
Lead	0.005	0.015 mg/L	ND		ND	JB	ND		ND	J	ND		ND		ND		ND				0.0000730	J	ND		ND		NA		0.0000760	J	ND	U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.0120	J	0.0105	J	0.0102	J	0.0119	J	0.0179	J	0.0136	J	ND		ND				ND		0.0108	JB	0.0112	J	ND		0.0141	J	0.009	J	0.01	V1, J	0.009	J
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND	JB	ND	J			ND		ND		NA		NA		ND		ND	U	<0.0005		<0.0005	
Molybdenum	0.01	0.1 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				0.00442	J	ND		ND		ND		ND		ND	U	<0.01		<0.01	
Radium 226	1	5 pCi/L	2.87		2.84		2.91		1.38		2.11		2.53		1.28		1.26				0.698		2.04		1.93		1.23		2.32		1.09		2.90		3.44	
Radium 228																															1.23					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0020		<0.0020	

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GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
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V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample

REID/HMPL SURFACE IMPOUNDMENT - ANALYTICAL SUMMARY
MW-10

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	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	
			Baseline Events																				Assessment		Re-Sample		Assessment								
Boron	0.08	NA	0.416		0.336	J	0.460	J	0.489	J	0.540	JB	0.679	JB	0.560	JB	0.543	J	0.637	J	0.309	JB			0.419	J	0.464	J	0.498	JB	ND	D2,U	0.54		0.51	
Calcium	0.5	NA	16.5		21.3	B	23		36		14.3	B	13.1		33.7		21.4		11.9	B	46.1				9.94		10.5	B	19.5		9.76	D2	12.5	D2	8.80	D2
Chloride	3	NA	31.5	B	26.9		28.9	B	31.6	B	29.4	JB	29.1	B	32.3	B	29.7	B	25.8	B	4.94				26.7	B	27.9	B	26.6		25.7		21.5		21.4	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	J	ND		ND	J	ND	J	ND	J	ND	J	0.255	J			ND	J	ND	J	0.570	J	0.6		0.5		0.5	
Sulfate	5	NA	208	HB	135		144		152		145		168		177	B	226	B	147		16.8	B			129		138	B	114	B	80	D	58	D	62	D
pH (Field Measurement)	0.10	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	
Total Dissolved Solids	10	NA	644		532		558		602		679		763		758		763		728		271				721		673		642		568		466		436	
APPENDIX IV CONSTIUENTS																																				
Antimony	0.002	0.006 mg/L	ND		ND	JB	ND	JB	ND	J	ND		ND	JB	ND	JB	ND	JB			0.0000760	B	ND	JB	ND	JB	NA		0.0000580	JB	ND	U	<0.005		<0.005	
Arsenic	0.005	0.01 mg/L	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J			0.00116	J	ND	JB	ND	JB	NA		0.00254	J	0.0022		0.0019		0.0019	
Barium	0.2	2 mg/L	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND	JB	ND	J			0.0824	J	ND	J	ND	J	ND	J	0.100	J	0.077		0.093		0.084	
Beryllium	0.002	0.004 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0020	V1	<0.0020	
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	ND	J	ND	J	ND	J	ND		ND	J	ND	J	ND	JB	ND				0.00136	J	ND	JB	ND	JB	NA		0.00299	J	0.0006	J	<0.0020		0.0006	J
Cobalt	0.005	0.006 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J			0.000158	J	ND	J	ND	J	NA		0.000685	J	ND	U	<0.004		<0.004	
Fluoride	1	4 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			0.255	J	ND	J	ND	J	ND	J	0.570	J	0.6		0.5		0.5	
Lead	0.005	0.015 mg/L	ND		ND	JB	ND		ND	J	ND	J	ND	J	ND		ND				0.0000730	J	ND	J	ND		NA		0.000671	J	ND	U	<0.002		<0.002	
Lithium	0.05	0.040 mg/L	0.339		0.199		0.219		0.0736		0.481		0.607		0.204		0.345				ND		0.694		0.630		0.570		0.574		0.51		0.49		0.56	
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND	JB	ND				ND		ND		NA		NA		ND		0.0002	J	0.0002	J	0.0002	J
Molybdenum	0.01	0.1 mg/L	0.0170	J	0.0171		0.0141		ND	J	0.0119		ND	J	ND	J	ND	J			0.00442	J	ND	J	ND	J	ND	J	0.00797	J	0.007	J	0.006	J	0.007	J
Radium 226	1	5 pCi/L	0.612		ND		0.715		ND		0.422		0.287		0.619		0.391				0.698		0.512		0.683		0.704		0.205	U	0.458		1.24		0.594	
Radium 228																															0.379					
Selenium	0.01	0.05 mg/L	ND		ND		ND		ND	J	ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.003		<0.003	
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND		ND		ND		ND		ND				ND		ND		NA		NA		ND		ND	U	<0.0020		<0.0020	

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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
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

REID/HMPL SURFACE IMPOUNDMENT - CCR ANALYTICAL SUMMARY
MW-110

	Detection Limit	GWPS	DATE									
APPENDIX III CONSTITUENTS			**3/29/2019**		**4/10/2019**		**10/24/2019**		**4/17/2020**		**10/1/2020**	
			Characterization									
Boron	0.08		0.484	JB	0.496	JB	ND	D2, U	0.54	M4	0.53	D2, M1, M4
Calcium	0.5		176	B	178		204	D1	181	D1, M2	162	D1, M2
Chloride	3		26.0		30.4	B	30.0		22.1		19.9	
Fluoride	1		0.279	J	0.255	JB	0.3		0.3		0.3	
Sulfate	5		563		596	B	568	D M1	460	D	411	D
pH (Field Measurement)	0.10		7.25		7.50		6.84		7.17		7.56	
Total Dissolved Solids	10		1170		1200		1270		1150		1060	
APPENDIX IV CONSTITUENTS												
Antimony	0.002	0.006 mg/L	0.000240	JB	0.000204	JB	ND	U	<0.005		<0.005	M4
Arsenic	0.005	0.01 mg/L	0.00534		0.00238	J	ND	U	0.0012		0.0004	J
Barium	0.2	2 mg/L	0.118	J	0.107	JB	0.065		0.065		0.056	M1
Beryllium	0.002	0.004 mg/L	0.000716	J	0.000314	J	ND	U	<0.0020	M2	<0.0020	M4
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U	<0.0010		<0.0010	
Chromium	0.003	0.1 mg/L	0.0180	B	0.0115		0.0010	J	0.0047		0.0016	J
Cobalt	0.005	0.006 mg/L	0.00911	B	0.00384	J	ND	U	<0.004		<0.004	M4
Fluoride	1	4 mg/L	0.279	J	0.255	JB	0.3		0.3		0.3	
Lead	0.005	0.015 mg/L	0.00661		0.00399	J	ND	U	0.002		0.0008	J
Lithium	0.05	0.040 mg/L	0.0299	J	0.0303	J	0.02		0.02		0.02	M4
Mercury	0.0002	0.002 mg/L	ND		ND	^	ND	U	0.0002	J	<0.0005	M1, M4
Molybdenum	0.01	0.1 mg/L	0.00153	J	0.00120	J	ND	U	<0.01		<0.01	M4
Radium 226	1	5 pCi/L	1.84		1.93		0.195		1.37		0.941	
Radium 228							0.727					
Selenium	0.01	0.05 mg/L	ND		ND		ND	U	<0.003		<0.003	M4
Thallium	0.001	0.002 mg/L	0.000112	J	0.0000640	J	ND	U	<0.0020		<0.0020	

*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)
GWPS = Groundwater Protection Standard
NA = Not Analyzed
ND = Not Detected at or above Method Detection Limit
pCi/L = picoCuries per Liter
J = Result is less than the Reporting Limit but greater than or equal to the Method Detection Limit and the concentration is an approximate value.
B = Compound was found in the blank and sample.
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
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
U = Target analyte was analyzed for, but was below detection limit
V1 = CCV recovery was above method acceptance limits. This target analyte not detected in the sample

Appendix E
Green Landfill Analytical Laboratory Reports

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Certificate of Analysis
0041376

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 04/30/2020 14:59

Project Name:	Green Landfill Semiannual Groundwater	Workorder:	0041376

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/07/2020 15:49.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0041376-01	MW1/	Groundwater	04/06/2020 13:05	04/07/2020 15:49	Phillip Hill
0041376-02	MW2/	Groundwater	04/07/2020 11:40	04/07/2020 15:49	Phillip Hill
0041376-03	MW3A/	Groundwater	04/07/2020 13:55	04/07/2020 15:49	Phillip Hill
0041376-04	MW4/	Groundwater	04/07/2020 09:55	04/07/2020 15:49	Phillip Hill
0041376-05	MW5/	Groundwater	04/07/2020 10:10	04/07/2020 15:49	Phillip Hill
0041376-06	MW6/	Groundwater	04/06/2020 14:20	04/07/2020 15:49	Phillip Hill
0041376-07	DUPLICATE/	Groundwater	04/07/2020 10:20	04/07/2020 15:49	Phillip Hill
0041376-08	FIELD BLANK/	Water	04/07/2020 11:50	04/07/2020 15:49	Phillip Hill

LabNumber	Measurement	Value
0041376-01	Field Conductance	867
	Field pH	7.22
	Field Temp (C)	18.23
0041376-02	Field Conductance	1590
	Field pH	6.92
	Field Temp (C)	16.86
0041376-03	Field Conductance	8090
	Field pH	6.92
	Field Temp (C)	16.86
0041376-04	Field Conductance	6770
	Field pH	6.70
	Field Temp (C)	16.47
0041376-05	Field Conductance	6250
	Field pH	6.77
	Field Temp (C)	14.85
0041376-06	Field Conductance	5010
	Field pH	6.36
	Field Temp (C)	20.50
0041376-07	Field Conductance	6770
	Field pH	6.70
	Field Temp (C)	16.47

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-01**
Description: **MW1**

Sample Collection Date Time: 04/06/2020 13:05
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Arsenic	**0.0019**		mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Barium	**0.087**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Boron	**1.69**	D1, M3	mg/L	1.00	1.00	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:42	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Calcium	**27.7**	D1, M3	mg/L	4.00	1.30	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:42	DMH
Chromium	**0.0011**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Iron	**1.57**		mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:39	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH
Sodium	**206**	D1, M3	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:46	DMH
Thallium	**0.0001**	J	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:13	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	8	8	HACH 8000	04/10/2020 13:13	04/10/2020 13:13	ALT
Specific Conductance (Lab)	**962**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:52	04/09/2020 15:52	JLW
pH (Lab)	**7.50**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:14	04/09/2020 16:14	GAT
Total Dissolved Solids	**488**		mg/L	50	50	2540 C-2011	04/13/2020 10:14	04/14/2020 12:26	MAG
Total Organic Carbon	**1.0**		mg/L	0.5		5310 C-2011	04/14/2020 10:27	04/14/2020 10:27	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.340**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.468**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.808**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**6.5**		mg/L	2.0	1.3	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC
Sulfate	**21**		mg/L	1	0.5	SW846 9056	04/16/2020 00:56	04/16/2020 00:56	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-02**
Description: **MW2**

Sample Collection Date Time: 04/07/2020 11:40
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Arsenic	**0.0033**		mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Barium	**0.238**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:49	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Calcium	**145**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:55	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Iron	**0.459**		mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:49	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Lithium	**0.007**	J	mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH
Sodium	**66.5**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 16:55	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:16	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**12**		mg/L	8	8	HACH 8000	04/10/2020 13:13	04/10/2020 13:13	ALT
Specific Conductance (Lab)	**1530**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:53	04/09/2020 15:53	JLW
pH (Lab)	**7.22**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:15	04/09/2020 16:15	CML
Total Dissolved Solids	**806**		mg/L	50	50	2540 C-2011	04/13/2020 10:18	04/14/2020 12:26	MAG
Total Organic Carbon	**1.0**		mg/L	0.5		5310 C-2011	04/14/2020 10:48	04/14/2020 10:48	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.513**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.016**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.529**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**120**	D	mg/L	100	64.0	SW846 9056	04/16/2020 01:29	04/16/2020 01:29	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 01:12	04/16/2020 01:12	CSC
Sulfate	**85**	D	mg/L	50	25	SW846 9056	04/16/2020 01:29	04/16/2020 01:29	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-03**
Description: **MW3A**

Sample Collection Date Time: 04/07/2020 13:55
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Barium	**0.042**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Boron	**0.26**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:11	DMH
Cadmium	**0.0001**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Calcium	**425**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:17	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:11	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Lithium	**0.68**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH
Sodium	**352**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:17	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:20	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**160**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**7660**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:54	04/09/2020 15:54	JLW
pH (Lab)	**7.07**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:16	04/09/2020 16:16	CML
Total Dissolved Solids	**5860**		mg/L	50	50	2540 C-2011	04/13/2020 10:22	04/14/2020 12:26	MAG
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	04/14/2020 12:15	04/14/2020 12:15	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.603**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.460**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.06**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**3220**	D	mg/L	200	128	SW846 9056	04/16/2020 02:02	04/16/2020 02:02	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	04/16/2020 01:45	04/16/2020 01:45	CSC
Sulfate	**1840**	D	mg/L	100	50	SW846 9056	04/16/2020 02:02	04/16/2020 02:02	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-04**
Description: **MW4**

Sample Collection Date Time: 04/07/2020 09:55
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Barium	**0.022**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Boron	**0.83**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:20	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Calcium	**464**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:27	DMH
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:20	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Lithium	**0.82**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Mercury	**0.0003**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Selenium	**0.023**		mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH
Sodium	**433**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:27	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:24	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**44**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**6460**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:55	04/09/2020 15:55	JLW
pH (Lab)	**7.10**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:17	04/09/2020 16:17	CML
Total Dissolved Solids	**5120**		mg/L	50	50	2540 C-2011	04/13/2020 10:26	04/14/2020 12:26	MAG
Total Organic Carbon	**0.6**		mg/L	0.5		5310 C-2011	04/14/2020 12:37	04/14/2020 12:37	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.476**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.787**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.26**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1560**	D	mg/L	200	128	SW846 9056	04/16/2020 02:34	04/16/2020 02:34	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 02:18	04/16/2020 02:18	CSC
Sulfate	**4000**	D	mg/L	100	50	SW846 9056	04/16/2020 02:34	04/16/2020 02:34	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-05**
Description: **MW5**

Sample Collection Date Time: 04/07/2020 10:10
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Barium	**0.014**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Boron	**0.25**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:30	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Calcium	**464**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:36	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:30	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Lithium	**0.38**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH
Sodium	**217**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:36	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:28	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**463**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**5950**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:56	04/09/2020 15:56	JLW
pH (Lab)	**6.94**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:18	04/09/2020 16:18	CML
Total Dissolved Solids	**4960**		mg/L	50	50	2540 C-2011	04/13/2020 10:30	04/14/2020 12:26	MAG
Total Organic Carbon	**0.6**		mg/L	0.5		5310 C-2011	04/16/2020 21:48	04/16/2020 21:48	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.302**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**1.18**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.48**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1860**	D	mg/L	200	128	SW846 9056	04/16/2020 03:07	04/16/2020 03:07	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 02:51	04/16/2020 02:51	CSC
Sulfate	**3720**	D	mg/L	100	50	SW846 9056	04/16/2020 03:07	04/16/2020 03:07	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-06**
Description: **MW6**

Sample Collection Date Time: 04/06/2020 14:20
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Boron	**0.19**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:49	DMH
Cadmium	**0.0001**	J	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Calcium	**458**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:55	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Iron	**0.078**	J	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:49	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Lithium	**0.05**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH
Sodium	**435**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:55	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:32	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**22**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**4960**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:57	04/09/2020 15:57	JLW
pH (Lab)	**6.76**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:19	04/09/2020 16:19	CML
Total Dissolved Solids	**4610**		mg/L	50	50	2540 C-2011	04/13/2020 10:34	04/14/2020 12:26	MAG
Total Organic Carbon	**2.0**		mg/L	0.5		5310 C-2011	04/16/2020 22:11	04/16/2020 22:11	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.061**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.683**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.744**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**181**	D	mg/L	100	64.0	SW846 9056	04/16/2020 04:13	04/16/2020 04:13	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/16/2020 03:57	04/16/2020 03:57	CSC
Sulfate	**4650**	D	mg/L	100	50	SW846 9056	04/16/2020 12:57	04/16/2020 12:57	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-07**
Description: **DUPLICATE**

Sample Collection Date Time: 04/07/2020 10:20
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Barium	**0.022**		mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Boron	**0.86**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:58	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Calcium	**503**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:05	DMH
Chromium	**0.0009**	J	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 17:58	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Lithium	**0.84**		mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Mercury	**0.0003**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Molybdenum	**0.003**	J	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Selenium	**0.025**		mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH
Sodium	**468**	D1	mg/L	26.0	10.0	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:05	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:36	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**62**		mg/L	8	8	HACH 8000	04/10/2020 13:14	04/10/2020 13:14	ALT
Specific Conductance (Lab)	**6410**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:58	04/09/2020 15:58	JLW
pH (Lab)	**7.12**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:20	04/09/2020 16:20	CML
Total Dissolved Solids	**4700**		mg/L	50	50	2540 C-2011	04/13/2020 10:38	04/14/2020 12:26	MAG
Total Organic Carbon	**0.8**		mg/L	0.5		5310 C-2011	04/16/2020 22:34	04/16/2020 22:34	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.371**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**1.10**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**1.47**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1480**	D	mg/L	100	64.0	SW846 9056	04/21/2020 14:14	04/21/2020 14:14	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/16/2020 04:46	04/16/2020 04:46	CSC
Sulfate	**4050**	D	mg/L	100	50	SW846 9056	04/23/2020 12:44	04/23/2020 12:44	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0041376-08**
Description: **FIELD BLANK**

Sample Collection Date Time: 04/07/2020 11:50
Sample Received Date Time: 04/07/2020 15:49

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH
Sodium	ND	U	mg/L	0.26	0.10	SW846 6010 B	04/09/2020 07:40	04/12/2020 18:08	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/09/2020 07:40	04/12/2020 16:55	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	8	8	HACH 8000	04/10/2020 13:15	04/10/2020 13:15	ALT
Specific Conductance (Lab)	**8**		umhos/cm	1	1	2510 B-2011	04/09/2020 15:59	04/09/2020 15:59	JLW
pH (Lab)	**7.62**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:21	04/09/2020 16:21	CML
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	04/13/2020 10:42	04/14/2020 12:26	MAG
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	04/16/2020 22:57	04/16/2020 22:57	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.224**	_Sub	pCi/L			EPA 903.1	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium-228	**0.262**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW
Radium	**0.486**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	04/30/2020 14:07	04/30/2020 14:09	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	M1, U	mg/L	2.0	1.3	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC
Fluoride	ND	M1, U	mg/L	0.2	0.1	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC
Sulfate	ND	M1, U	mg/L	1	0.5	SW846 9056	04/16/2020 05:03	04/16/2020 05:03	CSC

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Notes for work order 0041376

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
M3	The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.
U	Target analyte was analyzed for, but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
Blank (B015276-BLK1)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:05										
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
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 (B015276-BLK2)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:33										
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
LCS (B015276-BS1)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:09										
Molybdenum	0.07	0.01	mg/L	0.0625		105	85-115			
Antimony	0.068	0.005	mg/L	0.0625		109	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		98.3	85-115			
Arsenic	0.0645	0.0010	mg/L	0.0625		103	85-115			
Barium	0.062	0.004	mg/L	0.0625		99.5	85-115			
Beryllium	0.0613	0.0020	mg/L	0.0625		98.1	85-115			
Cadmium	0.0621	0.0010	mg/L	0.0625		99.4	85-115			
Chromium	0.0641	0.0020	mg/L	0.0625		103	85-115			
Cobalt	0.064	0.004	mg/L	0.0625		102	85-115			
Copper	0.060	0.003	mg/L	0.0625		95.6	85-115			
Lead	0.062	0.002	mg/L	0.0625		98.7	85-115			
Lithium	0.06	0.02	mg/L	0.0625		96.9	85-115			
Selenium	0.065	0.003	mg/L	0.0625		104	85-115			
Thallium	0.0632	0.0020	mg/L	0.0625		101	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
LCS (B015276-BS2)										
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:36										
Boron	0.12	0.10	mg/L	0.125		94.1	85-115			
Calcium	5.92	0.40	mg/L	6.25		94.8	85-115			
Iron	6.27	0.100	mg/L	6.25		100	85-115			
Sodium	6.12	0.26	mg/L	6.25		97.9	85-115			
Matrix Spike (B015276-MS1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:59										
Molybdenum	0.06	0.01	mg/L	0.0625	ND	102	80-120			
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120			
Mercury	0.0023	0.0005	mg/L	0.00250	ND	93.6	80-120			
Arsenic	0.0634	0.0010	mg/L	0.0625	0.0019	98.3	80-120			
Barium	0.150	0.004	mg/L	0.0625	0.087	101	80-120			
Beryllium	0.0547	0.0020	mg/L	0.0625	ND	87.4	80-120			
Cadmium	0.0562	0.0010	mg/L	0.0625	ND	89.9	80-120			
Chromium	0.0656	0.0020	mg/L	0.0625	0.0011	103	80-120			
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120			
Copper	0.056	0.003	mg/L	0.0625	ND	89.6	80-120			
Lead	0.056	0.002	mg/L	0.0625	ND	90.2	80-120			
Lithium	0.09	0.02	mg/L	0.0625	0.03	95.1	80-120			
Selenium	0.055	0.003	mg/L	0.0625	ND	88.1	80-120			
Thallium	0.0579	0.0020	mg/L	0.0625	0.0001	92.5	80-120			
Matrix Spike (B015276-MS2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 16:58										
Boron	1.85	1.00	mg/L	0.125	1.69	132	80-120			D2, M3
Calcium	34.4	4.00	mg/L	6.25	27.7	106	80-120			D2
Iron	7.68	1.00	mg/L	6.25	1.57	97.8	80-120			D2
Sodium	205	2.60	mg/L	6.25	206	NR	80-120			D2, M3
Matrix Spike Dup (B015276-MSD1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 17:03										
Antimony	0.071	0.005	mg/L	0.0625	ND	114	80-120	7.69	20	
Mercury	0.0025	0.0005	mg/L	0.00250	ND	99.2	80-120	5.81	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	107	80-120	4.09	20	
Arsenic	0.0677	0.0010	mg/L	0.0625	0.0019	105	80-120	6.64	20	
Barium	0.157	0.004	mg/L	0.0625	0.087	111	80-120	4.16	20	
Beryllium	0.0585	0.0020	mg/L	0.0625	ND	93.6	80-120	6.82	20	
Cadmium	0.0610	0.0010	mg/L	0.0625	ND	97.6	80-120	8.15	20	
Chromium	0.0684	0.0020	mg/L	0.0625	0.0011	108	80-120	4.12	20	
Cobalt	0.066	0.004	mg/L	0.0625	ND	106	80-120	4.34	20	
Copper	0.059	0.003	mg/L	0.0625	ND	94.0	80-120	4.78	20	
Lead	0.061	0.002	mg/L	0.0625	ND	97.1	80-120	7.36	20	
Lithium	0.09	0.02	mg/L	0.0625	0.03	98.1	80-120	2.10	20	
Selenium	0.061	0.003	mg/L	0.0625	ND	97.1	80-120	9.79	20	
Thallium	0.0613	0.0020	mg/L	0.0625	0.0001	97.8	80-120	5.64	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015276 - EPA 200.2										
Matrix Spike Dup (B015276-MSD2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 18:11										
Boron	1.80	1.00	mg/L	0.125	1.69	88.6	80-120	2.95	20	D2
Calcium	35.3	4.00	mg/L	6.25	27.7	121	80-120	2.64	20	D2, M3
Iron	8.28	1.00	mg/L	6.25	1.57	107	80-120	7.50	20	D2
Sodium	208	2.60	mg/L	6.25	206	23.5	80-120	1.56	20	D2, M3
Post Spike (B015276-PS1)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 17:06										
Antimony	65.3		ug/L	62.5	0.087	104	75-125			
Mercury	2.49		ug/L	2.50	0.0595	97.1	75-125			
Molybdenum	62.9		ug/L	62.5	1.02	99.0	75-125			
Arsenic	63.0		ug/L	62.5	1.92	97.7	75-125			
Barium	153		ug/L	62.5	87.2	105	75-125			
Beryllium	55.2		ug/L	62.5	-0.0177	88.4	75-125			
Cadmium	57.4		ug/L	62.5	0.0329	91.8	75-125			
Chromium	63.2		ug/L	62.5	1.10	99.4	75-125			
Cobalt	61.3		ug/L	62.5	0.695	96.9	75-125			
Copper	54.1		ug/L	62.5	-2.87	86.6	75-125			
Lead	56.6		ug/L	62.5	0.013	90.6	75-115			
Lithium	85.9		ug/L	62.5	28.0	92.7	75-125			
Selenium	56.3		ug/L	62.5	0.072	89.9	75-125			
Thallium	57.4		ug/L	62.5	0.118	91.7	75-125			
Post Spike (B015276-PS2)	**Source: 0041376-01**									
Prepared: 4/9/2020 7:40, Analyzed: 4/12/2020 18:14										
Boron	1820		ug/L	125	1690	107	75-125			D2
Calcium	33800		ug/L	6250	27700	96.6	75-125			D2
Iron	7590		ug/L	6250	1570	96.4	75-125			D2
Sodium	202000		ug/L	6250	206000	NR	75-125			D2, M3

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015432 - Default Prep Wet Chem										
Blank (B015432-BLK1)										
Prepared: 4/14/2020 1:48, Analyzed: 4/14/2020 1:48										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B015432-BS1)										
Prepared: 4/14/2020 2:09, Analyzed: 4/14/2020 2:09										
Total Organic Carbon	4.8	0.5	mg/L	5.00		95.5	80-120			
Duplicate (B015432-DUP1)	**Source: 0040539-01**									
Prepared: 4/14/2020 7:34, Analyzed: 4/14/2020 7:34										
Total Organic Carbon	2.0	0.5	mg/L		2.0			1.22	25	
Duplicate (B015432-DUP2)	**Source: 0041286-01**									
Prepared: 4/14/2020 12:59, Analyzed: 4/14/2020 12:59										
Total Organic Carbon	1.1	0.5	mg/L		1.1			5.36	25	
Matrix Spike (B015432-MS1)	**Source: 0040539-02**									
Prepared: 4/14/2020 7:55, Analyzed: 4/14/2020 7:55										
Total Organic Carbon	3.6	0.5	mg/L	2.50	1.1	102	80-120			
Matrix Spike (B015432-MS2)	**Source: 0041286-02**									
Prepared: 4/14/2020 13:20, Analyzed: 4/14/2020 13:20										
Total Organic Carbon	5.9	0.5	mg/L	5.00	0.9	100	80-120			
Batch B015433 - Default Prep Wet Chem										
Blank (B015433-BLK2)										
Prepared: 4/16/2020 20:16, Analyzed: 4/16/2020 20:16										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B015433-BS2)										
Prepared: 4/16/2020 20:39, Analyzed: 4/16/2020 20:39										
Total Organic Carbon	4.9	0.5	mg/L	5.00		98.4	80-120			
Duplicate (B015433-DUP1)	**Source: 0041409-01**									
Prepared: 4/14/2020 23:44, Analyzed: 4/14/2020 23:44										
Total Organic Carbon	1.0	0.5	mg/L		1.0			2.11	25	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015433 - Default Prep Wet Chem										
Duplicate (B015433-DUP3) **Source: 0042383-01**										
Prepared: 4/15/2020 12:23, Analyzed: 4/15/2020 12:23										
Total Organic Carbon	2.2	0.5	mg/L		2.2			1.81	25	
Matrix Spike (B015433-MS1) **Source: 0041409-02**										
Prepared: 4/15/2020 0:07, Analyzed: 4/15/2020 0:07										
Total Organic Carbon	3.4	0.5	mg/L	2.50	0.9	99.6	80-120			
Matrix Spike (B015433-MS3) **Source: 0042383-02RE1**										
Prepared: 4/15/2020 12:46, Analyzed: 4/15/2020 12:46										
Total Organic Carbon	6.4	0.5	mg/L	5.00	1.4	101	80-120			
Batch B015469 - Default Prep Wet Chem										
LCS (B015469-BS1)										
Prepared: 4/9/2020 16:08, Analyzed: 4/9/2020 16:08										
pH (Lab)	7.98		Std. Units	8.00		99.8	98.8-101.2			
LCS (B015469-BS2)										
Prepared: 4/9/2020 16:26, Analyzed: 4/9/2020 16:26										
pH (Lab)	8.04		Std. Units	8.00		100	98.8-101.2			
Duplicate (B015469-DUP1) **Source: 0041388-02**										
Prepared: 4/9/2020 16:24, Analyzed: 4/9/2020 16:24										
pH (Lab)	7.29	0.10	Std. Units		7.27			0.275	10	
Duplicate (B015469-DUP2) **Source: 0060028-01**										
Prepared: 4/9/2020 16:34, Analyzed: 4/9/2020 16:34										
pH (Lab)	7.77	0.10	Std. Units		7.76			0.129	10	
Batch B015470 - Default Prep Wet Chem										
Blank (B015470-BLK1)										
Prepared: 4/9/2020 15:46, Analyzed: 4/9/2020 15:46										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015470 - Default Prep Wet Chem										
LCS (B015470-BS1)										
Prepared: 4/9/2020 15:47, Analyzed: 4/9/2020 15:47										
Specific Conductance (Lab)	1410		umhos/cm	1410		99.9	80-120			
Duplicate (B015470-DUP1)	**Source: 0042630-01**									
Prepared: 4/9/2020 16:02, Analyzed: 4/9/2020 16:02										
Specific Conductance (Lab)	202	1	umhos/cm		202			0.148	1.24	
Batch B015517 - Default Prep Wet Chem										
Blank (B015517-BLK1)										
Prepared: 4/10/2020 13:09, Analyzed: 4/10/2020 13:09										
Chemical Oxygen Demand	ND	8	mg/L							U
LCS (B015517-BS1)										
Prepared: 4/10/2020 13:09, Analyzed: 4/10/2020 13:09										
Chemical Oxygen Demand	116	8	mg/L	125		93.0	90-110			
Duplicate (B015517-DUP1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	ND	8	mg/L		ND				25	U
Matrix Spike (B015517-MS1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	262	8	mg/L	250	ND	105	90-110			
Matrix Spike Dup (B015517-MSD1)	**Source: 0041376-01**									
Prepared: 4/10/2020 13:18, Analyzed: 4/10/2020 13:18										
Chemical Oxygen Demand	256	8	mg/L	250	ND	102	90-110	2.46	10	
Batch B016032 - Default Prep Wet Chem										
Blank (B016032-BLK1)										
Prepared: 4/13/2020 9:34, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016032 - Default Prep Wet Chem										
LCS (B016032-BS1)										
Prepared: 4/13/2020 9:38, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	1480	25	mg/L	1500		98.7	80-120			
Duplicate (B016032-DUP1) **Source: 0040819-01**										
Prepared: 4/13/2020 10:50, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	206	50	mg/L		226			9.26	10	
Duplicate (B016032-DUP2) **Source: 0041376-08**										
Prepared: 4/13/2020 10:54, Analyzed: 4/14/2020 12:26										
Total Dissolved Solids	ND	50	mg/L		ND				10	U

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016360 - Default Prep IC										
Blank (B016360-BLK1)										
Prepared: 4/16/2020 0:39, Analyzed: 4/16/2020 0:39										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B016360-BS1)										
Prepared: 4/16/2020 0:23, Analyzed: 4/16/2020 0:23										
Fluoride	9.5		mg/L	10.0		95.0	90-110			
Chloride	9.5		mg/L	10.0		94.9	90-110			
Sulfate	10		mg/L	10.0		98.1	90-110			
Matrix Spike (B016360-MS1) **Source: 0041376-08**										
Prepared: 4/16/2020 5:20, Analyzed: 4/16/2020 5:20										
Fluoride	13.2		mg/L	10.0	0.0	132	75-125			M1
Chloride	13.1		mg/L	10.0	0.1	130	75-125			M1
Sulfate	14		mg/L	10.0	0.1	139	75-125			M1
Matrix Spike Dup (B016360-MSD1) **Source: 0041376-08**										
Prepared: 4/16/2020 5:37, Analyzed: 4/16/2020 5:37										
Chloride	12.3		mg/L	10.0	0.1	122	75-125	6.11	15	
Fluoride	12.5		mg/L	10.0	0.0	125	75-125	5.37	15	
Sulfate	13		mg/L	10.0	0.1	125	75-125	10.7	15	
Batch B016418 - Default Prep IC										
Blank (B016418-BLK1)										
Prepared: 4/16/2020 12:41, Analyzed: 4/16/2020 12:41										
Sulfate	ND	1	mg/L							U
LCS (B016418-BS1)										
Prepared: 4/16/2020 12:24, Analyzed: 4/16/2020 12:24										
Sulfate	10		mg/L	10.0		98.8	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016418 - Default Prep IC										
Matrix Spike (B016418-MS1) **Source: 0043228-02**										
Prepared: 4/16/2020 14:36, Analyzed: 4/16/2020 14:36										
Sulfate	30		mg/L	10.0	17	121	75-125			
Matrix Spike Dup (B016418-MSD1) **Source: 0043228-02**										
Prepared: 4/16/2020 14:52, Analyzed: 4/16/2020 14:52										
Sulfate	30		mg/L	10.0	17	130	75-125	2.87	15	M1

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030)
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
SW846 6010 B in Water	

Sample Acceptance Checklist for Work Order 0041376

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-01 A	4/6/20	1305	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 : ✓				
0041376-01 B	4/6/20	1305	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 : ✓				
0041376-01 C	4/6/20	1305	Plastic 1L	1	MW1	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1305

pH 7.22 Cond ~~(umho)~~ mS/cm 0.867 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 18.23 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
	(1.9°)	4-7-20	1549

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 3/25/2020 2:51:08PM

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P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-01 D	4/6/20	1305	Plastic 500mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW1	g / c	COD TOC
0041376-01 E	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 226 (sub)
0041376-01 F	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 228 (sub)
0041376-01 G	4/6/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW1	g / c	Radium 228 (sub)
0041376-01 H	4/6/20	1305	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW1	g / c	TOC

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) _____ Time (24 hr) _____

pH 7.22 Cond ~~(umho)~~ 0.867 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 18.29 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-02 A	4/7/20	1140	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 : ✓				
0041376-02 B	4/7/20	1140	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 : ✓				
0041376-02 C	4/7/20	1140	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-02 D	4/7/20	1140	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1140

pH 6.92 Cond ~~(umho)~~ 1.59 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 1686 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ , or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
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Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-02 E	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 226 (sub)
0041376-02 F	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 228 (sub)
0041376-02 G	4/7/20	1140	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW2	g / c	Radium 228 (sub)
0041376-02 H	4/7/20	1140	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW2	g / c	TOC
0041376-03 A	4/7/20	1355	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1140

pH 6.92 Cond (umho) 1.59 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.84 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
_____	_____	4/7/20	1443
_____	_____	4-7-20	1549
_____	_____	_____	_____
_____	_____	_____	_____

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Chain of Custody

Scheduled for: 04/01/2020

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Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-03 B	4/7/20	1355	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 : ✓				
0041376-03 C	4/7/20	1355	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-03 D	4/7/20	1355	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-03 E	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-03 F	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1355

pH 6.86 Cond ~~(umho)~~ 8.09 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.32 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-03 G	4/7/20	1355	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW3A	g / c	Radium 228 (sub)
0041376-03 H	4/7/20	1355	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW3A	g / c	TOC
0041376-04 A	4/7/20	955	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 : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) _____ Time (24 hr) _____

pH 6.86 Cond (~~umho~~) 8.09 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.32 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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PWS ID#:
State: KY

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-04 B	4/7/20	955	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 : ✓				
0041376-04 C	4/7/20	955	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-04 D	4/7/20	955	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-04 E	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-04 F	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 955

pH 6.70 Cond (~~umho~~) 6.77 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-04 G	4/7/20	955	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW4	g / c	Radium 228 (sub)
0041376-04 H	4/7/20	955	AG 250mL pH<2 w/H2SO4 Preservation Check: pH : ✓	1	MW4	g / c	TOC
0041376-05 A	4/7/20	1010	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 : ✓

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 955

pH 6.70 Cond ~~(umho)~~ 6.77 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.47 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
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PO Box 24
Henderson, KY 42419
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Quote# _____

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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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-05 B	4/7/20	1010	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 : ✓				
0041376-05 C	4/7/20	1010	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-05 D	4/7/20	1010	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-05 E	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-05 F	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1010

pH 6.77 ~~Cond (umho)~~ 6.25 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.85 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No

Samples Chlorinated? Yes No

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

Effluent: Start Date ____ Start time ____ End Date ____ End Time ____ Temp (oC) ____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-05 G	4/7/20	1010	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ~	1	MW5	g / c	Radium 228 (sub)
0041376-05 H	4/7/20	1010	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW5	g / c	TOC
0041376-06 A	4/6/20	1420	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 : ✓

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1010

pH 6.77 Cond (~~umho~~) 6.25 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.85 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
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PWS ID#:
State: KY

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Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-06 B	4/6/20	1420	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 : ✓				
0041376-06 C	4/6/20	1420	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-06 D	4/6/20	1420	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-06 E	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-06 F	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1420

pH 6.36 Cond ~~(umho)~~ 5.01 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 20.50 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation
Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

Effluent: Start Date ___ Start time ___ End Date ___ End Time ___ Temp (oC) ___

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-06 G	4/6/20	1420	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW6	g / c	Radium 228 (sub)
0041376-06 H	4/6/20	1420	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW6	g / c	TOC
0041376-07 A	4/7/20	1020	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :** ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/6/20 Time (24 hr) 1420

pH 6.36 Cond ~~(umho)~~ 5.01 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 20.50 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes L 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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-07 B	4/7/20	1020	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 : ✓				
0041376-07 C	4/7/20	1020	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-07 D	4/7/20	1020	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-07 E	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-07 F	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1020

pH 6.70 Cond ~~(umho)~~ 677 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 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)
	Traci Smith	4/7/20	1443
Traci Smith		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-07 G	4/7/20	1020	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	Radium 228 (sub)
0041376-07 H	4/7/20	1020	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	TOC
0041376-08 A	4/7/20	1150	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :** ✓	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 Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1020

pH 6.70 Cond ~~(umho)~~ 6.77 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.47 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1447
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

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Report To:
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Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-08 B	4/7/20	1150	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 : ✓				
0041376-08 C	4/7/20	1150	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-08 D	4/7/20	1150	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-08 E	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-08 F	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1150

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ✓ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-08 G	4/7/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	FIELD BLANK	g / c	Radium 228 (sub)
0041376-08 H	4/7/20	1150	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	FIELD BLANK	g / c	TOC
			HNO3 **Preservation Check: pH :** ____	1			Be 6020 Cadmium Tot 6020 Cadmium Tot 6010B Cobalt Tot 6020 Iron Tot 6020 Antimony 6020 Sodium Tot 6010B

Preservation Check Performed by: CLH

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/7/20 Time (24 hr) 1150

pH _____ Cond (umho) _____ Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) _____ or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/7/20	1443
		4-7-20	1549

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

April 30, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 41376
Pace Project No.: 30358430

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 10, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 41376
Pace Project No.: 30358430

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 41376
Pace Project No.: 30358430

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30358430001	**0041376-01**	Water	04/06/20 13:05	04/10/20 09:15
30358430002	**0041376-02**	Water	04/07/20 11:40	04/10/20 09:15
30358430003	**0041376-03**	Water	04/07/20 13:55	04/10/20 09:15
30358430004	**0041376-04**	Water	04/07/20 09:55	04/10/20 09:15
30358430005	**0041376-05**	Water	04/07/20 10:10	04/10/20 09:15
30358430006	**0041376-06**	Water	04/06/20 14:20	04/10/20 09:15
30358430007	**0041376-07**	Water	04/07/20 10:20	04/10/20 09:15
30358430008	**0041376-08**	Water	04/07/20 11:50	04/10/20 09:15

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 41376
Pace Project No.: 30358430

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30358430001	**0041376-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430002	**0041376-02**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430003	**0041376-03**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430004	**0041376-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430005	**0041376-05**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430006	**0041376-06**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430007	**0041376-07**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30358430008	**0041376-08**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-01 **Lab ID: 30358430001** Collected: 04/06/20 13:05 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.340 ± 0.473 (0.799) C:NA T:94%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.468 ± 0.409 (0.828) C:72% T:87%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.808 ± 0.882 (1.63)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-02 **Lab ID: 30358430002** Collected: 04/07/20 11:40 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.513 ± 0.402 (0.472) C:NA T:88%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.0161 ± 0.343 (0.794) C:70% T:88%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.529 ± 0.745 (1.27)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-03 **Lab ID: 30358430003** Collected: 04/07/20 13:55 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.603 ± 0.577 (0.878) C:NA T:77%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.460 ± 0.444 (0.914) C:68% T:85%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.06 ± 1.02 (1.79)**	pCi/L	04/30/20 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-04 **Lab ID: 30358430004** Collected: 04/07/20 09:55 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.476 ± 0.455 (0.693) C:NA T:95%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.787 ± 0.428 (0.770) C:74% T:84%**	pCi/L	04/28/20 11:04	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.26 ± 0.883 (1.46)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-05 **Lab ID: 30358430005** Collected: 04/07/20 10:10 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.302 ± 0.371 (0.605) C:NA T:95%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.18 ± 0.498 (0.824) C:71% T:90%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.48 ± 0.869 (1.43)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-06 **Lab ID: 30358430006** Collected: 04/06/20 14:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0612 ± 0.279 (0.166) C:NA T:90%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.683 ± 0.478 (0.939) C:68% T:88%**	pCi/L	04/28/20 11:05	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

Sample: 0041376-06 **Lab ID: 30358430006** Collected: 04/06/20 14:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.
• Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.744 ± 0.757 (1.11)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-07 **Lab ID: 30358430007** Collected: 04/07/20 10:20 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.371 ± 0.345 (0.455) C:NA T:83%**	pCi/L	04/30/20 11:27	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.10 ± 0.486 (0.817) C:74% T:84%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.47 ± 0.831 (1.27)**	pCi/L	04/30/20 14:19	7440-14-4	

Sample: 0041376-08 **Lab ID: 30358430008** Collected: 04/07/20 11:50 Received: 04/10/20 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.224 ± 0.515 (0.933) C:NA T:94%**	pCi/L	04/30/20 11:40	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.262 ± 0.427 (0.928) C:74% T:84%**	pCi/L	04/28/20 11:05	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.486 ± 0.942 (1.86)**	pCi/L	04/30/20 14:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

QC Batch: 392089 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: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

METHOD BLANK: 1898525 Matrix: Water
Associated Lab Samples: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.230 ± 0.329 (0.705) C:78% T:76%	pCi/L	04/28/20 11:05	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 41376
Pace Project No.: 30358430

QC Batch: 392088 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: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

METHOD BLANK: 1898523 Matrix: Water
Associated Lab Samples: 30358430001, 30358430002, 30358430003, 30358430004, 30358430005, 30358430006, 30358430007, 30358430008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.176 ± 0.366 (0.660) C:NA T:95%	pCi/L	04/30/20 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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 41376
Pace Project No.: 30358430

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.

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.

SAMPLE QUALIFIERS

Sample: 30358430007

[2] Upon receipt at the laboratory, 5 mls of nitric acid were added to the sample to meet the sample preservation requirement of pH <2 for radiochemistry analysis.

Sample: 30358430008

[1] Sample collection dates and times were not present on the sample containers.

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 41376 Workorder Name: Green Landfill Semiannual Owner Received Date: 4/7/2020 Results Requested By:

Report To:	Subcontract To:	Requested Analysis

McCoy & McCoy Labs
P.O. Box 907
Madisonville, KY 42409
270-821-7375
r.whittington@mccoylabs.com

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
(724) 850-5615

WO# : 30358430

30358430

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix ~~Drinking~~	Preserved Containers					EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY
1													
2	0041376-01		04/06/20 13:05	IR44-McCoy	Water						X	X	001
3	0041376-02		04/07/20 11:40	IR44-McCoy	Water						X	X	002
4	0041376-03		04/07/20 13:55	IR44-McCoy	Water						X	X	003
5	0041376-04		04/07/20 09:55	IR44-McCoy	Water						X	X	004
6	0041376-05		04/07/20 10:10	IR44-McCoy	Water						X	X	005
7	0041376-06		04/06/20 14:20	IR44-McCoy	Water						X	X	006
8	0041376-07		04/07/20 10:20	IR44-McCoy	Water						X	X	007
9	0041376-08		04/07/20 11:50	IR44-McCoy	Water						X	X	008
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			Nicole Rund	4/10/2020 0915	
2					
3					

Cooler Temperature on Receipt 4.7 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0041376

30358430

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:

Please return shipping cooler to return address on shipping label.

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0041376-01	**Water**	**Sampled:04/06/2020 13:05**	**Specific Method**	
Radium 228 (sub)		10/03/2020 13:05	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/03/2020 13:05	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/03/2020 13:05	EPA 903.1	
Sample ID: 0041376-02	**Water**	**Sampled:04/07/2020 11:40**	**Specific Method**	
Radium 226 (sub)		10/04/2020 11:40	EPA 903.1	
Radium 228 (sub)		10/04/2020 11:40	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 11:40	EPA 904.0 Radium Sum C	
Sample ID: 0041376-03	**Water**	**Sampled:04/07/2020 13:55**	**Specific Method**	
Radium Total (sub)		10/04/2020 13:55	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 13:55	EPA 903.1	
Radium 228 (sub)		10/04/2020 13:55	EPA 904.0 Radium Sum C	
Sample ID: 0041376-04	**Water**	**Sampled:04/07/2020 09:55**	**Specific Method**	
Radium 226 (sub)		10/04/2020 09:55	EPA 903.1	
Radium 228 (sub)		10/04/2020 09:55	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 09:55	EPA 904.0 Radium Sum C	
Sample ID: 0041376-05	**Water**	**Sampled:04/07/2020 10:10**	**Specific Method**	
Radium 228 (sub)		10/04/2020 10:10	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 10:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 10:10	EPA 903.1	
Sample ID: 0041376-06	**Water**	**Sampled:04/06/2020 14:20**	**Specific Method**	
Radium 226 (sub)		10/03/2020 14:20	EPA 903.1	
Radium 228 (sub)		10/03/2020 14:20	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/03/2020 14:20	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	04.09.20		
Released By	Date	Received By	Date

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky # 30358430

0041376

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0041376-07	**Water**	**Sampled:04/07/2020 10:20**	**Specific Method**	
Radium 226 (sub)		10/04/2020 10:20	EPA 903.1	
Radium 228 (sub)		10/04/2020 10:20	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/04/2020 10:20	EPA 904.0 Radium Sum C	
Sample ID: 0041376-08	**Water**	**Sampled:04/07/2020 11:50**	**Specific Method**	
Radium Total (sub)		10/04/2020 11:50	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/04/2020 11:50	EPA 903.1	
Radium 228 (sub)		10/04/2020 11:50	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	04.09.20		
Released By	Date	Received By	Date

Sample Custody

30358430

By Nancy Yeager

Printed 04/09/2020 09:05

Lab ID	Container	Cooler	Last Owner	Department	Location	Home Location	Status	Disposition	Custody Date
0041376-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-02	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-02	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-03	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-03	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-04	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-04	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-05	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-05	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-06	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-06	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-07	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-07	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-08	Plastic 1L pH<2 w/HNO3 Rad 226 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05
0041376-08	Plastic 1L pH<2 w/HNO3 Rad 228 (Sefa)	Default Cooler	NDY	Wet Chem	In-Transit		Batched	Active (Out)	04/09/2020 09:05

Relinquished By _____ Date _____ Received By _____ Date _____

Relinquished By _____ Date _____ Received By _____ Date _____

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: McCoy & McCoy Project # # 30358430

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label BLM
LIMS Login BLM

Tracking #: 110733861178

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 5.1 °c Correction Factor: -0.4 °c Final Temp: 4.7 °c

Temp should be above freezing to 6°C

pH paper Lot# 10D0391 Date and Initials of person examining contents: NMR 4/10/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date & time on labels
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. added 5.0mL HNO_3 to each sample
All containers meet method preservation requirements.		✓		Initial when completed: NMR Date/time of preservation: 4/10/2020 1610
				Lot # of added preservative: DL20-0362
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 4/10/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Maneger closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
0043320

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 05/12/2020 13:14

Project Name:	Green Landfill Semiannual Groundwater	Workorder:	0043320

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/17/2020 15:05.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

#460210 Madisonville, KY
#460293 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0043320-01	MW-104/	Groundwater	04/17/2020 09:15	04/17/2020 15:05	Phillip Hill

LabNumber	Measurement	Value
0043320-01	Field Conductance	8930
	Field pH	6.58
	Field Temp (C)	14.73

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

ANALYTICAL RESULTS

Lab Sample ID: **0043320-01**
Description: **MW-104**

Sample Collection Date Time: 04/17/2020 09:15
Sample Received Date Time: 04/17/2020 15:05

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Arsenic	**0.0013**		mg/L	0.0010	0.0004	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Barium	**0.018**		mg/L	0.004	0.001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	04/21/2020 08:00	04/27/2020 11:28	DMH
Boron	**0.21**		mg/L	0.10	0.10	SW846 6010 B	04/21/2020 08:00	04/24/2020 16:00	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Calcium	**527**	D1	mg/L	40.0	13.0	SW846 6010 B	04/21/2020 08:00	04/24/2020 16:06	AKB
Chromium	**0.0020**		mg/L	0.0020	0.0006	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Cobalt	**0.005**		mg/L	0.004	0.004	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Iron	**0.738**		mg/L	0.100	0.050	SW846 6010 B	04/21/2020 08:00	04/24/2020 16:00	AKB
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Lithium	**0.02**		mg/L	0.02	0.005	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Molybdenum	**0.003**	J	mg/L	0.01	0.002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH
Sodium	**861**	D1	mg/L	26.0	10.0	SW846 6010 B	04/21/2020 08:00	04/24/2020 16:06	AKB
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:25	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**86**		mg/L	8	8	HACH 8000	04/27/2020 14:58	04/27/2020 14:58	ALT
Specific Conductance (Lab)	**8600**		umhos/cm	1	1	2510 B-2011	04/20/2020 14:09	04/20/2020 14:09	JLW
pH (Lab)	**6.77**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:38	04/20/2020 14:38	GAT
Total Dissolved Solids	**6320**		mg/L	50	50	2540 C-2011	04/21/2020 10:56	04/22/2020 12:57	MAG
Total Organic Carbon	**0.6**		mg/L	0.5		5310 C-2011	04/24/2020 22:11	04/24/2020 22:11	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.376**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**0.279**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**0.655**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**2630**	D	mg/L	200	128	SW846 9056	04/28/2020 16:15	04/28/2020 16:15	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/28/2020 15:55	04/28/2020 15:55	CSC
Sulfate	**4710**	D	mg/L	100	50	SW846 9056	04/28/2020 16:15	04/28/2020 16:15	CSC

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Notes for work order 0043320

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
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 (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Blank (B017084-BLK1)										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 15:35										
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 (B017084-BLK2)										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:14										
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.001	0.003	mg/L							J
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 (B017084-BS1)										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 15:38										
Boron	0.13	0.10	mg/L	0.125		102	85-115			
Calcium	6.37	0.40	mg/L	6.25		102	85-115			
Iron	6.38	0.100	mg/L	6.25		102	85-115			
Sodium	6.25	0.26	mg/L	6.25		100	85-115			
LCS (B017084-BS2)										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:18										
Antimony	0.068	0.005	mg/L	0.0625		109	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		105	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Arsenic	0.0653	0.0010	mg/L	0.0625		104	85-115			
Barium	0.066	0.004	mg/L	0.0625		106	85-115			
Beryllium	0.0562	0.0020	mg/L	0.0625		89.9	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0662	0.0020	mg/L	0.0625		106	85-115			
Cobalt	0.066	0.004	mg/L	0.0625		106	85-115			
Copper	0.067	0.003	mg/L	0.0625		108	85-115			
Lead	0.060	0.002	mg/L	0.0625		96.7	85-115			
Lithium	0.06	0.02	mg/L	0.0625		98.5	85-115			
Selenium	0.062	0.003	mg/L	0.0625		99.9	85-115			
Thallium	0.0618	0.0020	mg/L	0.0625		98.8	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Matrix Spike (B017084-MS1)	**Source: 0043319-01**									
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:09										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	180	40.0	mg/L	6.25	181	NR	80-120			D2, M2
Iron	10.5	10.0	mg/L	6.25	5.13	86.7	80-120			D2
Sodium	110	26.0	mg/L	6.25	97.2	208	80-120			D2, M1
Matrix Spike (B017084-MS2)	**Source: 0043319-01**									
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:29										
Mercury	0.0026	0.0005	mg/L	0.00250	0.0002	94.7	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	95.1	80-120			
Antimony	0.057	0.005	mg/L	0.0625	ND	91.3	80-120			
Arsenic	0.0582	0.0010	mg/L	0.0625	0.0012	91.2	80-120			
Barium	0.120	0.004	mg/L	0.0625	0.065	89.1	80-120			
Beryllium	0.0459	0.0020	mg/L	0.0625	ND	73.4	80-120			M2
Cadmium	0.0534	0.0010	mg/L	0.0625	ND	85.4	80-120			
Chromium	0.0619	0.0020	mg/L	0.0625	0.0047	91.4	80-120			
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.1	80-120			
Copper	0.055	0.003	mg/L	0.0625	0.001	86.2	80-120			
Lead	0.053	0.002	mg/L	0.0625	0.002	81.8	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.02	81.5	80-120			
Selenium	0.051	0.003	mg/L	0.0625	ND	81.2	80-120			
Thallium	0.0529	0.0020	mg/L	0.0625	ND	84.6	80-120			
Matrix Spike Dup (B017084-MSD1)	**Source: 0043319-01**									
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:13										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	184	40.0	mg/L	6.25	181	51.8	80-120	2.05	20	D2, M2
Iron	11.4	10.0	mg/L	6.25	5.13	101	80-120	8.01	20	D2
Sodium	110	26.0	mg/L	6.25	97.2	210	80-120	0.126	20	D2, M1
Matrix Spike Dup (B017084-MSD2)	**Source: 0043319-01**									
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:48										
Mercury	0.0026	0.0005	mg/L	0.00250	0.0002	94.7	80-120	0.0412	20	
Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	9.71	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	104	80-120	8.98	20	
Arsenic	0.0638	0.0010	mg/L	0.0625	0.0012	100	80-120	9.16	20	
Barium	0.126	0.004	mg/L	0.0625	0.065	99.0	80-120	5.02	20	
Beryllium	0.0505	0.0020	mg/L	0.0625	ND	80.8	80-120	9.61	20	
Cadmium	0.0591	0.0010	mg/L	0.0625	ND	94.6	80-120	10.2	20	
Chromium	0.0673	0.0020	mg/L	0.0625	0.0047	100	80-120	8.47	20	
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	9.76	20	
Copper	0.061	0.003	mg/L	0.0625	0.001	95.6	80-120	10.1	20	
Lead	0.058	0.002	mg/L	0.0625	0.002	90.6	80-120	9.98	20	
Lithium	0.08	0.02	mg/L	0.0625	0.02	91.4	80-120	8.62	20	
Selenium	0.055	0.003	mg/L	0.0625	ND	87.5	80-120	7.40	20	
Thallium	0.0582	0.0020	mg/L	0.0625	ND	93.1	80-120	9.62	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Post Spike (B017084-PS1) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:16										
Boron	649		ug/L	125	536	90.7	75-125			D2
Mercury	2.50		ug/L	2.50	0.212	91.5	75-125			
Antimony	58.4		ug/L	62.5	0.081	93.3	75-125			
Molybdenum	64.4		ug/L	62.5	0.89	102	75-125			
Calcium	183000		ug/L	6250	181000	32.4	75-125			D2, M2
Arsenic	63.5		ug/L	62.5	1.16	99.7	75-125			
Barium	126		ug/L	62.5	64.5	97.9	75-125			
Iron	11300		ug/L	6250	5130	99.2	75-125			D2
Beryllium	50.1		ug/L	62.5	0.169	79.9	75-125			
Cadmium	58.2		ug/L	62.5	0.0110	93.1	75-125			
Chromium	67.0		ug/L	62.5	4.71	99.6	75-125			
Sodium	109000		ug/L	6250	97200	189	75-125			D2, M1
Cobalt	63.8		ug/L	62.5	2.37	98.3	75-125			
Copper	62.7		ug/L	62.5	1.46	97.9	75-125			
Lead	57.6		ug/L	62.5	1.55	89.7	75-115			
Lithium	75.0		ug/L	62.5	18.1	91.1	75-125			
Selenium	54.1		ug/L	62.5	0.048	86.4	75-125			
Thallium	56.9		ug/L	62.5	0.0759	90.9	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017075 - Default Prep Wet Chem										
Blank (B017075-BLK1)										
Prepared: 4/20/2020 13:57, Analyzed: 4/20/2020 13:57										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (B017075-BS1)										
Prepared: 4/20/2020 13:58, Analyzed: 4/20/2020 13:58										
Specific Conductance (Lab)	1340		umhos/cm	1410		94.6	80-120			
Duplicate (B017075-DUP1) **Source: 0043320-01**										
Prepared: 4/20/2020 14:10, Analyzed: 4/20/2020 14:10										
Specific Conductance (Lab)	8590	1	umhos/cm		8600			0.116	1.24	
Batch B017077 - Default Prep Wet Chem										
LCS (B017077-BS1)										
Prepared: 4/20/2020 14:20, Analyzed: 4/20/2020 14:20										
pH (Lab)	8.00		Std. Units	8.00		100	98.8-101.2			
LCS (B017077-BS2)										
Prepared: 4/20/2020 14:35, Analyzed: 4/20/2020 14:35										
pH (Lab)	8.09		Std. Units	8.00		101	98.8-101.2			
Duplicate (B017077-DUP1) **Source: 0042891-06**										
Prepared: 4/20/2020 14:33, Analyzed: 4/20/2020 14:33										
pH (Lab)	6.04	0.10	Std. Units		6.05			0.165	10	
Duplicate (B017077-DUP2) **Source: 0043328-01**										
Prepared: 4/20/2020 14:48, Analyzed: 4/20/2020 14:48										
pH (Lab)	8.16	0.10	Std. Units		8.16			0.00	10	
Batch B017157 - Default Prep Wet Chem										
Blank (B017157-BLK1)										
Prepared: 4/21/2020 10:40, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017157 - Default Prep Wet Chem										
LCS (B017157-BS1)										
Prepared: 4/21/2020 10:44, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	1420	25	mg/L	1500		94.3	80-120			
Duplicate (B017157-DUP1)	**Source: 0043319-01**									
Prepared: 4/21/2020 11:04, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	1100	50	mg/L		1150			4.27	10	
Batch B017536 - Default Prep Wet Chem										
Blank (B017536-BLK1)										
Prepared: 4/24/2020 13:45, Analyzed: 4/24/2020 13:45										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B017536-BS1)										
Prepared: 4/24/2020 14:09, Analyzed: 4/24/2020 14:09										
Total Organic Carbon	5.0	0.5	mg/L	5.00		99.8	80-120			
Duplicate (B017536-DUP1)	**Source: 0041593-01**									
Prepared: 4/24/2020 19:53, Analyzed: 4/24/2020 19:53										
Total Organic Carbon	1.9	0.5	mg/L		1.9			1.50	25	
Duplicate (B017536-DUP2)	**Source: 0043407-01**									
Prepared: 4/25/2020 0:29, Analyzed: 4/25/2020 0:29										
Total Organic Carbon	0.3	0.5	mg/L		ND				25	U
Matrix Spike (B017536-MS1)	**Source: 0041593-02**									
Prepared: 4/24/2020 20:16, Analyzed: 4/24/2020 20:16										
Total Organic Carbon	3.7	0.5	mg/L	2.50	1.3	96.6	80-120			
Matrix Spike (B017536-MS2)	**Source: 0043428-01**									
Prepared: 4/25/2020 0:52, Analyzed: 4/25/2020 0:52										
Total Organic Carbon	5.2	0.5	mg/L	5.00	0.3	103	80-120			
Batch B018079 - Default Prep Wet Chem										
Blank (B018079-BLK1)										
Prepared: 4/27/2020 14:48, Analyzed: 4/27/2020 14:48										
Chemical Oxygen Demand	ND	8	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B018079 - Default Prep Wet Chem										
LCS (B018079-BS1)										
Prepared: 4/27/2020 14:48, Analyzed: 4/27/2020 14:48										
Chemical Oxygen Demand	117	8	mg/L				90-110			
Duplicate (B018079-DUP1)	**Source: 0042065-02**									
Prepared: 4/27/2020 15:00, Analyzed: 4/27/2020 15:00										
Chemical Oxygen Demand	ND	8	mg/L		9				25	U
Matrix Spike (B018079-MS1)	**Source: 0042065-02**									
Prepared: 4/27/2020 15:00, Analyzed: 4/27/2020 15:00										
Chemical Oxygen Demand	271	8	mg/L	250	9	105	90-110			
Matrix Spike Dup (B018079-MSD1)	**Source: 0042065-02**									
Prepared: 4/27/2020 15:00, Analyzed: 4/27/2020 15:00										
Chemical Oxygen Demand	261	8	mg/L	250	9	101	90-110	3.58	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B018057 - Default Prep IC										
Blank (B018057-BLK1)										
Prepared: 4/28/2020 10:29, Analyzed: 4/28/2020 10:29										
Fluoride	ND	0.2	mg/L							U
Chloride	ND	2.0	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B018057-BS1)										
Prepared: 4/28/2020 10:08, Analyzed: 4/28/2020 10:08										
Fluoride	9.5		mg/L	10.0		95.1	90-110			
Chloride	9.6		mg/L	10.0		95.8	90-110			
Sulfate	10		mg/L	10.0		97.5	90-110			
Matrix Spike (B018057-MS1) **Source: 0043294-10**										
Prepared: 4/28/2020 13:52, Analyzed: 4/28/2020 13:52										
Chloride	409		mg/L	500	6.0	80.6	75-125			D
Fluoride	410		mg/L	500	5.6	80.9	75-125			D
Sulfate	2510		mg/L	500	1770	147	75-125			D, M1
Matrix Spike Dup (B018057-MSD1) **Source: 0043294-10**										
Prepared: 4/28/2020 14:13, Analyzed: 4/28/2020 14:13										
Chloride	432		mg/L	500	6.0	85.1	75-125	5.30	15	D
Fluoride	422		mg/L	500	5.6	83.3	75-125	2.93	15	D
Sulfate	2560		mg/L	500	1770	157	75-125	1.95	15	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030)
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
SW846 6010 B in Water	

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Sample Acceptance Checklist for Work Order 0043320

Shipped By: Client

Temperature: 0.60° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
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Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation
Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419

Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419

PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes Y 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) ____

MMLI USE ONLY
Workorder #
0041376

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-08 G			Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :**	1	FIELD BLANK	g / c	Radium 228 (sub)
0041376-08 H			AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :**	1	FIELD BLANK	g / c	TOC
0041376-09 A	4/17/20	0915	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :**	1	MW-104	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

0043320

AcI 0417 20

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/17/20 Time (24 hr) 0915

pH 6.58 Cond ~~(umho)~~ mS/cm 8.93 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.73 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/17/20	1505

☐ **PACE- Check here if trip charge applied to associated COC**

0.6

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): K. Mills
required information

Compliance Monitoring? Yes X 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) _____

MMLI USE ONLY Workorder # 0041376 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-09 B	4/17/20	0915	Plastic 500mL pH<2 w/HNO3	1	MW-104	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 : ✓				
0041376-09 C	4/17/20	0915	Plastic 1L	1	MW-104	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0041376-09 D	4/17/20	0915	Plastic 500mL pH<2 w/H2SO4	1	MW-104	g / c	COD TOC
			Preservation Check: pH : ✓				
0041376-09 E	4/17/20	0915	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-104	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0041376-09 F	4/17/20	0915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

0043320

Ael 041720

Preservation Check Performed by: All

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/17/20 Time (24 hr) 0915

pH 6.58 Cond ~~(umho)~~ mS/cm 8.93 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.73 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)
K. Mills	Abby Lauprie	4/17/20	1505

☐ PACE- Check here if trip charge applied to associated COC

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): D. Mott
required information

Compliance Monitoring? Yes X 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) ____

MMLI USE ONLY **Workorder # 0041376**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041376-09 G	4/17/20	0915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	MW-104	g / c	Radium 228 (sub)
0041376-09 H	4/17/20	0915	AG 250mL pH<2 w/H2SO4 **Preservation Check: pH :** ✓	1	MW-104	g / c	TOC

0043320

AM 041720

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/17/20 Time (24 hr) 0915

pH 6.58 Cond ~~(umho)~~ 8.93 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.77 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)
D. Mott	Abbey Rankin	4/17/20	1505

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 3/25/2020 2:51:08PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 12, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30359746001	**0043320-01**	Water	04/17/20 09:15	04/21/20 09:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30359746001	**0043320-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

Sample: 0043320-01 **Lab ID: 30359746001** Collected: 04/17/20 09:15 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.376 ± 0.350 (0.462) C:NA T:94%**	pCi/L	05/11/20 14:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.279 ± 0.343 (0.727) C:74% T:93%**	pCi/L	05/07/20 14:12	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.655 ± 0.693 (1.19)**	pCi/L	05/12/20 08:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

QC Batch: 393303
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30359746001

METHOD BLANK: 1905202 Matrix: Water
Associated Lab Samples: 30359746001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.262 ± 0.244 (0.656) C:NA T:91%	pCi/L	05/11/20 14:21	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

QC Batch: 393304
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30359746001

METHOD BLANK: 1905203 Matrix: Water
Associated Lab Samples: 30359746001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.223 ± 0.355 (0.769) C:79% T:81%	pCi/L	05/07/20 14:09	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 43320 Green Landfill Semiannua
Pace Project No.: 30359746

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.

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.

WO# : 30359746

30359746

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 43320 Workorder Name: Green Landfill Semiannual Owner Received Date: 4/17/2020 Results Requested By:

Report To:	Subcontract To:
McCoy & McCoy Labs P.O. Box 907 Madisonville, KY 42409 270-821-7375 r.whittington@mccoylabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	0043320-01		04/17/20 09:15	IR44-McCoy	Water		X	X	001
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			Nicole Turner	4/21/2020 930	
2					
3					

Cooler Temperature on Receipt 3.5 °C | **Custody Seal Y or N** | **Received on Ice Y or N** | **Sample Intact Y or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0043320

30359746

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:

Please return shipping cooler to return address on shipping label.

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0043320-01	**Water**	**Sampled:04/17/2020 09:15**	**Specific Method**	
Radium Total (sub)		10/14/2020 09:15	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/14/2020 09:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/14/2020 09:15	EPA 903.1	

Released By	Date	Received By	Date
Mary Cooper	04-20-20		
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: McCoy & McCoy Project #: #_30359746

Label: NMR
LIMS Login: NMR

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 110733861557

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals Intact: ☐ yes ☐ no

Thermometer Used: 11 Type of Ice: (Wet) Blue None

Cooler Temperature: Observed Temp 3.9 °C Correction Factor: -0.4 °C Final Temp: 3.5 °C

Temp should be above freezing to 6°C

pH paper Lot#: 10D4191 Date and Initials of person examining contents: NMR 4/21/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date & time on labels
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: NMR Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 4/21/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
0084068

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 10/26/2020 09:39

Project Name:	Green Landfill Semiannual Groundwater	Workorder:	0084068

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 09/23/2020 12:45.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0084068-01	MW1/	Groundwater	09/22/2020 10:09	09/23/2020 12:45	Phillip Hill
0084068-02	MW2/	Groundwater	09/22/2020 15:55	09/23/2020 12:45	Phillip Hill
0084068-03	MW3A/	Groundwater	09/22/2020 14:47	09/23/2020 12:45	Phillip Hill
0084068-04	MW4/	Groundwater	09/22/2020 13:48	09/23/2020 12:45	Phillip Hill
0084068-05	MW5/	Groundwater	09/22/2020 12:48	09/23/2020 12:45	Phillip Hill
0084068-06	MW6/	Groundwater	09/22/2020 11:35	09/23/2020 12:45	Phillip Hill
0084068-07	DUPLICATE/	Groundwater	09/22/2020 11:50	09/23/2020 12:45	Phillip Hill
0084068-08	FIELD BLANK/	Water	09/22/2020 16:15	09/23/2020 12:45	Phillip Hill

LabNumber	Measurement	Value
0084068-01	Field Conductance	661
	Field pH	6.88
	Field Temp (C)	17.50
0084068-02	Field Conductance	1250
	Field pH	6.22
	Field Temp (C)	17.57
0084068-03	Field Conductance	6070
	Field pH	6.61
	Field Temp (C)	16.77
0084068-04	Field Conductance	4820
	Field pH	6.64
	Field Temp (C)	17.43
0084068-05	Field Conductance	4480
	Field pH	6.52
	Field Temp (C)	17.61
0084068-06	Field Conductance	3740
	Field pH	6.32
	Field Temp (C)	18.70
0084068-07	Field Conductance	3740
	Field pH	6.32
	Field Temp (C)	18.70

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

ANALYTICAL RESULTS

Lab Sample ID: **0084068-01**
Description: **MW1**

Sample Collection Date Time: 09/22/2020 10:09
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Barium	**0.077**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Boron	**1.66**	D2, M4	mg/L	1.00	1.00	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:01	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Calcium	**26.4**	D2	mg/L	4.00	1.30	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:01	dmh
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 10:57	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Lithium	ND	M1, U	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 15:48	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH
Sodium	**195**	D1, M2	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:04	dmh
Thallium	**0.0001**	J	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:22	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	5	5	HACH 8000	09/24/2020 14:43	09/24/2020 14:43	HMF
Specific Conductance (Lab)	**967**		umhos/cm	1	1	2510 B-2011	09/24/2020 14:58	09/24/2020 14:58	JLW
pH (Lab)	**7.60**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:18	09/24/2020 14:18	GAT
Total Dissolved Solids	**388**		mg/L	50	50	2540 C-2011	09/24/2020 15:06	09/25/2020 16:00	MAG
Total Organic Carbon	**1.2**		mg/L	0.5		5310 C-2011	10/09/2020 11:29	10/09/2020 11:29	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.059**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.505**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.564**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**6.6**		mg/L	2.0	1.3	SW846 9056	09/30/2020 09:35	09/30/2020 09:35	CSC
Fluoride	**0.6**		mg/L	0.2	0.1	SW846 9056	09/30/2020 09:35	09/30/2020 09:35	CSC
Sulfate	**24**		mg/L	1	0.5	SW846 9056	09/30/2020 09:35	09/30/2020 09:35	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-02**
Description: **MW2**

Sample Collection Date Time: 09/22/2020 15:55
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Arsenic	**0.0095**		mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Barium	**0.336**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:03	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Calcium	**157**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:20	dmh
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Iron	**6.11**	D1	mg/L	1.00	0.500	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:17	dmh
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Lithium	**0.006**	V1, J	mg/L	0.02	0.005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Molybdenum	**0.002**	J	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH
Sodium	**55.6**	D2	mg/L	2.60	1.00	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:17	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:26	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**14**		mg/L	5	5	HACH 8000	09/24/2020 14:43	09/24/2020 14:43	HMF
Specific Conductance (Lab)	**1650**		umhos/cm	1	1	2510 B-2011	09/24/2020 14:59	09/24/2020 14:59	JLW
pH (Lab)	**6.88**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:19	09/24/2020 14:19	GAT
Total Dissolved Solids	**914**		mg/L	50	50	2540 C-2011	09/24/2020 15:10	09/25/2020 16:00	MAG
Total Organic Carbon	**1.7**		mg/L	0.5		5310 C-2011	10/09/2020 11:50	10/09/2020 11:50	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.208**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.285**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.493**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**231**	D	mg/L	100	64.0	SW846 9056	10/01/2020 15:54	10/01/2020 15:54	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	09/30/2020 10:06	09/30/2020 10:06	CSC
Sulfate	**117**	D	mg/L	100	50	SW846 9056	09/30/2020 10:21	09/30/2020 10:21	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-03**
Description: **MW3A**

Sample Collection Date Time: 09/22/2020 14:47
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Barium	**0.043**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Boron	**0.28**		mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:10	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Calcium	**423**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:26	dmh
Chromium	**0.0006**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Cobalt	**0.004**		mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Iron	**0.300**		mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:10	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Lithium	**0.80**	D2	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 15:52	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH
Sodium	**325**	D1	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:26	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:29	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**99**		mg/L	5	5	HACH 8000	09/24/2020 15:14	09/24/2020 15:14	HMF
Specific Conductance (Lab)	**7750**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:00	09/24/2020 15:00	JLW
pH (Lab)	**6.95**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:20	09/24/2020 14:20	GAT
Total Dissolved Solids	**5680**		mg/L	50	50	2540 C-2011	09/24/2020 15:14	09/25/2020 16:00	MAG
Total Organic Carbon	**0.8**		mg/L	0.5		5310 C-2011	10/09/2020 12:11	10/09/2020 12:11	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.640**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.869**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1200**	D	mg/L	200	128	SW846 9056	09/30/2020 10:52	09/30/2020 10:52	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	09/30/2020 10:36	09/30/2020 10:36	CSC
Sulfate	**1830**	D	mg/L	100	50	SW846 9056	10/20/2020 09:52	10/20/2020 09:52	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-04**
Description: **MW4**

Sample Collection Date Time: 09/22/2020 13:48
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Barium	**0.031**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Beryllium	ND	D2, U	mg/L	0.0040	0.0020	SW846-6020 A	09/24/2020 07:39	10/21/2020 11:39	CAM
Boron	**1.70**	D2	mg/L	1.00	1.00	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:30	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Calcium	**823**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:33	dmh
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:26	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Lithium	**1.73**	D2	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 15:56	DMH
Mercury	**0.0003**	J	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH
Sodium	**280**	D1	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:33	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:33	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**126**		mg/L	5	5	HACH 8000	09/24/2020 15:14	09/24/2020 15:14	HMF
Specific Conductance (Lab)	**6180**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:01	09/24/2020 15:01	JLW
pH (Lab)	**7.05**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:21	09/24/2020 14:21	GAT
Total Dissolved Solids	**4470**		mg/L	50	50	2540 C-2011	09/24/2020 15:18	09/25/2020 16:00	MAG
Total Organic Carbon	**0.7**	M2	mg/L	0.5		5310 C-2011	10/09/2020 12:32	10/09/2020 12:32	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.111**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.766**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.877**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**2030**	D	mg/L	200	128	SW846 9056	10/20/2020 10:38	10/20/2020 10:38	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	09/30/2020 11:07	09/30/2020 11:07	CSC
Sulfate	**2080**	D	mg/L	100	50	SW846 9056	10/20/2020 10:38	10/20/2020 10:38	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-05**
Description: **MW5**

Sample Collection Date Time: 09/22/2020 12:48
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Barium	**0.014**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Beryllium	ND	D2, U	mg/L	0.0040	0.0020	SW846-6020 A	09/24/2020 07:39	10/21/2020 11:53	CAM
Boron	**0.24**		mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:32	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Calcium	**495**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:39	dmh
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:32	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Lithium	**0.42**	D2	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 15:59	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH
Sodium	**215**	D1	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:39	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:36	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**80**		mg/L	5	5	HACH 8000	09/24/2020 14:44	09/24/2020 14:44	HMF
Specific Conductance (Lab)	**5950**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:02	09/24/2020 15:02	JLW
pH (Lab)	**6.91**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:22	09/24/2020 14:22	GAT
Total Dissolved Solids	**5170**		mg/L	50	50	2540 C-2011	09/24/2020 15:22	09/25/2020 16:00	MAG
Total Organic Carbon	**0.8**		mg/L	0.5		5310 C-2011	10/09/2020 12:53	10/09/2020 12:53	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.109**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**1.57**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**1.68**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**1800**	D	mg/L	200	128	SW846 9056	10/20/2020 11:24	10/20/2020 11:24	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	09/30/2020 11:38	09/30/2020 11:38	CSC
Sulfate	**973**	D	mg/L	100	50	SW846 9056	09/30/2020 11:54	09/30/2020 11:54	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-06**
Description: **MW6**

Sample Collection Date Time: 09/22/2020 11:35
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Barium	**0.011**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Boron	**0.19**		mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:38	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Calcium	**417**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:55	dmh
Chromium	**0.0006**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:38	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Lithium	**0.05**	D2, J	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 16:03	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH
Sodium	**446**	D1	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 16:55	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:54	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**15**		mg/L	5	5	HACH 8000	09/24/2020 14:44	09/24/2020 14:44	HMF
Specific Conductance (Lab)	**4950**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:03	09/24/2020 15:03	JLW
pH (Lab)	**6.81**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:23	09/24/2020 14:23	GAT
Total Dissolved Solids	**4740**		mg/L	50	50	2540 C-2011	09/24/2020 15:26	09/25/2020 16:00	MAG
Total Organic Carbon	**2.4**		mg/L	0.5		5310 C-2011	10/09/2020 13:14	10/09/2020 13:14	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**-0.382**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.380**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.380**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**286**	D	mg/L	40.0	25.6	SW846 9056	10/01/2020 16:10	10/01/2020 16:10	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	09/30/2020 12:40	09/30/2020 12:40	CSC
Sulfate	**2380**	D, H2	mg/L	200	100	SW846 9056	10/22/2020 13:05	10/22/2020 13:05	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-07**
Description: **DUPLICATE**

Sample Collection Date Time: 09/22/2020 11:50
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Barium	**0.012**		mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Beryllium	ND	D2, U	mg/L	0.0040	0.0020	SW846-6020 A	09/24/2020 07:39	10/21/2020 12:25	CAM
Boron	**0.18**		mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:44	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Calcium	**392**	D1	mg/L	40.0	13.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:01	dmh
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	10/20/2020 11:44	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Lithium	**0.05**	D2, J	mg/L	0.20	0.05	SW846-6020 A	09/24/2020 07:39	09/30/2020 16:06	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH
Sodium	**441**	D1	mg/L	26.0	10.0	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:01	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 17:58	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**19**		mg/L	5	5	HACH 8000	09/24/2020 14:44	09/24/2020 14:44	HMF
Specific Conductance (Lab)	**4960**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:06	09/24/2020 15:06	JLW
pH (Lab)	**6.82**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:24	09/24/2020 14:24	GAT
Total Dissolved Solids	**4430**		mg/L	50	50	2540 C-2011	09/24/2020 15:30	09/25/2020 16:00	MAG
Total Organic Carbon	**2.4**		mg/L	0.5		5310 C-2011	10/09/2020 13:35	10/09/2020 13:35	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**-0.119**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.510**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.510**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**389**	D	mg/L	200	128	SW846 9056	09/29/2020 19:02	09/29/2020 19:02	KJL
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	09/29/2020 18:46	09/29/2020 18:46	KJL
Sulfate	**2370**	D, H2	mg/L	200	100	SW846 9056	10/22/2020 12:19	10/22/2020 12:19	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0084068-08**
Description: **FIELD BLANK**

Sample Collection Date Time: 09/22/2020 16:15
Sample Received Date Time: 09/23/2020 12:45

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/24/2020 07:39	10/01/2020 10:59	CAM
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:04	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:04	dmh
Chromium	**0.0008**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Copper	**0.001**	J	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Iron	ND	U	mg/L	0.100	0.050	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:04	dmh
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Lithium	ND	V1, U	mg/L	0.02	0.005	SW846-6020 A	09/24/2020 07:39	10/01/2020 10:59	CAM
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH
Sodium	**0.10**	J	mg/L	0.26	0.10	SW846 6010 B	09/24/2020 07:39	09/24/2020 17:04	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/24/2020 07:39	09/29/2020 18:02	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	ND	U	mg/L	5	5	HACH 8000	09/24/2020 14:44	09/24/2020 14:44	HMF
Specific Conductance (Lab)	**78**		umhos/cm	1	1	2510 B-2011	09/24/2020 15:07	09/24/2020 15:07	JLW
pH (Lab)	**6.82**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/24/2020 14:25	09/24/2020 14:25	GAT
Total Dissolved Solids	**146**		mg/L	50	50	2540 C-2011	09/29/2020 15:48	09/30/2020 15:45	MAG
Total Organic Carbon	ND	U	mg/L	0.5		5310 C-2011	10/09/2020 13:56	10/09/2020 13:56	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**-0.189**	_Sub	pCi/L			EPA 903.1	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium-228	**0.429**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 10:12	10/13/2020 10:13	xxx
Radium	**0.429**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/15/2020 10:12	10/15/2020 10:13	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	2.0	1.3	SW846 9056	09/30/2020 16:31	09/30/2020 16:31	CSC
Fluoride	ND	M1, Y2, U	mg/L	0.2	0.1	SW846 9056	09/30/2020 16:31	09/30/2020 16:31	CSC
Sulfate	ND	M1, Y2, U	mg/L	1	0.5	SW846 9056	09/30/2020 16:31	09/30/2020 16:31	CSC

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Notes for work order 0084068

- 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.
H1	Sample analysis performed past holding time.
H2	Initial analysis within holding time. Reanalysis was 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.
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 (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/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Results relate only to the items tested.

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039300 - EPA 200.2										
Blank (B039300-BLK1)										
Prepared: 9/24/2020 7:39, Analyzed: 9/24/2020 15:55										
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 (B039300-BLK2)										
Prepared: 9/24/2020 7:39, Analyzed: 9/29/2020 17:15										
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
LCS (B039300-BS1)										
Prepared: 9/24/2020 7:39, Analyzed: 9/24/2020 15:58										
Boron	0.13	0.10	mg/L	0.125		102	85-115			
Calcium	6.18	0.40	mg/L	6.25		98.9	85-115			
Iron	6.09	0.100	mg/L	6.25		97.4	85-115			
Sodium	6.06	0.26	mg/L	6.25		97.0	85-115			
LCS (B039300-BS2)										
Prepared: 9/24/2020 7:39, Analyzed: 9/29/2020 17:18										
Molybdenum	0.06	0.01	mg/L	0.0625		103	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		104	85-115			
Antimony	0.068	0.005	mg/L	0.0625		108	85-115			
Arsenic	0.0629	0.0010	mg/L	0.0625		101	85-115			
Barium	0.062	0.004	mg/L	0.0625		99.3	85-115			
Beryllium	0.0674	0.0020	mg/L	0.0625		108	85-115			
Cadmium	0.0633	0.0010	mg/L	0.0625		101	85-115			
Chromium	0.0642	0.0020	mg/L	0.0625		103	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		102	85-115			
Copper	0.064	0.003	mg/L	0.0625		102	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.07	0.02	mg/L	0.0625		108	85-115			
Selenium	0.065	0.003	mg/L	0.0625		105	85-115			
Thallium	0.0644	0.0020	mg/L	0.0625		103	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039300 - EPA 200.2										
Matrix Spike (B039300-MS1) **Source: 0084068-01**										
Prepared: 9/24/2020 7:39, Analyzed: 9/24/2020 17:07										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	31.7	40.0	mg/L	6.25	26.4	84.3	80-120			D2, J
Iron	5.93	10.0	mg/L	6.25	ND	94.9	80-120			D2, J
Sodium	195	26.0	mg/L	6.25	195	6.37	80-120			D2, M2
Matrix Spike (B039300-MS2) **Source: 0084068-01**										
Prepared: 9/24/2020 7:39, Analyzed: 9/29/2020 18:05										
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120			
Mercury	0.0024	0.0005	mg/L	0.00250	ND	95.7	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	102	80-120			
Arsenic	0.0613	0.0010	mg/L	0.0625	ND	98.1	80-120			
Barium	0.143	0.004	mg/L	0.0625	0.077	106	80-120			
Beryllium	0.0647	0.0020	mg/L	0.0625	ND	104	80-120			
Cadmium	0.0586	0.0010	mg/L	0.0625	ND	93.7	80-120			
Chromium	0.0645	0.0020	mg/L	0.0625	ND	103	80-120			
Cobalt	0.062	0.004	mg/L	0.0625	ND	99.0	80-120			
Copper	0.062	0.003	mg/L	0.0625	ND	98.4	80-120			
Lead	0.058	0.002	mg/L	0.0625	ND	93.0	80-120			
Lithium	0.10	0.02	mg/L	0.0625	0.03	123	80-120			M1
Selenium	0.058	0.003	mg/L	0.0625	ND	93.2	80-120			
Thallium	0.0591	0.0020	mg/L	0.0625	0.0001	94.6	80-120			
Matrix Spike Dup (B039300-MSD1) **Source: 0084068-01**										
Prepared: 9/24/2020 7:39, Analyzed: 9/24/2020 17:11										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	33.4	40.0	mg/L	6.25	26.4	113	80-120	5.41	20	D2, J
Iron	6.43	10.0	mg/L	6.25	ND	103	80-120	8.10	20	D2, J
Sodium	201	26.0	mg/L	6.25	195	96.2	80-120	2.83	20	D2
Matrix Spike Dup (B039300-MSD2) **Source: 0084068-01**										
Prepared: 9/24/2020 7:39, Analyzed: 9/29/2020 18:09										
Mercury	0.0024	0.0005	mg/L	0.00250	ND	95.4	80-120	0.278	20	
Antimony	0.068	0.005	mg/L	0.0625	ND	109	80-120	2.33	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120	2.03	20	
Arsenic	0.0634	0.0010	mg/L	0.0625	ND	101	80-120	3.41	20	
Barium	0.144	0.004	mg/L	0.0625	0.077	108	80-120	0.848	20	
Beryllium	0.0677	0.0020	mg/L	0.0625	ND	108	80-120	4.51	20	
Cadmium	0.0600	0.0010	mg/L	0.0625	ND	95.9	80-120	2.32	20	
Chromium	0.0663	0.0020	mg/L	0.0625	ND	106	80-120	2.77	20	
Cobalt	0.063	0.004	mg/L	0.0625	ND	101	80-120	2.45	20	
Copper	0.059	0.003	mg/L	0.0625	ND	94.3	80-120	4.29	20	
Lead	0.059	0.002	mg/L	0.0625	ND	95.0	80-120	2.18	20	
Lithium	0.11	0.02	mg/L	0.0625	0.03	124	80-120	0.606	20	M1
Selenium	0.061	0.003	mg/L	0.0625	ND	97.8	80-120	4.83	20	
Thallium	0.0612	0.0020	mg/L	0.0625	0.0001	97.9	80-120	3.43	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039300 - EPA 200.2										
Post Spike (B039300-PS1)	**Source: 0084068-01**									
Prepared: 9/24/2020 7:39, Analyzed: 9/24/2020 17:14										
Boron	1800		ug/L	125	1660	116	75-125			D2
Calcium	32300		ug/L	6250	26400	95.1	75-125			D2
Iron	5970		ug/L	6250	26.3	95.1	75-125			D2
Sodium	199000		ug/L	6250	195000	65.3	75-125			D2, M2
Post Spike (B039300-PS2)	**Source: 0084068-01**									
Prepared: 9/24/2020 7:39, Analyzed: 9/29/2020 18:12										
Antimony	65.8		ug/L	62.5	0.119	105	75-125			
Mercury	2.43		ug/L	2.50	0.0195	96.2	75-125			
Molybdenum	64.8		ug/L	62.5	1.11	102	75-125			
Arsenic	61.8		ug/L	62.5	0.314	98.4	75-125			
Barium	148		ug/L	62.5	76.8	114	75-125			
Beryllium	67.2		ug/L	62.5	0.0017	108	75-125			
Cadmium	59.6		ug/L	62.5	0.0334	95.3	75-125			
Chromium	66.0		ug/L	62.5	0.386	105	75-125			
Cobalt	63.3		ug/L	62.5	0.103	101	75-125			
Copper	58.0		ug/L	62.5	-1.74	92.7	75-125			
Lead	58.9		ug/L	62.5	-0.019	94.2	75-115			
Lithium	107		ug/L	62.5	27.8	127	75-125			M1
Selenium	58.6		ug/L	62.5	0.038	93.7	75-125			
Thallium	60.6		ug/L	62.5	0.0972	96.8	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039409 - Default Prep Wet Chem										
LCS (B039409-BS1)										
Prepared: 9/24/2020 14:16, Analyzed: 9/24/2020 14:16										
pH (Lab)	8.02		Std. Units	8.00		100	98.8-101.2			
Duplicate (B039409-DUP1) **Source: 0084068-08**										
Prepared: 9/24/2020 14:27, Analyzed: 9/24/2020 14:27										
pH (Lab)	6.81	0.10	Std. Units		6.82			0.147	10	
Batch B039411 - Filter Wet Chemistry then Digest										
Blank (B039411-BLK1)										
Prepared: 9/24/2020 14:56, Analyzed: 9/24/2020 14:56										
Specific Conductance (Lab)	ND	1	umhos/cm							U
LCS (B039411-BS1)										
Prepared: 9/24/2020 14:57, Analyzed: 9/24/2020 14:57										
Specific Conductance (Lab)	1400		umhos/cm	1410		98.9	80-120			
Duplicate (B039411-DUP1) **Source: 0093255-02**										
Prepared: 9/24/2020 15:18, Analyzed: 9/24/2020 15:18										
Specific Conductance (Lab)	816	1	umhos/cm		819			0.367	1.24	
Duplicate (B039411-DUP2) **Source: 0093381-01**										
Prepared: 9/24/2020 15:29, Analyzed: 9/24/2020 15:29										
Specific Conductance (Lab)	2690	1	umhos/cm		2690			0.00	1.24	
Batch B039417 - Default Prep Wet Chem										
Blank (B039417-BLK1)										
Prepared: 9/24/2020 14:39, Analyzed: 9/24/2020 14:39										
Chemical Oxygen Demand	ND	5	mg/L							U
LCS (B039417-BS1)										
Prepared: 9/24/2020 14:39, Analyzed: 9/24/2020 14:39										
Chemical Oxygen Demand	119	5	mg/L	125		95.2	90-110			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039417 - Default Prep Wet Chem										
Duplicate (B039417-DUP1) **Source: 0093507-01**										
Prepared: 9/24/2020 14:47, Analyzed: 9/24/2020 14:47										
Chemical Oxygen Demand	29	5	mg/L		30			3.46	25	
Matrix Spike (B039417-MS1) **Source: 0093507-01**										
Prepared: 9/24/2020 14:47, Analyzed: 9/24/2020 14:47										
Chemical Oxygen Demand	271	5	mg/L	250	30	96.6	90-110			
Matrix Spike Dup (B039417-MSD1) **Source: 0093507-01**										
Prepared: 9/24/2020 14:47, Analyzed: 9/24/2020 14:47										
Chemical Oxygen Demand	269	5	mg/L	250	30	95.8	90-110	0.764	10	
Batch B039418 - Default Prep Wet Chem										
Blank (B039418-BLK1)										
Prepared: 9/24/2020 14:58, Analyzed: 9/25/2020 16:00										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B039418-BS1)										
Prepared: 9/24/2020 15:02, Analyzed: 9/25/2020 16:00										
Total Dissolved Solids	1340	25	mg/L	1500		89.3	80-120			
Duplicate (B039418-DUP1) **Source: 0084068-01**										
Prepared: 9/24/2020 16:22, Analyzed: 9/25/2020 16:00										
Total Dissolved Solids	414	50	mg/L		388			6.48	10	
Duplicate (B039418-DUP2) **Source: 0093489-01**										
Prepared: 9/24/2020 6:26, Analyzed: 9/25/2020 16:00										
Total Dissolved Solids	684	50	mg/L		704			2.88	10	
Batch B040217 - Default Prep Wet Chem										
Blank (B040217-BLK1)										
Prepared: 9/29/2020 15:32, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040217 - Default Prep Wet Chem										
LCS (B040217-BS1)										
Prepared: 9/29/2020 15:36, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	1310	25	mg/L	1500		87.6	80-120			
Duplicate (B040217-DUP1)	**Source: 0084065-01**									
Prepared: 9/29/2020 17:00, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	118	50	mg/L		114			3.45	10	
Duplicate (B040217-DUP2)	**Source: 0093702-01**									
Prepared: 9/29/2020 17:04, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	352	50	mg/L		354			0.567	10	
Batch B041405 - Default Prep Wet Chem										
Blank (B041405-BLK1)										
Prepared: 10/9/2020 10:26, Analyzed: 10/9/2020 10:26										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B041405-BS1)										
Prepared: 10/9/2020 10:05, Analyzed: 10/9/2020 10:05										
Total Organic Carbon	4.8	0.5	mg/L	5.00		95.8	80-120			
Duplicate (B041405-DUP1)	**Source: 0084068-03**									
Prepared: 10/9/2020 15:42, Analyzed: 10/9/2020 15:42										
Total Organic Carbon	0.7	0.5	mg/L		0.8			4.30	25	
Duplicate (B041405-DUP2)	**Source: 0084068-05**									
Prepared: 10/9/2020 20:58, Analyzed: 10/9/2020 20:58										
Total Organic Carbon	0.8	0.5	mg/L		0.8			3.87	25	
Matrix Spike (B041405-MS1)	**Source: 0084068-04**									
Prepared: 10/9/2020 16:03, Analyzed: 10/9/2020 16:03										
Total Organic Carbon	2.5	0.5	mg/L	2.50	0.7	69.9	80-120			M2
Matrix Spike (B041405-MS2)	**Source: 0084068-06**									
Prepared: 10/9/2020 21:19, Analyzed: 10/9/2020 21:19										
Total Organic Carbon	7.2	0.5	mg/L	5.00	2.4	95.6	80-120			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040214 - Default Prep IC										
Blank (B040214-BLK1)										
Prepared: 9/29/2020 18:31, Analyzed: 9/29/2020 18:31										
Fluoride	ND	0.2	mg/L							U
Chloride	ND	2.0	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B040214-BS1)										
Prepared: 9/29/2020 18:16, Analyzed: 9/29/2020 18:16										
Chloride	9.9		mg/L	10.0		99.1	90-110			
Fluoride	9.6		mg/L	10.0		95.8	90-110			
Sulfate	10		mg/L	10.0		98.8	90-110			
Matrix Spike (B040214-MS1) **Source: 0093381-01**										
Prepared: 9/29/2020 19:33, Analyzed: 9/29/2020 19:33										
Chloride	1210	11.1	mg/L	1110	20.7	107	75-125			D
Fluoride	1300	22.2	mg/L	1110	ND	117	75-125			D
Sulfate	2500	111	mg/L	1110	2790	NR	75-125			D, M2
Matrix Spike Dup (B040214-MSD1) **Source: 0093381-01**										
Prepared: 9/29/2020 19:48, Analyzed: 9/29/2020 19:48										
Chloride	1070	11.1	mg/L	1110	20.7	94.5	75-125	12.2	15	D
Fluoride	1150	22.2	mg/L	1110	ND	104	75-125	11.8	15	
Sulfate	2440	111	mg/L	1110	2790	NR	75-125	2.45	15	M2
Batch B040230 - Default Prep IC										
Blank (B040230-BLK1)										
Prepared: 9/29/2020 20:35, Analyzed: 9/29/2020 20:35										
Chloride	ND	2.0	mg/L							U
LCS (B040230-BS1)										
Prepared: 9/29/2020 20:19, Analyzed: 9/29/2020 20:19										
Chloride	9.9		mg/L	10.0		99.2	90-110			

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040230 - Default Prep IC										
Matrix Spike (B040230-MS1) **Source: 0084068-08**										
Prepared: 9/29/2020 21:06, Analyzed: 9/29/2020 21:06										
Chloride	11.7	0.1	mg/L	11.1	ND	106	75-125			
Matrix Spike Dup (B040230-MSD1) **Source: 0084068-08**										
Prepared: 9/29/2020 21:21, Analyzed: 9/29/2020 21:21										
Chloride	10.7	0.1	mg/L	11.1	ND	95.9	75-125	9.62	15	
Batch B040288 - Default Prep IC										
Blank (B040288-BLK1)										
Prepared: 9/30/2020 13:26, Analyzed: 9/30/2020 13:26										
Sulfate	ND	1	mg/L							U
LCS (B040288-BS1)										
Prepared: 9/30/2020 13:11, Analyzed: 9/30/2020 13:11										
Sulfate	10		mg/L	10.0		100	90-110			
Matrix Spike (B040288-MS1) **Source: 0093556-01**										
Prepared: 9/30/2020 14:59, Analyzed: 9/30/2020 14:59										
Sulfate	55		mg/L	10.0	46	84.6	75-125			
Matrix Spike Dup (B040288-MSD1) **Source: 0093556-01**										
Prepared: 9/30/2020 15:14, Analyzed: 9/30/2020 15:14										
Sulfate	55		mg/L	10.0	46	88.2	75-125	0.657	15	
Batch B040297 - Default Prep IC										
Blank (B040297-BLK1)										
Prepared: 9/30/2020 16:16, Analyzed: 9/30/2020 16:16										
Fluoride	ND	0.2	mg/L							U
Chloride	ND	2.0	mg/L							U
Sulfate	ND	1	mg/L							U

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040297 - Default Prep IC										
LCS (B040297-BS1)										
Prepared: 9/30/2020 16:00, Analyzed: 9/30/2020 16:00										
Fluoride	9.6		mg/L	10.0		95.8	90-110			
Chloride	9.9		mg/L	10.0		99.2	90-110			
Sulfate	10		mg/L	10.0		98.2	90-110			
Matrix Spike (B040297-MS1) **Source: 0084068-08**										
Prepared: 9/30/2020 17:49, Analyzed: 9/30/2020 17:49										
Fluoride	11.0		mg/L	10.0	0.0	110	75-125			
Chloride	11.5		mg/L	10.0	0.06	114	75-125			
Sulfate	11		mg/L	10.0	0	115	75-125			
Matrix Spike Dup (B040297-MSD1) **Source: 0084068-08**										
Prepared: 9/30/2020 18:04, Analyzed: 9/30/2020 18:04										
Fluoride	13.6		mg/L	10.0	0.0	136	75-125	21.3	15	M1, Y2
Chloride	14.0		mg/L	10.0	0.06	139	75-125	19.5	15	M1, Y2
Sulfate	14		mg/L	10.0	0	141	75-125	20.5	15	M1, Y2
Batch B040401 - Default Prep IC										
Blank (B040401-BLK1)										
Prepared: 10/1/2020 14:07, Analyzed: 10/1/2020 14:07										
Chloride	ND	2.0	mg/L							U
LCS (B040401-BS1)										
Prepared: 10/1/2020 13:52, Analyzed: 10/1/2020 13:52										
Chloride	9.6		mg/L	10.0		96.5	90-110			
Matrix Spike (B040401-MS1) **Source: 0093548-02**										
Prepared: 10/1/2020 14:38, Analyzed: 10/1/2020 14:38										
Chloride	31.6		mg/L	10.0	20.9	106	75-125			
Matrix Spike Dup (B040401-MSD1) **Source: 0093548-02**										
Prepared: 10/1/2020 14:53, Analyzed: 10/1/2020 14:53										
Chloride	33.2		mg/L	10.0	20.9	123	75-125	5.02	15	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B043119 - Default Prep IC										
Blank (B043119-BLK1)										
Prepared: 10/20/2020 9:36, Analyzed: 10/20/2020 9:36										
Chloride	ND	2.0	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B043119-BS1)										
Prepared: 10/20/2020 9:21, Analyzed: 10/20/2020 9:21										
Chloride	10.1		mg/L	10.0		101	90-110			
Sulfate	10		mg/L	10.0		102	90-110			
Matrix Spike (B043119-MS1) **Source: 0103247-07**										
Prepared: 10/20/2020 16:33, Analyzed: 10/20/2020 16:33										
Chloride	15.9		mg/L	10.0	3.6	123	75-125			
Sulfate	77		mg/L	10.0	69	78.6	75-125			
Matrix Spike Dup (B043119-MSD1) **Source: 0103247-07**										
Prepared: 10/20/2020 16:48, Analyzed: 10/20/2020 16:48										
Chloride	16.9		mg/L	10.0	3.6	133	75-125	6.23	15	M1
Sulfate	77		mg/L	10.0	69	78.9	75-125	0.0417	15	
Batch B043432 - Default Prep IC										
Blank (B043432-BLK1)										
Prepared: 10/22/2020 11:48, Analyzed: 10/22/2020 11:48										
Sulfate	ND	1	mg/L							U
LCS (B043432-BS1)										
Prepared: 10/22/2020 11:33, Analyzed: 10/22/2020 11:33										
Sulfate	10		mg/L	10.0		97.2	90-110			
Matrix Spike (B043432-MS1) **Source: 0103754-01**										
Prepared: 10/22/2020 15:54, Analyzed: 10/22/2020 15:54										
Sulfate	74		mg/L	10.0	66	80.7	75-125			
Matrix Spike Dup (B043432-MSD1) **Source: 0103754-01**										
Prepared: 10/22/2020 16:10, Analyzed: 10/22/2020 16:10										
Sulfate	74		mg/L	10.0	66	76.9	75-125	0.521	15	

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Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B043441 - Default Prep IC										
Blank (B043441-BLK1)										
Prepared: 10/22/2020 16:41, Analyzed: 10/22/2020 16:41										
Sulfate	ND	1	mg/L							U
LCS (B043441-BS1)										
Prepared: 10/22/2020 16:25, Analyzed: 10/22/2020 16:25										
Sulfate	10		mg/L	10.0		95.5	90-110			
Matrix Spike (B043441-MS1) **Source: 0103886-01**										
Prepared: 10/22/2020 19:46, Analyzed: 10/22/2020 19:46										
Sulfate	25		mg/L	10.0	14	116	75-125			
Matrix Spike Dup (B043441-MSD1) **Source: 0103886-01**										
Prepared: 10/22/2020 20:02, Analyzed: 10/22/2020 20:02										
Sulfate	23		mg/L	10.0	14	97.0	75-125	7.62	15	

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030)
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
SW846 6010 B in Water	

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Sample Acceptance Checklist for Work Order 0084068

Shipped By: Client

Temperature: 2.60° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-01 A	9/22/20	1009	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 : ✓				
0084068-01 B	9/22/20	1009	Plastic 1L	1	MW1	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0084068-01 C	9/22/20	1009	Plastic 500mL pH<2 w/H2SO4	1	MW1	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-01 D	9/22/20	1009	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW1	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: ACL NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1009

pH 6.88 Cond ~~umhos~~ mS/cm 0.661 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 17.50 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		9/23/20	1245

☐ PACE- Check here if trip charge applied to associated COC

2.6

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC Kentucky
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Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-01 E	9/22/20	1009	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-01 F	9/22/20	1009	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW1	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-01 G	9/22/20	1009	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW1	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-01 H	9/22/20	1009	AG 250mL pH<2 w/H2SO4	1	MW1	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: Ael NOV

Field data collected by: Philip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1009

pH 6.88 Cond ~~umho~~ mS/cm 0.661 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.50 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	Abby Lamp	9/23/20	1245

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Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-02 A	9/22/20	1555	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 : ✓				
0084068-02 B	9/22/20	1555	Plastic 1L	1	MW2	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0084068-02 C	9/22/20	1555	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-02 D	9/22/20	1555	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW2	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-02 E	9/22/20	1555	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AEL NOV

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1555

pH 6.22 Cond ~~(umho)~~ mS/cm 1.25 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.57 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)
[signature]	[signature]	9/23/20	1245

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-02 F	9/22/20	1555	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW2	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-02 G	9/22/20	1555	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW2	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-02 H	9/22/20	1555	AG 250mL pH<2 w/H2SO4	1	MW2	g / c	TOC
			Preservation Check: pH : ✓				
0084068-03 A	9/22/20	1447	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 : ✓				
0084068-03 B	9/22/20	1447	Plastic 1L	1	MW3A	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: Ael MDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1555 MW2

pH 6.22 Cond mS/cm (~~umho~~) 1.25 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.57 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)
	Amy Lacie	9/23/20	1245

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
Quote#

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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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-03 C	9/22/20	1447	Plastic 500mL pH<2 w/H2SO4	1	MW3A	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-03 D	9/22/20	1447	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3A	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-03 E	9/22/20	1447	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-03 F	9/22/20	1447	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW3A	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-03 G	9/22/20	1447	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW3A	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-03 H	9/22/20	1447	AG 250mL pH<2 w/H2SO4	1	MW3A	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: ALL NOV

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1447

pH 6.61 Cond ~~(umho)~~ mS/cm 6.07 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.77 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)
	Amy Lamb	9/23/20	1245

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
Quote#

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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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-04 A	9/22/20	1348	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 : ✓				
0084068-04 B	9/22/20	1348	Plastic 1L	1	MW4	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0084068-04 C	9/22/20	1348	Plastic 500mL pH<2 w/H2SO4	1	MW4	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-04 D	9/22/20	1348	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-04 E	9/22/20	1348	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: All NDG

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1348

pH 6.64 Cond ~~(umho)~~ mS/cm 4.82 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.43 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)
		9/23/20	1245

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
Quote#

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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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-04 F	9/22/20	1348	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW4	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-04 G	9/22/20	1348	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW4	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-04 H	9/22/20	1348	AG 250mL pH<2 w/H2SO4	1	MW4	g / c	TOC
			Preservation Check: pH : ✓				
0084068-05 A	9/22/20	1248	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 : ✓				
0084068-05 B	9/22/20	1248	Plastic 1L	1	MW5	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: Kel NOV

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1348 MW4

pH 6.64 Cond ~~(umho)~~ mS/cm 4.82 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.43 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)
	amy Lam	9/23/20	1245

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Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC-Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-05 C	9/22/20	1248	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-05 D	9/22/20	1248	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-05 E	9/22/20	1248	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-05 F	9/22/20	1248	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW5	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-05 G	9/22/20	1248	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW5	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-05 H	9/22/20	1248	AG 250mL pH<2 w/H2SO4	1	MW5	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: ALL NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1248

pH 6.52 Cond ~~umho~~ mS/cm 4.48 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 17.61 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)
	Amy Lawson	9/23/20	1245

☐ PACE- Check here if trip charge applied to associated COC

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-06 A	9/22/20	1135	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 : ✓				
0084068-06 B	9/22/20	1135	Plastic 1L	1	MW6	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0084068-06 C	9/22/20	1135	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-06 D	9/22/20	1135	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-06 E	9/22/20	1135	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: ALL NDY

Field data collected by: Phillip HH Date (mm/dd/yy) 9/22/20 Time (24 hr) 1135

pH 6.32 Cond ~~(umho)~~ mS/cm 3.74 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 18.70 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	Abby Lewis	9/23/20	1245

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-06 F	9/22/20	1135	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW6	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-06 G	9/22/20	1135	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW6	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-06 H	9/22/20	1135	AG 250mL pH<2 w/H2SO4	1	MW6	g / c	TOC
			Preservation Check: pH : ✓				
0084068-07 A	9/22/20	1150	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 : ✓				
0084068-07 B	9/22/20	1150	Plastic 1L	1	DUPLICATE	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

Preservation Check Performed by: ANI NDH

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1135 MW6

pH 6.32 Cond ~~(umho)~~ mS/cm 3.74 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 18.70 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	Abby Lauk	9/23/20	1245

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P.O. Box 907
Madisonville, KY 42431

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Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-07 C	9/22/20	1150	Plastic 500mL pH<2 w/H2SO4	1	DUPLICATE	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-07 D	9/22/20	1150	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-07 E	9/22/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-07 F	9/22/20	1150	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-07 G	9/22/20	1150	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-07 H	9/22/20	1150	AG 250mL pH<2 w/H2SO4	1	DUPLICATE	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: Acl NDY

Field data collected by: Phillip Hsu Date (mm/dd/yy) 9/22/20 Time (24 hr) 1150

pH 6.32 Cond ~~(umho)~~ mS/cm 3.74 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 18.70 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
	Abbey Lewis	9/22/20	1245

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-08 A	9/22/20	1615	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 : ✓				
0084068-08 B	9/22/20	1615	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056
0084068-08 C	9/22/20	1615	Plastic 500mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-08 D	9/22/20	1615	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-08 E	9/22/20	1615	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: Ael Moy

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1615

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]	abby Lauri	9/23/20	1245

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
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Chad Phillips
PO Box 24
Henderson, KY 42419

Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419

PO#: 261131
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 # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-08 F	9/22/20	1615	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-08 G	9/22/20	1615	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-08 H	9/22/20	1615	AG 250mL pH<2 w/H2SO4	1	FIELD BLANK	g / c	TOC
			Preservation Check: pH : ✓				

Preservation Check Performed by: Ael NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/22/20 Time (24 hr) 1615

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)
	Abby Lowe	9/23/20	1245

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

October 15, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on September 25, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30384344001	**0084068-01**	Water	09/22/20 10:09	09/25/20 10:30
30384344002	**0084068-02**	Water	09/22/20 15:55	09/25/20 10:30
30384344003	**0084068-03**	Water	09/22/20 14:47	09/25/20 10:30
30384344004	**0084068-04**	Water	09/22/20 13:48	09/25/20 10:30
30384344005	**0084068-05**	Water	09/22/20 12:48	09/25/20 10:30
30384344006	**0084068-06**	Water	09/22/20 11:35	09/25/20 10:30
30384344007	**0084068-07**	Water	09/22/20 11:50	09/25/20 10:30
30384344008	**0084068-08**	Water	09/22/20 16:15	09/25/20 10:30

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30384344001	**0084068-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344002	**0084068-02**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344003	**0084068-03**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344004	**0084068-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344005	**0084068-05**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344006	**0084068-06**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344007	**0084068-07**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384344008	**0084068-08**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Sample: 0084068-01 **Lab ID: 30384344001** Collected: 09/22/20 10:09 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.0590 ± 0.269 (0.434) C:NA T:94%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.505 ± 0.501 (1.04) C:71% T:74%**	pCi/L	10/13/20 14:15	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.564 ± 0.770 (1.47)**	pCi/L	10/15/20 13:41	7440-14-4	

Sample: 0084068-02 **Lab ID: 30384344002** Collected: 09/22/20 15:55 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.208 ± 0.409 (0.748) C:NA T:80%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.285 ± 0.417 (0.898) C:72% T:87%**	pCi/L	10/13/20 14:15	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.493 ± 0.826 (1.65)**	pCi/L	10/15/20 13:41	7440-14-4	

Sample: 0084068-03 **Lab ID: 30384344003** Collected: 09/22/20 14:47 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.640 ± 0.441 (0.471) C:NA T:82%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.869 ± 0.504 (0.935) C:70% T:84%**	pCi/L	10/13/20 14:15	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.51 ± 0.945 (1.41)**	pCi/L	10/15/20 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Sample: 0084068-04 **Lab ID: 30384344004** Collected: 09/22/20 13:48 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.111 ± 0.461 (0.879) C:NA T:92%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.766 ± 0.501 (0.952) C:71% T:80%**	pCi/L	10/13/20 14:15	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.877 ± 0.962 (1.83)**	pCi/L	10/15/20 13:41	7440-14-4	

Sample: 0084068-05 **Lab ID: 30384344005** Collected: 09/22/20 12:48 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.109 ± 0.262 (0.506) C:NA T:96%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.57 ± 0.580 (0.871) C:71% T:85%**	pCi/L	10/13/20 14:15	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.68 ± 0.842 (1.38)**	pCi/L	10/15/20 13:41	7440-14-4	

Sample: 0084068-06 **Lab ID: 30384344006** Collected: 09/22/20 11:35 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.382 ± 0.469 (1.11) C:NA T:87%**	pCi/L	10/13/20 12:32	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.380 ± 0.409 (0.854) C:73% T:89%**	pCi/L	10/13/20 14:16	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.380 ± 0.878 (1.96)**	pCi/L	10/15/20 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

Sample: 0084068-07 **Lab ID: 30384344007** Collected: 09/22/20 11:50 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.119 ± 0.368 (0.835) C:NA T:88%**	pCi/L	10/13/20 12:46	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.510 ± 0.462 (0.948) C:74% T:84%**	pCi/L	10/13/20 14:16	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.510 ± 0.830 (1.78)**	pCi/L	10/15/20 13:41	7440-14-4	

Sample: 0084068-08 **Lab ID: 30384344008** Collected: 09/22/20 16:15 Received: 09/25/20 10:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.189 ± 0.288 (0.756) C:NA T:89%**	pCi/L	10/13/20 12:46	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.429 ± 0.519 (1.10) C:74% T:74%**	pCi/L	10/13/20 14:16	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.429 ± 0.807 (1.86)**	pCi/L	10/15/20 13:41	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

QC Batch: 416307 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: 30384344001, 30384344002, 30384344003, 30384344004, 30384344005, 30384344006, 30384344007, 30384344008

METHOD BLANK: 2012824 Matrix: Water
Associated Lab Samples: 30384344001, 30384344002, 30384344003, 30384344004, 30384344005, 30384344006, 30384344007, 30384344008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.140 ± 0.303 (0.560) C:NA T:85%	pCi/L	10/13/20 12:32	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

QC Batch: 416308 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: 30384344001, 30384344002, 30384344003, 30384344004, 30384344005, 30384344006, 30384344007, 30384344008

METHOD BLANK: 2012825 Matrix: Water
Associated Lab Samples: 30384344001, 30384344002, 30384344003, 30384344004, 30384344005, 30384344006, 30384344007, 30384344008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0535 ± 0.417 (0.958) C:72% T:69%	pCi/L	10/13/20 14:13	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 84068 Big Rivers Electric Corp
Pace Project No.: 30384344

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.

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.

WO# : 30384344

30384344

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 84068 Workorder Name: Green Landfill Semiannual Owner Received Date: 9/23/2020 Results Requested By:

Report To:	Subcontract To:
McCoy & McCoy Labs P.O. Box 907 Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1					Ground								
2	0084068-01		09/22/20 10:09	IR44-McCoy	Water						X	X	001
3	0084068-02		09/22/20 15:55	IR44-McCoy	Water						X	X	002
4	0084068-03		09/22/20 14:47	IR44-McCoy	Water						X	X	003
5	0084068-04		09/22/20 13:48	IR44-McCoy	Water						X	X	004
6	0084068-05		09/22/20 12:48	IR44-McCoy	Water						X	X	005
7	0084068-06		09/22/20 11:35	IR44-McCoy	Water						X	X	006
8	0084068-07		09/22/20 11:50	IR44-McCoy	Water						X	X	007
9	0084068-08		09/22/20 16:15	IR44-McCoy	Water						X	X	008
10													

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			Nicole Rund	9/25/2020 1030	
2					
3					

Cooler Temperature on Receipt 6.0 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

30384344

Pace Analytical Services, LLC Kentucky

0084068

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: 0084068-01	**Water**	**Sampled:09/22/2020 10:09**	**Specific Method**	
Radium 228 (sub)		03/21/2021 10:09	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 10:09	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/21/2021 10:09	EPA 903.1	
Sample ID: 0084068-02	**Water**	**Sampled:09/22/2020 15:55**	**Specific Method**	
Radium 226 (sub)		03/21/2021 15:55	EPA 903.1	
Radium 228 (sub)		03/21/2021 15:55	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 15:55	EPA 904.0 Radium Sum C	
Sample ID: 0084068-03	**Water**	**Sampled:09/22/2020 14:47**	**Specific Method**	
Radium 226 (sub)		03/21/2021 14:47	EPA 903.1	
Radium 228 (sub)		03/21/2021 14:47	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 14:47	EPA 904.0 Radium Sum C	
Sample ID: 0084068-04	**Water**	**Sampled:09/22/2020 13:48**	**Specific Method**	
Radium Total (sub)		03/21/2021 13:48	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/21/2021 13:48	EPA 903.1	
Radium 228 (sub)		03/21/2021 13:48	EPA 904.0 Radium Sum C	
Sample ID: 0084068-05	**Water**	**Sampled:09/22/2020 12:48**	**Specific Method**	
Radium 228 (sub)		03/21/2021 12:48	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 12:48	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/21/2021 12:48	EPA 903.1	

Released By	Date	Received By	Date
[signature]	09.24.20		
Released By	Date	Received By	Date

SUBCONTRACT ORDER

30384344 Pace Analytical Services, LLC Kentucky

0084068

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0084068-06	**Water**	**Sampled:09/22/2020 11:35**	**Specific Method**	
Radium 226 (sub)		03/21/2021 11:35	EPA 903.1	
Radium 228 (sub)		03/21/2021 11:35	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 11:35	EPA 904.0 Radium Sum C	
Sample ID: 0084068-07	**Water**	**Sampled:09/22/2020 11:50**	**Specific Method**	
Radium 226 (sub)		03/21/2021 11:50	EPA 903.1	
Radium 228 (sub)		03/21/2021 11:50	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/21/2021 11:50	EPA 904.0 Radium Sum C	
Sample ID: 0084068-08	**Water**	**Sampled:09/22/2020 16:15**	**Specific Method**	
Radium Total (sub)		03/21/2021 16:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/21/2021 16:15	EPA 903.1	
Radium 228 (sub)		03/21/2021 16:15	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KY Project # 30384344

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label NMR
LIMS Login NMR

Tracking #: 110733867772

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 6.4 °C Correction Factor: -0.4 °C Final Temp: 6.0 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D0401 / Date and Initials of person examining contents: NMR 9/25/2020
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date & time on samples
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16.
All containers meet method preservation requirements. NMR 9/25/2020	X	✓		Initial when completed NMR Date/time of preservation 9/25/2020 1915 Lot # of added preservative DL20-1044
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 9/25/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Certificate of Analysis
0101831

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 10/26/2020 10:39

Project Name:	Green Landfill Semiannual Groundwater	Workorder:	0101831

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 10/01/2020 15:31.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0101831-01	MW-104/	Groundwater	10/01/2020 09:25	10/01/2020 15:31	Phillip Hill

LabNumber	Measurement	Value
0101831-01	Field Conductance	6710
	Field pH	6.91
	Field Temp (C)	14.48

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ANALYTICAL RESULTS

Lab Sample ID: **0101831-01**
Description: **MW-104**

Sample Collection Date Time: 10/01/2020 09:25
Sample Received Date Time: 10/01/2020 15:31

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Arsenic	**0.0013**		mg/L	0.0010	0.0004	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Barium	**0.018**		mg/L	0.004	0.001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Beryllium	ND	U, D2	mg/L	0.0020	0.0010	SW846-6020 A	10/02/2020 10:55	10/23/2020 14:42	CAM
Boron	**0.23**	D2	mg/L	0.10	0.10	SW846 6010 B	10/02/2020 10:55	10/23/2020 14:27	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Calcium	**491**	D1	mg/L	40.0	13.0	SW846 6010 B	10/02/2020 10:55	10/02/2020 16:56	dmh
Chromium	**0.0013**	J	mg/L	0.0020	0.0006	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Cobalt	**0.005**		mg/L	0.004	0.004	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Copper	ND	U	mg/L	0.003	0.001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Iron	**1.09**	D2	mg/L	1.00	0.500	SW846 6010 B	10/02/2020 10:55	10/02/2020 16:53	dmh
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Lithium	**0.02**	D2	mg/L	0.02	0.005	SW846-6020 A	10/02/2020 10:55	10/23/2020 14:42	CAM
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH
Molybdenum	ND	U, D2	mg/L	0.01	0.002	SW846-6020 A	10/02/2020 10:55	10/23/2020 14:42	CAM
Selenium	ND	U, D2	mg/L	0.003	0.001	SW846-6020 A	10/02/2020 10:55	10/23/2020 14:42	CAM
Sodium	**832**	D1	mg/L	26.0	10.0	SW846 6010 B	10/02/2020 10:55	10/02/2020 16:56	dmh
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:54	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chemical Oxygen Demand	**75**		mg/L	5	5	HACH 8000	10/12/2020 17:11	10/12/2020 17:11	HMF
Specific Conductance (Lab)	**8270**		umhos/cm	1	1	2510 B-2011	10/08/2020 13:37	10/08/2020 13:37	GAT
pH (Lab)	**6.77**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	10/05/2020 15:08	10/05/2020 15:08	GAT
Total Dissolved Solids	**6270**		mg/L	50	50	2540 C-2011	10/06/2020 11:50	10/07/2020 13:45	MAG
Total Organic Carbon	**1.1**		mg/L	0.5		5310 C-2011	10/11/2020 05:53	10/11/2020 05:53	HMF

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	0.00	_Sub	pCi/L			EPA 903.1	10/21/2020 00:00	10/21/2020 00:00	xxx
Radium-228	**0.422**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/21/2020 00:00	10/21/2020 00:00	xxx
Radium	**0.422**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/21/2020 00:00	10/21/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**2220**	D	mg/L	200	128	SW846 9056	10/02/2020 23:19	10/02/2020 23:19	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	10/02/2020 23:03	10/02/2020 23:03	CSC
Sulfate	**2730**	D	mg/L	200	100	SW846 9056	10/05/2020 13:15	10/05/2020 13:15	CSC

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Notes for work order 0101831

- 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.
H1	Sample analysis performed past holding time.
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
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.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Results relate only to the items tested.

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Blank (B040473-BLK1)										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 16:31										
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
Copper	0.001	0.003	mg/L							J
Blank (B040473-BLK2)										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:21										
Molybdenum	ND	0.01	mg/L							U
Mercury	ND	0.0005	mg/L							U
Antimony	ND	0.005	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
Copper	0.001	0.003	mg/L							J
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 (B040473-BS1)										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 16:34										
Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.68	0.40	mg/L	6.25		107	85-115			
Iron	6.47	0.100	mg/L	6.25		104	85-115			
Sodium	6.55	0.26	mg/L	6.25		105	85-115			
Copper	0.069	0.003	mg/L	0.0625		110	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
LCS (B040473-BS2)										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:25										
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Antimony	0.071	0.005	mg/L	0.0625		113	85-115			
Arsenic	0.0666	0.0010	mg/L	0.0625		107	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0654	0.0020	mg/L	0.0625		105	85-115			
Cadmium	0.0659	0.0010	mg/L	0.0625		105	85-115			
Chromium	0.0671	0.0020	mg/L	0.0625		107	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Copper	0.069	0.003	mg/L	0.0625		110	85-115			
Lead	0.067	0.002	mg/L	0.0625		107	85-115			
Lithium	0.07	0.02	mg/L	0.0625		105	85-115			
Selenium	0.066	0.003	mg/L	0.0625		106	85-115			
Thallium	0.0679	0.0020	mg/L	0.0625		109	85-115			
Matrix Spike (B040473-MS1) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:34										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	165	40.0	mg/L	6.25	162	49.3	80-120			D2, M2
Iron	9.86	10.0	mg/L	6.25	ND	158	80-120			D2, M1, J
Sodium	105	26.0	mg/L	6.25	93.0	194	80-120			D2, M1
Copper	ND	0.300	mg/L	0.0625	ND		80-120			D2, M4, U
Matrix Spike (B040473-MS2) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:43										
Molybdenum	ND	1.00	mg/L	0.0625	ND		80-120			D2, M4, U
Mercury	ND	0.0500	mg/L	0.00250	ND		80-120			D2, M4, U
Antimony	ND	0.500	mg/L	0.0625	ND		80-120			D2, M4, U
Arsenic	0.0676	0.100	mg/L	0.0625	ND	108	80-120			D2, J
Barium	0.122	0.400	mg/L	0.0625	ND	195	80-120			D2, M1, J
Beryllium	ND	0.200	mg/L	0.0625	ND		80-120			D2, M4, U
Cadmium	0.0615	0.100	mg/L	0.0625	ND	98.4	80-120			D2, J
Chromium	0.0704	0.200	mg/L	0.0625	ND	113	80-120			D2, J
Cobalt	ND	0.400	mg/L	0.0625	ND		80-120			D2, M4, U
Copper	ND	0.300	mg/L	0.0625	ND		80-120			D2, M4, U
Lead	0.062	0.200	mg/L	0.0625	ND	99.5	80-120			D2, J
Lithium	ND	2.00	mg/L	0.0625	ND		80-120			D2, M4, U
Selenium	ND	0.300	mg/L	0.0625	ND		80-120			D2, M4, U
Thallium	0.0617	0.200	mg/L	0.0625	ND	98.7	80-120			D2, J

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Matrix Spike Dup (B040473-MSD1)	**Source: 0101830-01**									
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:37										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	159	40.0	mg/L	6.25	162	NR	80-120	3.66	20	D2, M2
Iron	9.48	10.0	mg/L	6.25	ND	152	80-120	3.96	20	D2, M1, J
Sodium	102	26.0	mg/L	6.25	93.0	138	80-120	3.38	20	D2, M1
Copper	ND	0.300	mg/L	0.0625	ND		80-120		20	D2, M4, U
Matrix Spike Dup (B040473-MSD2)	**Source: 0101830-01**									
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 14:29										
Antimony	ND	0.500	mg/L	0.0625	ND		80-120		20	D2, M4, U
Molybdenum	ND	1.00	mg/L	0.0625	ND		80-120		20	D2, M4, U
Mercury	ND	0.0500	mg/L	0.00250	ND		80-120		20	D2, M4, U
Arsenic	0.0667	0.100	mg/L	0.0625	ND	107	80-120	1.42	20	D2, J
Barium	0.126	0.400	mg/L	0.0625	ND	201	80-120	3.10	20	D2, M1, J
Beryllium	ND	0.200	mg/L	0.0625	ND		80-120		20	D2, M4, U
Cadmium	0.0644	0.100	mg/L	0.0625	ND	103	80-120	4.66	20	D2, J
Chromium	0.0678	0.200	mg/L	0.0625	ND	108	80-120	3.83	20	D2, J
Cobalt	ND	0.400	mg/L	0.0625	ND		80-120		20	D2, M4, U
Copper	ND	0.300	mg/L	0.0625	ND		80-120		20	D2, M4, U
Lead	0.064	0.200	mg/L	0.0625	ND	103	80-120	3.34	20	D2, J
Lithium	ND	2.00	mg/L	0.0625	ND		80-120		20	D2, M4, U
Selenium	ND	0.300	mg/L	0.0625	ND		80-120		20	D2, M4, U
Thallium	0.0640	0.200	mg/L	0.0625	ND	102	80-120	3.66	20	D2, J
Post Spike (B040473-PS1)	**Source: 0101830-01**									
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:41										
Boron	687		ug/L	125	534	123	75-125			D2, M1
Calcium	169000		ug/L	6250	162000	106	75-125			D2
Iron	11400		ug/L	6250	3280	129	75-125			D2, M1
Sodium	107000		ug/L	6250	93000	227	75-125			D2, M1
Copper	79.4		ug/L	62.5	-1.75	127	75-125			D2, M4

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Post Spike (B040473-PS2) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 15:01										
Antimony	65.1		ug/L	62.5	0.102	104	75-125			D2
Mercury	5.11		ug/L	2.50	0.0349	203	75-125			D2, M1
Molybdenum	63.6		ug/L	62.5	0.32	101	75-125			D2
Arsenic	65.1		ug/L	62.5	0.369	104	75-125			D2
Barium	125		ug/L	62.5	55.6	110	75-125			D2
Beryllium	64.9		ug/L	62.5	0.153	104	75-125			D2, J5
Cadmium	60.0		ug/L	62.5	0.0093	96.0	75-125			D2
Chromium	69.9		ug/L	62.5	1.64	109	75-125			D2
Cobalt	64.6		ug/L	62.5	0.462	103	75-125			
Copper	79.4		ug/L	62.5	-1.75	127	75-125			D2, M1
Lead	60.3		ug/L	62.5	0.827	95.2	75-115			D2
Lithium	87.2		ug/L	62.5	16.4	113	75-125			D2, J5
Selenium	66.7		ug/L	62.5	0.032	107	75-125			D2
Thallium	58.7		ug/L	62.5	0.0056	94.0	75-125			D2

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B041075 - Default Prep Wet Chem										
LCS (B041075-BS1)										
Prepared: 10/5/2020 14:58, Analyzed: 10/5/2020 14:58										
pH (Lab)	8.01		Std. Units	8.00		100	98.8-101.2			
LCS (B041075-BS2)										
Prepared: 10/5/2020 15:14, Analyzed: 10/5/2020 15:14										
pH (Lab)	8.01		Std. Units	8.00		100	98.8-101.2			
Duplicate (B041075-DUP1) **Source: 0101962-02**										
Prepared: 10/5/2020 15:12, Analyzed: 10/5/2020 15:12										
pH (Lab)	9.09	0.10	Std. Units		9.09			0.00	10	
Duplicate (B041075-DUP2) **Source: 0101962-04**										
Prepared: 10/5/2020 15:17, Analyzed: 10/5/2020 15:17										
pH (Lab)	7.20	0.10	Std. Units		7.20			0.00	10	
Batch B041144 - Default Prep Wet Chem										
Blank (B041144-BLK1)										
Prepared: 10/6/2020 11:14, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B041144-BS1)										
Prepared: 10/6/2020 11:18, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	1400	25	mg/L	1500		93.0	80-120			
Duplicate (B041144-DUP1) **Source: 0050661-03**										
Prepared: 10/6/2020 11:54, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	224	50	mg/L		210			6.45	10	
Batch B041401 - Default Prep Wet Chem										
Blank (B041401-BLK1)										
Prepared: 10/8/2020 13:29, Analyzed: 10/8/2020 13:29										
Specific Conductance (Lab)	ND	1	umhos/cm							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B041401 - Default Prep Wet Chem										
LCS (B041401-BS1)										
Prepared: 10/8/2020 13:30, Analyzed: 10/8/2020 13:30										
Specific Conductance (Lab)	1390		umhos/cm	1410		98.4	80-120			
Duplicate (B041401-DUP1)	**Source: 0102576-04**									
Prepared: 10/8/2020 13:42, Analyzed: 10/8/2020 13:42										
Specific Conductance (Lab)	5000	1	umhos/cm		5010			0.200	1.24	
Batch B041412 - Default Prep Wet Chem										
Blank (B041412-BLK1)										
Prepared: 10/10/2020 23:11, Analyzed: 10/10/2020 23:11										
Total Organic Carbon	ND	0.5	mg/L							U
LCS (B041412-BS1)										
Prepared: 10/10/2020 23:32, Analyzed: 10/10/2020 23:32										
Total Organic Carbon	5.0	0.5	mg/L	5.00		99.1	80-120			
Duplicate (B041412-DUP1)	**Source: 0101522-01**									
Prepared: 10/11/2020 4:49, Analyzed: 10/11/2020 4:49										
Total Organic Carbon	4.2	0.5	mg/L		4.3			0.741	25	
Duplicate (B041412-DUP2)	**Source: 0102312-01**									
Prepared: 10/11/2020 9:46, Analyzed: 10/11/2020 9:46										
Total Organic Carbon	1.6	0.5	mg/L		1.6			1.03	25	
Matrix Spike (B041412-MS1)	**Source: 0101522-02**									
Prepared: 10/11/2020 5:10, Analyzed: 10/11/2020 5:10										
Total Organic Carbon	4.8	0.5	mg/L	2.50	2.4	99.9	80-120			
Matrix Spike (B041412-MS2)	**Source: 0102312-02**									
Prepared: 10/11/2020 10:07, Analyzed: 10/11/2020 10:07										
Total Organic Carbon	6.2	0.5	mg/L	5.00	1.4	96.6	80-120			
Batch B042081 - Default Prep Wet Chem										
Blank (B042081-BLK1)										
Prepared: 10/12/2020 16:20, Analyzed: 10/12/2020 16:20										
Chemical Oxygen Demand	ND	5	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B042081 - Default Prep Wet Chem										
LCS (B042081-BS1)										
Prepared: 10/12/2020 16:20, Analyzed: 10/12/2020 16:20										
Chemical Oxygen Demand	117	5	mg/L	125		93.9	90-110			
Duplicate (B042081-DUP1) **Source: 0100758-01**										
Prepared: 10/12/2020 17:11, Analyzed: 10/12/2020 17:11										
Chemical Oxygen Demand	91	5	mg/L		88			3.64	25	
Matrix Spike (B042081-MS1) **Source: 0100758-01**										
Prepared: 10/12/2020 17:11, Analyzed: 10/12/2020 17:11										
Chemical Oxygen Demand	314	5	mg/L	250	88	90.5	90-110			
Matrix Spike Dup (B042081-MSD1) **Source: 0100758-01**										
Prepared: 10/12/2020 17:12, Analyzed: 10/12/2020 17:12										
Chemical Oxygen Demand	309	5	mg/L	250	88	88.5	90-110	1.62	10	M2

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040540 - Default Prep IC										
Blank (B040540-BLK1)										
Prepared: 10/2/2020 19:28, Analyzed: 10/2/2020 19:28										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B040540-BS1)										
Prepared: 10/2/2020 19:12, Analyzed: 10/2/2020 19:12										
Fluoride	9.6		mg/L	10.0		96.1	90-110			
Chloride	9.8		mg/L	10.0		98.2	90-110			
Sulfate	10		mg/L	10.0		95.0	90-110			
Matrix Spike (B040540-MS1) **Source: 0101801-01**										
Prepared: 10/2/2020 23:50, Analyzed: 10/2/2020 23:50										
Fluoride	13.9		mg/L	10.0	0.2	137	75-125			M1
Chloride	22.1		mg/L	10.0	9.1	130	75-125			M1
Sulfate	14		mg/L	10.0	0.05	139	75-125			M1
Matrix Spike Dup (B040540-MSD1) **Source: 0101801-01**										
Prepared: 10/3/2020 0:05, Analyzed: 10/3/2020 0:05										
Fluoride	12.4		mg/L	10.0	0.2	123	75-125	10.7	15	
Chloride	21.0		mg/L	10.0	9.1	119	75-125	5.29	15	
Sulfate	12		mg/L	10.0	0.05	124	75-125	11.2	15	

Certified Analyses included in this Report

Analyte	Certifications
2510 B-2011 in Water	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
5310 C-2011 in Water	
Total Organic Carbon	KY Drinking Water Mdv (00030)
HACH 8000 in Water	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
SW846 6010 B in Water	

Pace Analytical Services, LLC
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Sample Acceptance Checklist for Work Order 0101831

Shipped By: Client

Temperature: 2.10° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation
Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-09 A	10/1/20	925	Plastic 500mL pH<2 w/HNO3	1 ✓	MW-104	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
0084068-09 B	10/1/20	925	Preservation Check: pH : ✓ Plastic 1L	1	MW-104	g / c	pH (Lab) Conductivity (Lab) TDS Sulfate 9056 Chloride 9056 Fluoride 9056

0101831 Acl 10-1-20

Preservation Check Performed by: Acl

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/1/20 Time (24 hr) 925

pH 6.91 Cond ~~(umho)~~ mS/cm 6.71 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.48 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)
	abbyLaue	10/1/20	1531

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation
Reid/Green Station

Project: Green Landfill Semiannual Groundwater

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084068 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084068-09 C	10/1/20	925	Plastic 500mL pH<2 w/H2SO4	1	MW-104	g / c	COD TOC
			Preservation Check: pH : ✓				
0084068-09 D	10/1/20	925	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-104	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084068-09 E	10/1/20	925	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-09 F	10/1/20	925	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-104	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084068-09 G	10/1/20	925	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-104	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084068-09 H	10/1/20	925	AG 250mL pH<2 w/H2SO4	1	MW-104	g / c	TOC
			Preservation Check: pH : ✓				

0101831 ACI 10-1-20

Preservation Check Performed by: ACI

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/1/20 Time (24 hr) 925

pH 6.91 Cond ~~(umho)~~ mS/cm 6.71 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.48 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)
	abbyLark	10/1/20	1531

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 8/26/2020 9:04:15AM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

October 22, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 101831
Pace Project No.: 30385782

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on October 06, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 101831
Pace Project No.: 30385782

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 101831
Pace Project No.: 30385782

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30385782001	**0101831-01**	Water	10/01/20 09:25	10/06/20 09:45

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 101831
Pace Project No.: 30385782

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30385782001	**0101831-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 101831
Pace Project No.: 30385782

Sample: 0101831-01 **Lab ID: 30385782001** Collected: 10/01/20 09:25 Received: 10/06/20 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection time on containers does not match COC; client was notified.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.380 (0.789) C:NA T:95%**	pCi/L	10/21/20 12:20	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.422 ± 0.396 (0.814) C:83% T:83%**	pCi/L	10/21/20 14:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.422 ± 0.776 (1.60)**	pCi/L	10/22/20 12:35	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 101831
Pace Project No.: 30385782

QC Batch: 418100
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30385782001

METHOD BLANK: 2021261 Matrix: Water
Associated Lab Samples: 30385782001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0279 ± 0.295 (0.681) C:84% T:85%	pCi/L	10/21/20 14:23	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 101831
Pace Project No.: 30385782

QC Batch: 418098
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30385782001

METHOD BLANK: 2021260 Matrix: Water
Associated Lab Samples: 30385782001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.104 ± 0.407 (0.779) C:NA T:84%	pCi/L	10/21/20 11:46	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 101831
Pace Project No.: 30385782

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.

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.

WO# : 30385782

30385782

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 101831 Workorder Name: Green Landfill Semiannual Owner Received Date: 10/1/2020 Results Requested By:

Report To:	Subcontract To:	Requested Analysis

McCoy & McCoy Labs
P.O. Box 907
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-S615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	EPA 903.1	EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	0101831-01		10/01/20 09:25	IR44-McCoy	Water		X	X	
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1				10/1/2020 0948	
2					
3					

Cooler Temperature on Receipt 3.5 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

30385782

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0101831

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: 0101831-01	**Water**	**Sampled:10/01/2020 09:25**	**Specific Method**	
Radium Total (sub)		03/30/2021 09:25	EPA 904.0 Radium Sum C	
Radium 228 (sub)		03/30/2021 09:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/30/2021 09:25	EPA 903.1	

Released By	Date	Received By	Date
	10-5-20	A Thock	10/6/20 09:45
Released By	Date	Received By	Date

Sample Custody

By Abbey Larkins

Printed 10/05/2020 09:31

30385782

Lab ID	Container	Cooler	Last Owner	Department	Location	Home Location	Status	Disposition	Custody Date
0101830-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101830-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101830-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101830-01	Plastic 1L pH<2 w/HNO3 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101831-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101831-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101831-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05
0101831-01	Plastic 1L pH<2 w/HNO3 (Sub)	Default Cooler	AEL	Wet Chem	In-Transit		Reviewed Active	(Out)	10/05/2020 09:05

Relinquished By	Date	Received By	Date
abby Larkins	10-5-20		
Relinquished By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: PACE KY

Project # # 30385782

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label DSM
LIMS Login KJM

Tracking #: 110733868654

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used 10 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 4.0 °C Correction Factor: 0.5 °C Final Temp: 3.5 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D0401 / Date and Initials of person examining contents: AF 10/6/20
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: Wt		✓		5. time on sample 3:40 C.o.c. 09:25
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed AF / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: AF Date: 10/6/20

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Appendix F
Green Surface Impoundment Analytical Laboratory Reports

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
0041388

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 04/20/2020 09:24

Project Name:	Green Surface Impoundment	Workorder:	0041388

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/08/2020 14:18.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0041388-01	MW11/	Groundwater	04/08/2020 09:25	04/08/2020 14:18	Phillip Hill
0041388-02	MW12/	Groundwater	04/08/2020 09:05	04/08/2020 14:18	Phillip Hill
0041388-03	MW13/	Groundwater	04/08/2020 10:25	04/08/2020 14:18	Phillip Hill
0041388-04	MW14/	Groundwater	04/08/2020 11:00	04/08/2020 14:18	Phillip Hill
0041388-05	DUPLICATE/	Groundwater	04/08/2020 09:20	04/08/2020 14:18	Phillip Hill
0041388-06	FIELD BLANK/	Water	04/08/2020 10:37	04/08/2020 14:18	Phillip Hill

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Madisonville, KY 42431
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www.pacelabs.com

ANALYTICAL RESULTS

Lab Sample ID: **0041388-01**
Description: **MW11**

Sample Collection Date Time: 04/08/2020 09:25
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	**0.78**	M2, M4	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 16:38	AKB
Calcium	**316**	D1, M2	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 12:00	04/15/2020 16:44	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.05**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:22	04/09/2020 16:22	CML
Total Dissolved Solids	**4650**		mg/L	50	50	2540 C-2011	04/09/2020 10:46	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**2270**	D	mg/L	100	64.0	SW846 9056	04/17/2020 05:43	04/17/2020 05:43	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	04/17/2020 05:26	04/17/2020 05:26	CSC
Sulfate	**1210**	D	mg/L	50	25	SW846 9056	04/17/2020 05:43	04/17/2020 05:43	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0041388-02**
Description: **MW12**

Sample Collection Date Time: 04/08/2020 09:05
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	**0.31**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 16:47	AKB
Calcium	**98.3**	D2	mg/L	4.00	1.30	SW846 6010 B	04/09/2020 12:00	04/15/2020 16:50	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.27**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:23	04/09/2020 16:23	CML
Total Dissolved Solids	**532**		mg/L	50	50	2540 C-2011	04/09/2020 10:50	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**13.9**		mg/L	2.0	1.3	SW846 9056	04/17/2020 06:00	04/17/2020 06:00	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/17/2020 06:00	04/17/2020 06:00	CSC
Sulfate	**9**		mg/L	1	0.5	SW846 9056	04/17/2020 06:00	04/17/2020 06:00	CSC

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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **0041388-03**
Description: **MW13**

Sample Collection Date Time: 04/08/2020 10:25
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 16:57	AKB
Calcium	**86.6**	D2	mg/L	4.00	1.30	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:09	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.97**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:27	04/09/2020 16:27	CML
Total Dissolved Solids	**608**		mg/L	50	50	2540 C-2011	04/09/2020 10:54	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**22.8**		mg/L	2.0	1.3	SW846 9056	04/17/2020 06:16	04/17/2020 06:16	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/17/2020 06:16	04/17/2020 06:16	CSC
Sulfate	**117**	D	mg/L	20	10	SW846 9056	04/17/2020 15:01	04/17/2020 15:01	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0041388-04**
Description: **MW14**

Sample Collection Date Time: 04/08/2020 11:00
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	**0.20**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:16	AKB
Calcium	**195**	D1	mg/L	40.0	13.0	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:22	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.97**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:28	04/09/2020 16:28	CML
Total Dissolved Solids	**1030**		mg/L	50	50	2540 C-2011	04/09/2020 10:58	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**121**	D	mg/L	100	64.0	SW846 9056	04/17/2020 06:50	04/17/2020 06:50	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/17/2020 06:33	04/17/2020 06:33	CSC
Sulfate	**183**	D	mg/L	50	25	SW846 9056	04/17/2020 06:50	04/17/2020 06:50	CSC

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Madisonville, KY 42431
270.821.7375
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ANALYTICAL RESULTS

Lab Sample ID: **0041388-05**
Description: **DUPLICATE**

Sample Collection Date Time: 04/08/2020 09:20
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	**0.31**		mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:25	AKB
Calcium	**90.3**	D2	mg/L	4.00	1.30	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:28	AKB

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	04/09/2020 16:29	04/09/2020 16:29	CML
Total Dissolved Solids	**528**		mg/L	50	50	2540 C-2011	04/09/2020 11:02	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**14.3**		mg/L	2.0	1.3	SW846 9056	04/17/2020 07:06	04/17/2020 07:06	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/17/2020 07:06	04/17/2020 07:06	CSC
Sulfate	**10**		mg/L	1	0.5	SW846 9056	04/17/2020 07:06	04/17/2020 07:06	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0041388-06**
Description: **FIELD BLANK**

Sample Collection Date Time: 04/08/2020 10:37
Sample Received Date Time: 04/08/2020 14:18

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:35	AKB
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	04/09/2020 12:00	04/15/2020 17:35	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.75**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/09/2020 16:30	04/09/2020 16:30	CML
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	04/09/2020 11:06	04/10/2020 13:01	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	2.0	1.3	SW846 9056	04/17/2020 07:23	04/17/2020 07:23	CSC
Fluoride	ND	U	mg/L	0.2	0.1	SW846 9056	04/17/2020 07:23	04/17/2020 07:23	CSC
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	04/17/2020 07:23	04/17/2020 07:23	CSC

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
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Notes for work order 0041388

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
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.
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/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015404 - EPA 200.2										
Blank (B015404-BLK1)										
Prepared: 4/9/2020 12:00, Analyzed: 4/15/2020 16:32										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
LCS (B015404-BS1)										
Prepared: 4/9/2020 12:00, Analyzed: 4/15/2020 16:35										
Boron	0.13	0.10	mg/L	0.125		102	85-115			
Calcium	5.95	0.40	mg/L	6.25		95.3	85-115			
Matrix Spike (B015404-MS1) **Source: 0041388-01**										
Prepared: 4/9/2020 12:00, Analyzed: 4/15/2020 18:00										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	306	40.0	mg/L	6.25	316	NR	80-120			D2, M2
Matrix Spike Dup (B015404-MSD1) **Source: 0041388-01**										
Prepared: 4/9/2020 12:00, Analyzed: 4/15/2020 18:03										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	308	40.0	mg/L	6.25	316	NR	80-120	0.454	20	D2, M2
Post Spike (B015404-PS1) **Source: 0041388-01**										
Prepared: 4/9/2020 12:00, Analyzed: 4/15/2020 18:06										
Boron	858		ug/L	125	776	65.5	75-125			D2, M2
Calcium	317000		ug/L	6250	316000	10.6	75-125			D2, M2

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B015421 - Default Prep Wet Chem										
Blank (B015421-BLK1)										
Prepared: 4/9/2020 10:14, Analyzed: 4/10/2020 13:01										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B015421-BS1)										
Prepared: 4/9/2020 10:18, Analyzed: 4/10/2020 13:01										
Total Dissolved Solids	1430	25	mg/L	1500		95.5	80-120			
Duplicate (B015421-DUP1)	**Source: 0040771-01**									
Prepared: 4/9/2020 11:10, Analyzed: 4/10/2020 13:01										
Total Dissolved Solids	250	50	mg/L		246			1.61	10	
Duplicate (B015421-DUP2)	**Source: 0041388-01**									
Prepared: 4/9/2020 11:14, Analyzed: 4/10/2020 13:01										
Total Dissolved Solids	4690	50	mg/L		4650			0.771	10	
Batch B015469 - Default Prep Wet Chem										
LCS (B015469-BS1)										
Prepared: 4/9/2020 16:08, Analyzed: 4/9/2020 16:08										
pH (Lab)	7.98		Std. Units	8.00		99.8	98.8-101.2			
LCS (B015469-BS2)										
Prepared: 4/9/2020 16:26, Analyzed: 4/9/2020 16:26										
pH (Lab)	8.04		Std. Units	8.00		100	98.8-101.2			
Duplicate (B015469-DUP1)	**Source: 0041388-02**									
Prepared: 4/9/2020 16:24, Analyzed: 4/9/2020 16:24										
pH (Lab)	7.29	0.10	Std. Units		7.27			0.275	10	
Duplicate (B015469-DUP2)	**Source: 0060028-01**									
Prepared: 4/9/2020 16:34, Analyzed: 4/9/2020 16:34										
pH (Lab)	7.77	0.10	Std. Units		7.76			0.129	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016445 - Default Prep IC										
Blank (B016445-BLK1)										
Prepared: 4/17/2020 4:36, Analyzed: 4/17/2020 4:36										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
Matrix Spike (B016445-MS1) **Source: 0041021-01**										
Prepared: 4/17/2020 8:12, Analyzed: 4/17/2020 8:12										
Fluoride	13.4		mg/L	10.0	0.8	126	75-125			M1
Chloride	13.1		mg/L	10.0	14.2	NR	75-125			M2
Sulfate	14		mg/L	10.0	12	22.7	75-125			M2
Matrix Spike Dup (B016445-MSD1) **Source: 0041021-01**										
Prepared: 4/17/2020 8:29, Analyzed: 4/17/2020 8:29										
Chloride	10.7		mg/L	10.0	14.2	NR	75-125	20.4	15	M2, Y2
Fluoride	10.9		mg/L	10.0	0.8	102	75-125	20.3	15	Y2
Sulfate	11		mg/L	10.0	12	NR	75-125	21.4	15	M2, Y2
Batch B016536 - Default Prep IC										
Blank (B016536-BLK1)										
Prepared: 4/17/2020 13:39, Analyzed: 4/17/2020 13:39										
Sulfate	ND	1	mg/L							U
LCS (B016536-BS1)										
Prepared: 4/17/2020 13:23, Analyzed: 4/17/2020 13:23										
Sulfate	10		mg/L	10.0		98.2	90-110			
Matrix Spike (B016536-MS1) **Source: 0042985-01**										
Prepared: 4/17/2020 15:34, Analyzed: 4/17/2020 15:34										
Sulfate	31		mg/L	10.0	21	101	75-125			
Matrix Spike Dup (B016536-MSD1) **Source: 0042985-01**										
Prepared: 4/17/2020 15:50, Analyzed: 4/17/2020 15:50										
Sulfate	33		mg/L	10.0	21	115	75-125	4.46	15	

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

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Sample Acceptance Checklist for Work Order 0041388

Shipped By: Client

Temperature: 1.90° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No

*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) ____

MMLI USE ONLY Workorder # 0041388 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041388-01 A	4/8/20	925	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW11	g / c	Boron Tot 6010B Calcium Tot 6010B
0041388-01 B	4/8/20	925	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW11	g / c	Boron Tot 6010B Calcium Tot 6010B
0041388-01 C	4/8/20	925	Plastic 1L	1	MW11	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
0041388-02 A	4/8/20	905	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-02 B	4/8/20	905	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-02 C	4/8/20	905	Plastic 1L	1	MW12	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
0041388-03 A	4/8/20	1025	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B

Preservation Check Performed by: NOY 1.9

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/8/20 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)
		4/8/20	1300
		4-8-20	1418

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Printed: 3/25/2020 2:56:03PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) ___

MMLI USE ONLY Workorder # 0041388 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041388-03 B	4/8/20	1025	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-03 C	4/8/20	1025	Plastic 1L	1	MW13	g / c	Fluoride 9056 pH (Lab) Chloride 9056 Sulfate 9056 TDS
0041388-04 A	4/8/20	1100	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-04 B	4/8/20	1100	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-04 C	4/8/20	1100	Plastic 1L	1	MW14	g / c	Chloride 9056 pH (Lab) Sulfate 9056 Fluoride 9056 TDS
0041388-05 A	4/8/20	920	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-05 B	4/8/20	920	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-05 C	4/8/20	920	Plastic 1L	1	DUPLICATE	g / c	Fluoride 9056 Sulfate 9056 TDS pH (Lab) Chloride 9056

Preservation Check Performed by: NDY 1.9

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)
		4/8/20	1300
		4-8-20	1418

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Printed: 3/25/2020 2:56:03PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

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Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X 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) _____

MMLI USE ONLY Workorder # 0041388 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041388-06 A	4/8/20	1037	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : 1	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-06 B	4/8/20	1037	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : 1	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
0041388-06 C	4/8/20	1037	Plastic 1L	1	FIELD BLANK	g / c	pH (Lab) Fluoride 9056 Chloride 9056 TDS Sulfate 9056

1.9

Preservation Check Performed by: NOY

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)
		4/8/20	1300
		4-8-20	1418

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Printed: 3/25/2020 2:56:03PM

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Certificate of Analysis
0084067

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 10/06/2020 16:31

Project Name:	Green Surface Impoundment	Workorder:	0084067

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 09/25/2020 15:25.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0084067-01	MW11/	Groundwater	09/25/2020 12:00	09/25/2020 15:25	Phillip Hill
0084067-02	MW12/	Groundwater	09/25/2020 12:45	09/25/2020 15:25	Phillip Hill
0084067-03	MW13/	Groundwater	09/25/2020 13:30	09/25/2020 15:25	Phillip Hill
0084067-04	MW14/	Groundwater	09/25/2020 14:25	09/25/2020 15:25	Phillip Hill
0084067-05	DUPLICATE/	Groundwater	09/25/2020 14:35	09/25/2020 15:25	Phillip Hill
0084067-06	FIELD BLANK/	Water	09/25/2020 14:45	09/25/2020 15:25	Phillip Hill

LabNumber	Measurement	Value
0084067-01	Field Conductance	5840
	Field pH	6.98
	Field Temp (C)	19.83
0084067-03	Field Conductance	802
	Field pH	6.8
	Field Temp (C)	19.2

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ANALYTICAL RESULTS

Lab Sample ID: **0084067-01**
Description: **MW11**

Sample Collection Date Time: 09/25/2020 12:00
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	D2, M2, U	mg/L	1.00	1.00	SW846 6010 B	09/29/2020 08:21	09/29/2020 16:58	AKB
Calcium	**335**	D2, M3	mg/L	40.0	13.0	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:11	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.92**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:22	09/29/2020 14:22	CML
Total Dissolved Solids	**4510**		mg/L	50	50	2540 C-2011	09/30/2020 13:38	10/01/2020 15:25	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**2620**	D	mg/L	400	256	SW846 9056	10/06/2020 10:38	10/06/2020 10:38	CSC
Fluoride	**0.2**		mg/L	0.2	0.1	SW846 9056	10/02/2020 15:21	10/02/2020 15:21	CSC
Sulfate	**1280**	D	mg/L	200	100	SW846 9056	10/06/2020 10:38	10/06/2020 10:38	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0084067-02**
Description: **MW12**

Sample Collection Date Time: 09/25/2020 12:45
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	D2, U	mg/L	1.00	1.00	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:14	AKB
Calcium	**89.6**	D2	mg/L	4.00	1.30	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:14	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.15**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:23	09/29/2020 14:23	CML
Total Dissolved Solids	**658**		mg/L	50	50	2540 C-2011	09/30/2020 13:42	10/01/2020 15:25	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**13.5**		mg/L	2.0	1.3	SW846 9056	10/02/2020 15:36	10/02/2020 15:36	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	10/02/2020 15:36	10/02/2020 15:36	CSC
Sulfate	**8**		mg/L	1	0.5	SW846 9056	10/02/2020 15:36	10/02/2020 15:36	CSC

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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **0084067-03**
Description: **MW13**

Sample Collection Date Time: 09/25/2020 13:30
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	D2, U	mg/L	1.00	1.00	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:20	AKB
Calcium	**84.9**	D2	mg/L	4.00	1.30	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:20	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.90**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:24	09/29/2020 14:24	CML
Total Dissolved Solids	**552**		mg/L	50	50	2540 C-2011	09/30/2020 13:46	10/01/2020 15:25	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**33.3**	D	mg/L	4.0	2.6	SW846 9056	10/02/2020 15:51	10/02/2020 15:51	CSC
Fluoride	**0.4**	D	mg/L	0.4	0.2	SW846 9056	10/02/2020 15:51	10/02/2020 15:51	CSC
Sulfate	**87**	D	mg/L	50	25	SW846 9056	10/05/2020 12:29	10/05/2020 12:29	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0084067-04**
Description: **MW14**

Sample Collection Date Time: 09/25/2020 14:25
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	D2, U	mg/L	1.00	1.00	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:27	AKB
Calcium	**194**	D2	mg/L	40.0	13.0	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:30	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.94**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:25	09/29/2020 14:25	CML
Total Dissolved Solids	**946**		mg/L	50	50	2540 C-2011	09/30/2020 13:50	10/01/2020 15:25	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**131**	D	mg/L	100	64.0	SW846 9056	10/02/2020 16:22	10/02/2020 16:22	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	10/02/2020 16:07	10/02/2020 16:07	CSC
Sulfate	**221**	D	mg/L	50	25	SW846 9056	10/02/2020 16:22	10/02/2020 16:22	CSC

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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **0084067-05**
Description: **DUPLICATE**

Sample Collection Date Time: 09/25/2020 14:35
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	D2, U	mg/L	1.00	1.00	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:33	AKB
Calcium	**199**	D2	mg/L	40.0	13.0	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:36	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**6.97**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:29	09/29/2020 14:29	CML
Total Dissolved Solids	**916**		mg/L	50	50	2540 C-2011	09/30/2020 15:46	10/01/2020 15:15	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**165**	D	mg/L	100	64.0	SW846 9056	10/06/2020 15:00	10/06/2020 15:00	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	10/02/2020 16:38	10/02/2020 16:38	CSC
Sulfate	**249**	D	mg/L	100	50	SW846 9056	10/02/2020 16:53	10/02/2020 16:53	CSC

ANALYTICAL RESULTS

Lab Sample ID: **0084067-06**
Description: **FIELD BLANK**

Sample Collection Date Time: 09/25/2020 14:45
Sample Received Date Time: 09/25/2020 15:25

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:49	AKB
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	09/29/2020 08:21	09/29/2020 17:49	AKB

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**8.00**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:30	09/29/2020 14:30	CML
Total Dissolved Solids	**112**		mg/L	50	50	2540 C-2011	09/30/2020 15:50	10/01/2020 15:15	MAG

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	2.0	1.3	SW846 9056	10/02/2020 17:09	10/02/2020 17:09	CSC
Fluoride	ND	U	mg/L	0.2	0.1	SW846 9056	10/02/2020 17:09	10/02/2020 17:09	CSC
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	10/02/2020 17:09	10/02/2020 17:09	CSC

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Notes for work order 0084067

- 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.
D2	Sample required dilution due to matrix interference.
H1	Sample analysis performed 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/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Results relate only to the items tested.

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040054 - EPA 200.2										
Blank (B040054-BLK1)										
Prepared: 9/29/2020 8:21, Analyzed: 9/29/2020 16:52										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
LCS (B040054-BS1)										
Prepared: 9/29/2020 8:21, Analyzed: 9/29/2020 16:55										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.46	0.40	mg/L	6.25		103	85-115			
Matrix Spike (B040054-MS1) **Source: 0084067-01**										
Prepared: 9/29/2020 8:21, Analyzed: 9/29/2020 17:52										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M2, U
Calcium	349	40.0	mg/L	6.25	335	223	80-120			D2, M3
Matrix Spike Dup (B040054-MSD1) **Source: 0084067-01**										
Prepared: 9/29/2020 8:21, Analyzed: 9/29/2020 17:55										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M2, U
Calcium	350	40.0	mg/L	6.25	335	225	80-120	0.0329	20	D2, M3
Post Spike (B040054-PS1) **Source: 0084067-01**										
Prepared: 9/29/2020 8:21, Analyzed: 9/29/2020 17:58										
Boron	776		ug/L	125	744	25.4	75-125			D2, M2
Calcium	337000		ug/L	6250	335000	16.6	75-125			D2, M3

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040197 - Default Prep Wet Chem										
LCS (B040197-BS1)										
Prepared: 9/29/2020 14:15, Analyzed: 9/29/2020 14:15										
pH (Lab)	8.02		Std. Units	8.00		100	98.8-101.2			
LCS (B040197-BS2)										
Prepared: 9/29/2020 14:28, Analyzed: 9/29/2020 14:28										
pH (Lab)	8.00		Std. Units	8.00		100	98.8-101.2			
Duplicate (B040197-DUP1) **Source: 0084067-04**										
Prepared: 9/29/2020 14:26, Analyzed: 9/29/2020 14:26										
pH (Lab)	6.95	0.10	Std. Units		6.94			0.144	10	
Duplicate (B040197-DUP2) **Source: 0093815-01**										
Prepared: 9/29/2020 14:41, Analyzed: 9/29/2020 14:41										
pH (Lab)	7.48	0.10	Std. Units		7.45			0.402	10	
Batch B040276 - Default Prep Wet Chem										
Blank (B040276-BLK1)										
Prepared: 9/30/2020 13:14, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B040276-BS1)										
Prepared: 9/30/2020 13:18, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	1430	25	mg/L	1500		95.2	80-120			
Duplicate (B040276-DUP1) **Source: 0084065-03**										
Prepared: 9/30/2020 14:42, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	316	50	mg/L		308			2.56	10	
Duplicate (B040276-DUP2) **Source: 0093656-01**										
Prepared: 9/30/2020 14:46, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	8930	50	mg/L		8980			0.580	10	
Batch B040331 - Default Prep Wet Chem										
Blank (B040331-BLK1)										
Prepared: 9/30/2020 15:34, Analyzed: 10/1/2020 15:15										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040331 - Default Prep Wet Chem										
LCS (B040331-BS1)										
Prepared: 9/30/2020 15:38, Analyzed: 10/1/2020 15:15										
Total Dissolved Solids	1450	25	mg/L	1500		96.6	80-120			
Duplicate (B040331-DUP1)	**Source: 0084067-05**									
Prepared: 9/30/2020 16:18, Analyzed: 10/1/2020 15:15										
Total Dissolved Solids	924	50	mg/L		916			0.870	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040522 - Default Prep IC										
Blank (B040522-BLK1)										
Prepared: 10/2/2020 14:35, Analyzed: 10/2/2020 14:35										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B040522-BS1)										
Prepared: 10/2/2020 14:19, Analyzed: 10/2/2020 14:19										
Chloride	9.7		mg/L	10.0		97.0	90-110			
Fluoride	9.5		mg/L	10.0		94.8	90-110			
Sulfate	9		mg/L	10.0		94.6	90-110			
Matrix Spike (B040522-MS1) **Source: 0093742-01**										
Prepared: 10/2/2020 18:41, Analyzed: 10/2/2020 18:41										
Fluoride	12.4		mg/L	10.0	0.07	123	75-125			
Chloride	13.2		mg/L	10.0	0.6	126	75-125			M1
Sulfate	13		mg/L	10.0	0.4	125	75-125			
Matrix Spike Dup (B040522-MSD1) **Source: 0093742-01**										
Prepared: 10/2/2020 18:57, Analyzed: 10/2/2020 18:57										
Chloride	13.0		mg/L	10.0	0.6	124	75-125	1.40	15	
Fluoride	12.2		mg/L	10.0	0.07	122	75-125	1.15	15	
Sulfate	13		mg/L	10.0	0.4	123	75-125	1.66	15	
Batch B041179 - Default Prep IC										
Blank (B041179-BLK1)										
Prepared: 10/6/2020 11:39, Analyzed: 10/6/2020 11:39										
Chloride	ND	2.0	mg/L							U
LCS (B041179-BS1)										
Prepared: 10/6/2020 11:24, Analyzed: 10/6/2020 11:24										
Chloride	9.7		mg/L	10.0		96.7	90-110			

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B041179 - Default Prep IC										
Matrix Spike (B041179-MS1) **Source: 0102413-01**										
Prepared: 10/6/2020 15:31, Analyzed: 10/6/2020 15:31										
Chloride	38.4		mg/L	10.0	31.2	72.8	75-125			M2
Matrix Spike Dup (B041179-MSD1) **Source: 0102413-01**										
Prepared: 10/6/2020 15:46, Analyzed: 10/6/2020 15:46										
Chloride	38.1		mg/L	10.0	31.2	69.6	75-125	0.846	15	M2

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

Sample Acceptance Checklist for Work Order 0084067

Shipped By: Client

Temperature: 1.50° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
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Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084067 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084067-01 A	9/25/20	1200	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : √				
0084067-01 B	9/25/20	1200	Plastic 500mL pH<2 w/HNO3	1	MW11	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : √				
0084067-01 C	9/25/20	1200	Plastic 1L	1	MW11	g / c	Chloride 9056 pH (Lab) Sulfate 9056 Fluoride 9056 TDS
0084067-02 A	9/25/20	1245	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : √				
0084067-02 B	9/25/20	1245	Plastic 500mL pH<2 w/HNO3	1	MW12	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : √				
0084067-02 C	9/25/20	1245	Plastic 1L	1	MW12	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/25/20 Time (24 hr) 1200 MW11

pH 6.98 Cond ~~umho~~ mS/cm 5.84 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 19.83 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)
	Abby Faulkner	9/25/20	1525

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Printed: 8/26/2020 9:04:00AM

1.5

Pace Analytical Services LLC Kentucky
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Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084067 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084067-03 A	9/25/20	1330	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-03 B	9/25/20	1330	Plastic 500mL pH<2 w/HNO3	1	MW13	g / c	Boron Tot 6010B Calcium Tot 6010B
			Preservation Check: pH : ✓				
0084067-03 C	9/25/20	1330	Plastic 1L	1	MW13	g / c	pH (Lab) TDS Fluoride 9056 Chloride 9056 Sulfate 9056
0084067-04 A	9/25/20	1425	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-04 B	9/25/20	1425	Plastic 500mL pH<2 w/HNO3	1	MW14	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-04 C	9/25/20	1425	Plastic 1L	1	MW14	g / c	TDS Sulfate 9056 pH (Lab) Fluoride 9056 Chloride 9056
0084067-05 A	9/25/20	1435	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Boron Tot 6010B Calcium Tot 6010B
			Preservation Check: pH : ✓				

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/25/20 Time (24 hr) 1330 MW13

pH 6.80 Cond ~~(umho)~~ mS/cm 0.802 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 19.20 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)
		9/25/20	1525

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 8/26/2020 9:04:00AM

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: Green Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084067 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084067-05 B	9/25/20	1435	Plastic 500mL pH<2 w/HNO3	1	DUPLICATE	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-05 C	9/25/20	1435	Plastic 1L	1	DUPLICATE	g / c	Sulfate 9056 TDS pH (Lab) Fluoride 9056 Chloride 9056
0084067-06 A	9/25/20	1445	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-06 B	9/25/20	1445	Plastic 500mL pH<2 w/HNO3	1	FIELD BLANK	g / c	Calcium Tot 6010B Boron Tot 6010B
			Preservation Check: pH : ✓				
0084067-06 C	9/25/20	1445	Plastic 1L	1	FIELD BLANK	g / c	TDS Sulfate 9056 pH (Lab) Chloride 9056 Fluoride 9056

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/25/20 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)
		9/25/20	1525

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Printed: 8/26/2020 9:04:00AM

Appendix G
Reid/HMP&L Surface Impoundment Analytical Laboratory Reports

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Certificate of Analysis
0042891

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 05/12/2020 13:26

Project Name:	HMPL Surface Impoundment	Workorder:	0042891

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/16/2020 14:53.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0042891-01	MW7/	Groundwater	04/16/2020 09:15	04/16/2020 14:53	Phillip Hill
0042891-02	MW8/	Groundwater	04/16/2020 10:50	04/16/2020 14:53	Phillip Hill
0042891-03	MW9/	Groundwater	04/16/2020 12:15	04/16/2020 14:53	Phillip Hill
0042891-04	MW10/	Groundwater	04/16/2020 13:25	04/16/2020 14:53	Phillip Hill
0042891-05	DUPLICATE/	Groundwater	04/16/2020 11:15	04/16/2020 14:53	Phillip Hill
0042891-06	FIELD BLANK/	Water	04/16/2020 13:45	04/16/2020 14:53	Phillip Hill

LabNumber	Measurement	Value
0042891-01	Field Conductance	428
	Field pH	6.86
	Field Temp (C)	13.38
0042891-02	Field Conductance	2660
	Field pH	6.78
	Field Temp (C)	14.38
0042891-03	Field Conductance	594
	Field pH	7.04
	Field Temp (C)	16.41
0042891-04	Field Conductance	810
	Field pH	8.87
	Field Temp (C)	17.13
0042891-05	Field Conductance	2660
	Field pH	6.78
	Field Temp (C)	14.38

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-01**
Description: **MW7**

Sample Collection Date Time: 04/16/2020 09:15
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Arsenic	**0.0025**		mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Barium	**0.087**		mg/L	0.004	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Boron	**0.34**	M4	mg/L	0.10	0.10	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:16	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Calcium	**45.7**	D2, M2	mg/L	4.00	1.30	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:19	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Lithium	**0.007**	V1, J	mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Molybdenum	**0.006**	J	mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:20	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.51**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:27	04/20/2020 14:27	GAT
Total Dissolved Solids	**148**		mg/L	50	50	2540 C-2011	04/17/2020 11:38	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.613**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**1.22**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**1.83**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**4.1**		mg/L	2.0	1.3	SW846 9056	04/27/2020 11:04	04/27/2020 11:04	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/27/2020 11:04	04/27/2020 11:04	CSC
Sulfate	**15**		mg/L	1	0.5	SW846 9056	04/27/2020 11:04	04/27/2020 11:04	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-02**
Description: **MW8**

Sample Collection Date Time: 04/16/2020 10:50
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Barium	**0.017**		mg/L	0.004	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Boron	**1.56**	D1	mg/L	1.00	1.00	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:29	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Calcium	**292**	D1	mg/L	40.0	13.0	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:32	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/26/2020 14:50	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Molybdenum	**0.01**		mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:43	DMH

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	04/20/2020 14:28	04/20/2020 14:28	GAT
Total Dissolved Solids	**1930**		mg/L	50	50	2540 C-2011	04/17/2020 11:42	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.490**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**1.44**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**1.93**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**47.3**		mg/L	2.0	1.3	SW846 9056	04/27/2020 11:25	04/27/2020 11:25	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/27/2020 11:25	04/27/2020 11:25	CSC
Sulfate	**1130**	D	mg/L	50	25	SW846 9056	04/27/2020 11:45	04/27/2020 11:45	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-03**
Description: **MW9**

Sample Collection Date Time: 04/16/2020 12:15
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Barium	**1.06**	D1	mg/L	0.040	0.010	SW846-6020 A	04/20/2020 07:50	04/26/2020 14:54	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Boron	**0.32**		mg/L	0.10	0.10	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:35	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Calcium	**71.2**	D2	mg/L	4.00	1.30	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:38	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Lithium	**0.01**	V1, J	mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:47	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.35**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:29	04/20/2020 14:29	GAT
Total Dissolved Solids	**320**		mg/L	50	50	2540 C-2011	04/17/2020 11:46	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**1.39**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**1.51**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**2.90**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**22.8**		mg/L	2.0	1.3	SW846 9056	04/27/2020 12:26	04/27/2020 12:26	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/27/2020 12:26	04/27/2020 12:26	CSC
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	04/27/2020 12:26	04/27/2020 12:26	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-04**
Description: **MW10**

Sample Collection Date Time: 04/16/2020 13:25
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Arsenic	**0.0019**		mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Barium	**0.093**		mg/L	0.004	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Boron	**0.54**		mg/L	0.10	0.10	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:54	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Calcium	**12.5**	D2	mg/L	4.00	1.30	SW846 6010 B	04/20/2020 07:50	04/24/2020 11:57	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Lithium	**0.49**		mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/26/2020 14:58	DMH
Mercury	**0.0002**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Molybdenum	**0.006**	J	mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:51	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**9.09**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:30	04/20/2020 14:30	GAT
Total Dissolved Solids	**466**		mg/L	50	50	2540 C-2011	04/17/2020 11:50	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.598**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**0.643**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**1.24**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**21.5**		mg/L	2.0	1.3	SW846 9056	04/27/2020 12:46	04/27/2020 12:46	CSC
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	04/27/2020 12:46	04/27/2020 12:46	CSC
Sulfate	**58**	D	mg/L	20	10	SW846 9056	04/27/2020 13:07	04/27/2020 13:07	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-05**
Description: **DUPLICATE**

Sample Collection Date Time: 04/16/2020 11:15
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Barium	**0.017**		mg/L	0.004	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Boron	**1.49**	D1	mg/L	1.00	1.00	SW846 6010 B	04/20/2020 07:50	04/24/2020 12:07	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Calcium	**286**	D1	mg/L	40.0	13.0	SW846 6010 B	04/20/2020 07:50	04/24/2020 12:10	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/26/2020 15:02	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Molybdenum	**0.01**		mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:55	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.27**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:31	04/20/2020 14:31	GAT
Total Dissolved Solids	**1860**		mg/L	50	50	2540 C-2011	04/17/2020 11:54	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.378**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**1.09**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**1.47**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**47.8**		mg/L	2.0	1.3	SW846 9056	04/27/2020 13:27	04/27/2020 13:27	CSC
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	04/27/2020 13:27	04/27/2020 13:27	CSC
Sulfate	**1560**	D	mg/L	50	25	SW846 9056	04/27/2020 13:47	04/27/2020 13:47	CSC

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ANALYTICAL RESULTS

Lab Sample ID: **0042891-06**
Description: **FIELD BLANK**

Sample Collection Date Time: 04/16/2020 13:45
Sample Received Date Time: 04/16/2020 14:53

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Beryllium	ND	V1, U	mg/L	0.0020	0.0010	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	04/20/2020 07:50	04/24/2020 12:13	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	04/20/2020 07:50	04/24/2020 12:13	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Lithium	ND	V1, U	mg/L	0.02	0.005	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/20/2020 07:50	04/24/2020 18:24	DMH

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	4500-H+ B-2000	04/20/2020 14:32	04/20/2020 14:32	GAT
Total Dissolved Solids	ND	U	mg/L	50	50	2540 C-2011	04/17/2020 11:58	04/18/2020 14:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.109**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**0.718**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**0.827**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	2.0	1.3	SW846 9056	04/27/2020 15:09	04/27/2020 15:09	CSC
Fluoride	ND	U	mg/L	0.2	0.1	SW846 9056	04/27/2020 15:09	04/27/2020 15:09	CSC
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	04/27/2020 15:09	04/27/2020 15:09	CSC

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Notes for work order 0042891

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
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.
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.

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016507 - EPA 200.2										
Blank (B016507-BLK1)										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 11:00										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Blank (B016507-BLK2)										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 18:13										
Antimony	ND	0.005	mg/L							U
Mercury	ND	0.0005	mg/L							U
Molybdenum	ND	0.01	mg/L							U
Arsenic	ND	0.0010	mg/L							U
Barium	ND	0.004	mg/L							U
Beryllium	ND	0.0020	mg/L							U
Cadmium	ND	0.0010	mg/L							U
Chromium	ND	0.0020	mg/L							U
Cobalt	ND	0.004	mg/L							U
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 (B016507-BS1)										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 11:04										
Boron	0.13	0.10	mg/L	0.125		102	85-115			
Calcium	6.58	0.40	mg/L	6.25		105	85-115			
LCS (B016507-BS2)										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 18:17										
Mercury	0.0027	0.0005	mg/L	0.00250		106	85-115			
Molybdenum	0.06	0.01	mg/L	0.0625		102	85-115			
Antimony	0.069	0.005	mg/L	0.0625		110	85-115			
Arsenic	0.0645	0.0010	mg/L	0.0625		103	85-115			
Barium	0.065	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0719	0.0020	mg/L	0.0625		115	85-115			
Cadmium	0.0655	0.0010	mg/L	0.0625		105	85-115			
Chromium	0.0631	0.0020	mg/L	0.0625		101	85-115			
Cobalt	0.063	0.004	mg/L	0.0625		102	85-115			
Lead	0.065	0.002	mg/L	0.0625		103	85-115			
Lithium	0.07	0.02	mg/L	0.0625		114	85-115			
Selenium	0.064	0.003	mg/L	0.0625		102	85-115			
Thallium	0.0655	0.0020	mg/L	0.0625		105	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016507 - EPA 200.2										
Matrix Spike (B016507-MS1)	**Source: 0042891-01**									
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 12:16										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	49.1	40.0	mg/L	6.25	45.7	54.4	80-120			D2, M2
Matrix Spike (B016507-MS2)	**Source: 0042891-01**									
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 18:59										
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	100	80-120			
Mercury	0.0026	0.0005	mg/L	0.00250	ND	104	80-120			
Antimony	0.068	0.005	mg/L	0.0625	ND	108	80-120			
Arsenic	0.0646	0.0010	mg/L	0.0625	0.0025	99.3	80-120			
Barium	0.153	0.004	mg/L	0.0625	0.087	106	80-120			
Beryllium	0.0677	0.0020	mg/L	0.0625	ND	108	80-120			
Cadmium	0.0622	0.0010	mg/L	0.0625	ND	99.6	80-120			
Chromium	0.0620	0.0020	mg/L	0.0625	ND	99.2	80-120			
Cobalt	0.062	0.004	mg/L	0.0625	ND	99.4	80-120			
Lead	0.062	0.002	mg/L	0.0625	ND	99.0	80-120			
Lithium	0.08	0.02	mg/L	0.0625	0.007	111	80-120			
Selenium	0.060	0.003	mg/L	0.0625	ND	95.6	80-120			
Thallium	0.0629	0.0020	mg/L	0.0625	ND	101	80-120			
Matrix Spike Dup (B016507-MSD1)	**Source: 0042891-01**									
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 12:19										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	51.1	40.0	mg/L	6.25	45.7	86.5	80-120	4.00	20	D2
Matrix Spike Dup (B016507-MSD2)	**Source: 0042891-01**									
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 19:02										
Antimony	0.065	0.005	mg/L	0.0625	ND	104	80-120	3.93	20	
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	95.4	80-120	4.24	20	
Mercury	0.0026	0.0005	mg/L	0.00250	ND	104	80-120	0.266	20	
Arsenic	0.0626	0.0010	mg/L	0.0625	0.0025	96.2	80-120	3.12	20	
Barium	0.149	0.004	mg/L	0.0625	0.087	99.1	80-120	2.72	20	
Beryllium	0.0637	0.0020	mg/L	0.0625	ND	102	80-120	6.09	20	
Cadmium	0.0598	0.0010	mg/L	0.0625	ND	95.7	80-120	4.03	20	
Chromium	0.0592	0.0020	mg/L	0.0625	ND	94.7	80-120	4.66	20	
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.9	80-120	4.67	20	
Lead	0.059	0.002	mg/L	0.0625	ND	94.6	80-120	4.52	20	
Lithium	0.07	0.02	mg/L	0.0625	0.007	102	80-120	8.15	20	
Selenium	0.058	0.003	mg/L	0.0625	ND	93.4	80-120	2.35	20	
Thallium	0.0606	0.0020	mg/L	0.0625	ND	96.9	80-120	3.74	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016507 - EPA 200.2										
Post Spike (B016507-PS1) **Source: 0042891-01**										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 12:32										
Boron	441		ug/L	125	340	80.7	75-125			D2
Calcium	52000		ug/L	6250	45700	99.8	75-125			D2
Post Spike (B016507-PS2) **Source: 0042891-01**										
Prepared: 4/20/2020 7:50, Analyzed: 4/24/2020 19:06										
Molybdenum	69.0		ug/L	62.5	6.12	101	75-125			
Mercury	2.64		ug/L	2.50	0.0359	104	75-125			
Antimony	68.7		ug/L	62.5	-0.224	110	75-125			
Arsenic	67.0		ug/L	62.5	2.50	103	75-125			
Barium	156		ug/L	62.5	87.4	109	75-125			
Beryllium	68.8		ug/L	62.5	0.0133	110	75-125			
Cadmium	63.7		ug/L	62.5	0.0061	102	75-125			
Chromium	63.0		ug/L	62.5	0.201	100	75-125			
Cobalt	63.6		ug/L	62.5	0.773	100	75-125			
Lead	63.0		ug/L	62.5	0.008	101	75-115			
Lithium	76.5		ug/L	62.5	7.31	111	75-125			
Selenium	61.3		ug/L	62.5	0.090	98.0	75-125			
Thallium	64.3		ug/L	62.5	0.0559	103	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B016533 - Default Prep Wet Chem										
Blank (B016533-BLK1)										
Prepared: 4/17/2020 10:54, Analyzed: 4/18/2020 14:57										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B016533-BS1)										
Prepared: 4/17/2020 10:58, Analyzed: 4/18/2020 14:57										
Total Dissolved Solids	1420	25	mg/L	1500		94.4	80-120			
Duplicate (B016533-DUP1) **Source: 0040832-01**										
Prepared: 4/17/2020 12:22, Analyzed: 4/18/2020 14:57										
Total Dissolved Solids	116	50	mg/L		106			9.01	10	
Duplicate (B016533-DUP2) **Source: 0043185-01**										
Prepared: 4/17/2020 12:26, Analyzed: 4/18/2020 14:57										
Total Dissolved Solids	336	50	mg/L		332			1.20	10	
Batch B017077 - Default Prep Wet Chem										
LCS (B017077-BS1)										
Prepared: 4/20/2020 14:20, Analyzed: 4/20/2020 14:20										
pH (Lab)	8.00		Std. Units	8.00		100	98.8-101.2			
LCS (B017077-BS2)										
Prepared: 4/20/2020 14:35, Analyzed: 4/20/2020 14:35										
pH (Lab)	8.09		Std. Units	8.00		101	98.8-101.2			
Duplicate (B017077-DUP1) **Source: 0042891-06**										
Prepared: 4/20/2020 14:33, Analyzed: 4/20/2020 14:33										
pH (Lab)	6.04	0.10	Std. Units		6.05			0.165	10	
Duplicate (B017077-DUP2) **Source: 0043328-01**										
Prepared: 4/20/2020 14:48, Analyzed: 4/20/2020 14:48										
pH (Lab)	8.16	0.10	Std. Units		8.16			0.00	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B018032 - Default Prep IC										
Blank (B018032-BLK1)										
Prepared: 4/27/2020 10:44, Analyzed: 4/27/2020 10:44										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B018032-BS1)										
Prepared: 4/27/2020 10:24, Analyzed: 4/27/2020 10:24										
Chloride	9.4		mg/L	10.0		93.5	90-110			
Fluoride	9.3		mg/L	10.0		93.2	90-110			
Sulfate	9		mg/L	10.0		92.4	90-110			
Matrix Spike (B018032-MS1) **Source: 0042891-06**										
Prepared: 4/27/2020 16:51, Analyzed: 4/27/2020 16:51										
Chloride	10.2		mg/L	10.0	0.0	102	75-125			
Fluoride	10.2		mg/L	10.0	0.06	102	75-125			
Sulfate	10		mg/L	10.0	0.005	102	75-125			
Matrix Spike Dup (B018032-MSD1) **Source: 0042891-06**										
Prepared: 4/27/2020 17:11, Analyzed: 4/27/2020 17:11										
Fluoride	10.5		mg/L	10.0	0.06	104	75-125	2.11	15	
Chloride	10.4		mg/L	10.0	0.0	104	75-125	2.36	15	
Sulfate	10		mg/L	10.0	0.005	104	75-125	1.10	15	

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

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Sample Acceptance Checklist for Work Order 0042891

Shipped By: Client

Temperature: 2.10° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature):

required information

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No

*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) ____

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-01 A	4/16/20	0915	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ✓				
0042891-01 B	4/16/20	0915	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ✓				
0042891-01 C	4/16/20	0915	Plastic 1L	1	MW7	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-01 D	4/16/20	0915	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AM 2.1

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 0915

pH 6.86 Cond ~~(umho)~~ mS/cm 0.428 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 13.38 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)
	Mary Yeager	4/16/20	1453

☐ PACE- Check here if trip charge applied to associated COC

Printed: 4/10/2020 3:16:55PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): D. Mott

required information

Compliance Monitoring? Yes X 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) ____

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-01 E	4/16/20	0915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW7	g / c	Radium 228 (sub)
0042891-01 F	4/16/20	0915	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW7	g / c	Radium 228 (sub)
0042891-02 A	4/16/20	1050	Plastic 500mL pH<2 w/HNO3 Preservation Check: pH : ✓	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 0915

pH 6.86 Cond ~~(umho)~~ 0.428 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 13.38 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)
D. Mott	Mary Yeary	4/16/20	1453

☐ PACE- Check here if trip charge applied to associated COC

Printed: 4/10/2020 3:16:55PM

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

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Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No

Samples Chlorinated? Yes No

*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) ____

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-02 B	4/16/20	1050	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : √				
0042891-02 C	4/16/20	1050	Plastic 1L	1	MW8	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-02 D	4/16/20	1050	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
			Preservation Check: pH : √				
0042891-02 E	4/16/20	1050	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : √				
0042891-02 F	4/16/20	1050	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : √				

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1050

pH 6.78 Cond ~~(umho)~~ 2.66 Res Cl (mg/L) ____ Tot Cl (mg/L) ____ Free Cl (mg/L) ____

Temp (oC) 14.38 or (oF) ____ Static Water Level ____ DO (mg/L) ____ Turb. (NTU) ____

Flow (MGD) ____ or (CFS) ____ or (g/min) ____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/16/20	1453

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Printed: 4/10/2020 3:16:55PM

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P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

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Chad Phillips
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PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mayo
required information

Compliance Monitoring? Yes X 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) ___

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-03 A	4/16/20	1215	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : N				
0042891-03 B	4/16/20	1215	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ✓				
0042891-03 C	4/16/20	1215	Plastic 1L	1	MW9	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-03 D	4/16/20	1215	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW9	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AW

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1215

pH 7.04 Cond ~~(umho)~~ 0.594 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 16.41 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mayo	Mark Yates	4/16/20	1453

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Printed: 4/10/2020 3:16:55PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) _____

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-03 E	4/16/20	1215	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW9	g / c	Radium 228 (sub)
0042891-03 F	4/16/20	1215	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH : ✓	1	MW9	g / c	Radium 228 (sub)
0042891-04 A	4/16/20	1325	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020

Preservation Check: pH : ✓

Preservation Check Performed by: AM

Field data collected by: Philip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1215

pH 7.04 Cond ~~(umho)~~ 0.594 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 16.41 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/16/20	1453

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PWS ID#:
State: KY

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) _____

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-04 B	4/16/20	1325	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : √				
0042891-04 C	4/16/20	1325	Plastic 1L	1	MW10	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-04 D	4/16/20	1325	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)
			Preservation Check: pH : √				
0042891-04 E	4/16/20	1325	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : √				
0042891-04 F	4/16/20	1325	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : √				

Preservation Check Performed by: AU

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1325

pH 8.87 Cond ~~(umho)~~ 0.810 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 17.13 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/16/20	1453

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) ___

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-05 A	4/16/20	1115	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : √				
0042891-05 B	4/16/20	1115	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : √				
0042891-05 C	4/16/20	1115	Plastic 1L	1	DUPLICATE	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-05 D	4/16/20	1115	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH : √				

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1115

pH 6.78 Cond ~~(umho)~~ 2.66 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 14.38 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/16/20	1453

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): R. Mott

required information

Compliance Monitoring? Yes X 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) ___

MMLI USE ONLY **Workorder # 0042891**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-05 E	4/16/20	1115	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	Radium 228 (sub)
0042891-05 F	4/16/20	1115	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ✓	1	DUPLICATE	g / c	Radium 228 (sub)
0042891-06 A	4/16/20	1345	Plastic 500mL pH<2 w/HNO3 **Preservation Check: pH :** ✓	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020

Preservation Check Performed by: AW

Field data collected by: Phillip Date (mm/dd/yy) 4/16/20 Time (24 hr) 1115

pH 6.78 Cond ~~(umho)~~ 2.66 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 14.38 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)
R. Mott		4/16/20	1453

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Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/10/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) ___

MMLI USE ONLY Workorder # 0042891 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0042891-06 B	4/16/20	1345	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ✓				
0042891-06 C	4/16/20	1345	Plastic 1L	1	FIELD BLANK	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0042891-06 D	4/16/20	1345	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0042891-06 E	4/16/20	1345	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0042891-06 F	4/16/20	1345	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: AM

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/16/20 Time (24 hr) 1345

pH ___ Cond (umho) ___ Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) ___ or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		4/16/20	1453

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Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 12, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30359743001	**0042891-01**	Water	04/16/20 09:15	04/21/20 09:30
30359743002	**0042891-02**	Water	04/16/20 10:50	04/21/20 09:30
30359743003	**0042891-03**	Water	04/16/20 12:15	04/21/20 09:30
30359743004	**0042891-04**	Water	04/16/20 13:25	04/21/20 09:30
30359743005	**0042891-05**	Water	04/16/20 11:15	04/21/20 09:30
30359743006	**0042891-06**	Water	04/16/20 13:45	04/21/20 09:30

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30359743001	**0042891-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30359743002	**0042891-02**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30359743003	**0042891-03**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30359743004	**0042891-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30359743005	**0042891-05**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30359743006	**0042891-06**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Sample: 0042891-01 **Lab ID: 30359743001** Collected: 04/16/20 09:15 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.613 ± 0.486 (0.660) C:NA T:90%**	pCi/L	05/11/20 14:21	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.22 ± 0.493 (0.780) C:81% T:80%**	pCi/L	05/07/20 14:09	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.83 ± 0.979 (1.44)**	pCi/L	05/12/20 08:52	7440-14-4	

Sample: 0042891-02 **Lab ID: 30359743002** Collected: 04/16/20 10:50 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.490 ± 0.566 (0.920) C:NA T:89%**	pCi/L	05/11/20 14:21	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.44 ± 0.475 (0.605) C:77% T:84%**	pCi/L	05/07/20 14:11	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.93 ± 1.04 (1.53)**	pCi/L	05/12/20 08:52	7440-14-4	

Sample: 0042891-03 **Lab ID: 30359743003** Collected: 04/16/20 12:15 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**1.39 ± 0.717 (0.795) C:NA T:85%**	pCi/L	05/11/20 14:49	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.51 ± 0.468 (0.559) C:75% T:98%**	pCi/L	05/07/20 14:11	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**2.90 ± 1.19 (1.35)**	pCi/L	05/12/20 08:52	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

Sample: 0042891-04 **Lab ID: 30359743004** Collected: 04/16/20 13:25 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.598 ± 0.542 (0.799) C:NA T:83%**	pCi/L	05/11/20 14:49	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.643 ± 0.387 (0.717) C:77% T:88%**	pCi/L	05/07/20 14:11	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.24 ± 0.929 (1.52)**	pCi/L	05/12/20 08:52	7440-14-4	

Sample: 0042891-05 **Lab ID: 30359743005** Collected: 04/16/20 11:15 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.378 ± 0.430 (0.679) C:NA T:91%**	pCi/L	05/11/20 14:49	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.09 ± 0.430 (0.653) C:77% T:91%**	pCi/L	05/07/20 14:12	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**1.47 ± 0.860 (1.33)**	pCi/L	05/12/20 08:57	7440-14-4	

Sample: 0042891-06 **Lab ID: 30359743006** Collected: 04/16/20 13:45 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.109 ± 0.261 (0.504) C:NA T:98%**	pCi/L	05/11/20 14:49	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.718 ± 0.375 (0.641) C:76% T:84%**	pCi/L	05/07/20 14:12	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.827 ± 0.636 (1.15)**	pCi/L	05/12/20 08:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

QC Batch: 393303 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: 30359743001, 30359743002, 30359743003, 30359743004, 30359743005, 30359743006

METHOD BLANK: 1905202 Matrix: Water
Associated Lab Samples: 30359743001, 30359743002, 30359743003, 30359743004, 30359743005, 30359743006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.262 ± 0.244 (0.656) C:NA T:91%	pCi/L	05/11/20 14:21	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

QC Batch: 393304 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: 30359743001, 30359743002, 30359743003, 30359743004, 30359743005, 30359743006

METHOD BLANK: 1905203 Matrix: Water
Associated Lab Samples: 30359743001, 30359743002, 30359743003, 30359743004, 30359743005, 30359743006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.223 ± 0.355 (0.769) C:79% T:81%	pCi/L	05/07/20 14:09	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 42891 HMPL Surface Impoundme
Pace Project No.: 30359743

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.

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.

WO# : 30359743

30359743

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 42891 Workorder Name: HMPL Surface Impoundme Owner Received Date: 4/16/2020 Results Requested By:

Report To:	Subcontract To:
McCoy & McCoy Labs P.O. Box 907 Madisonville, KY 42409 270-821-7375 r.whittington@mccoylabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	0042891-01		04/16/20 09:15	IR44-McCoy	Water		X	X	001
3	0042891-02		04/16/20 10:50	IR44-McCoy	Water		X	X	002
4	0042891-03		04/16/20 12:15	IR44-McCoy	Water		X	X	003
5	0042891-04		04/16/20 13:25	IR44-McCoy	Water		X	X	004
6	0042891-05		04/16/20 11:15	IR44-McCoy	Water		X	X	005
7	0042891-06		04/16/20 13:45	IR44-McCoy	Water		X	X	006
8									
9									
10									

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			Nicole Russell	4/21/2020 930	
2					
3					

Cooler Temperature on Receipt 3.5 °C | **Custody Seal Y or N** | **Received on Ice Y or N** | **Sample Intact Y or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

#_30359743

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0042891

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:

Please return shipping cooler to return address on shipping label.

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0042891-01	**Water**	**Sampled:04/16/2020 09:15**	**Specific Method**	
Radium 228 (sub)		10/13/2020 09:15	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/13/2020 09:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/13/2020 09:15	EPA 903.1	
Sample ID: 0042891-02	**Water**	**Sampled:04/16/2020 10:50**	**Specific Method**	
Radium 226 (sub)		10/13/2020 10:50	EPA 903.1	
Radium 228 (sub)		10/13/2020 10:50	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/13/2020 10:50	EPA 904.0 Radium Sum C	
Sample ID: 0042891-03	**Water**	**Sampled:04/16/2020 12:15**	**Specific Method**	
Radium Total (sub)		10/13/2020 12:15	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/13/2020 12:15	EPA 903.1	
Radium 228 (sub)		10/13/2020 12:15	EPA 904.0 Radium Sum C	
Sample ID: 0042891-04	**Water**	**Sampled:04/16/2020 13:25**	**Specific Method**	
Radium 228 (sub)		10/13/2020 13:25	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/13/2020 13:25	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/13/2020 13:25	EPA 903.1	
Sample ID: 0042891-05	**Water**	**Sampled:04/16/2020 11:15**	**Specific Method**	
Radium 226 (sub)		10/13/2020 11:15	EPA 903.1	
Radium 228 (sub)		10/13/2020 11:15	EPA 904.0 Radium Sum C	
Radium Total (sub)		10/13/2020 11:15	EPA 904.0 Radium Sum C	
Sample ID: 0042891-06	**Water**	**Sampled:04/16/2020 13:45**	**Specific Method**	
Radium Total (sub)		10/13/2020 13:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/13/2020 13:45	EPA 903.1	
Radium 228 (sub)		10/13/2020 13:45	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	04-20-20		
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: McCoy & McCoy Project # # 30359743

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label NMR
LIMS Login NMR

Tracking #: 110733861557

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 3.9 °C Correction Factor: -0.4 °C Final Temp: 3.5 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D4191 / Date and initials of person examining contents: NMR 4/21/2020
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. no date + time on label
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH < 2
All containers meet method preservation requirements.	✓			Initial when completed NMR / Date/time of preservation / Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR / Date: 4/21/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
0043319

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 05/12/2020 13:16

Project Name:	HMPL Surface Impoundment	Workorder:	0043319

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 04/17/2020 15:05.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0043319-01	MW-110/	Groundwater	04/17/2020 12:10	04/17/2020 15:05	Phillip Hill

LabNumber	Measurement	Value
0043319-01	Field Conductance	1470
	Field pH	7.17
	Field Temp (C)	14.00

Pace Analytical Services, LLC
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Madisonville, KY 42431
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ANALYTICAL RESULTS

Lab Sample ID: **0043319-01**
Description: **MW-110**

Sample Collection Date Time: 04/17/2020 12:10
Sample Received Date Time: 04/17/2020 15:05

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Arsenic	**0.0012**		mg/L	0.0010	0.0004	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Barium	**0.065**		mg/L	0.004	0.001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Beryllium	ND	M2, U	mg/L	0.0020	0.0010	SW846-6020 A	04/21/2020 08:00	04/27/2020 11:24	DMH
Boron	**0.54**	M4	mg/L	0.10	0.10	SW846 6010 B	04/21/2020 08:00	04/24/2020 15:41	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Calcium	**181**	D1, M2	mg/L	40.0	13.0	SW846 6010 B	04/21/2020 08:00	04/24/2020 15:47	AKB
Chromium	**0.0047**		mg/L	0.0020	0.0006	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Lead	**0.002**		mg/L	0.002	0.0005	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Lithium	**0.02**		mg/L	0.02	0.005	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Mercury	**0.0002**	J	mg/L	0.0005	0.0002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	04/21/2020 08:00	04/26/2020 19:22	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.22**	H3	Std. Units	0.10	0.10	4500-H+ B-2000	04/20/2020 14:37	04/20/2020 14:37	GAT
Total Dissolved Solids	**1150**		mg/L	50	50	2540 C-2011	04/21/2020 10:52	04/22/2020 12:57	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.663**	_Sub	pCi/L			EPA 903.1	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium-228	**0.708**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW
Radium	**1.37**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	05/12/2020 10:37	05/12/2020 13:04	RCW

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**22.1**		mg/L	2.0	1.3	SW846 9056	04/28/2020 15:14	04/28/2020 15:14	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	04/28/2020 15:14	04/28/2020 15:14	CSC
Sulfate	**460**	D	mg/L	100	50	SW846 9056	04/28/2020 15:34	04/28/2020 15:34	CSC

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Notes for work order 0043319

- Samples collected by MMLI personnel are done so in accordance with procedures set forth in MMLI field services SOPs.
- Results contained in this report are only representative of the samples received.
- MMLI 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.
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 (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Pace Analytical Services, LLC
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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Blank (B017084-BLK1)										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 15:35										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Blank (B017084-BLK2)										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:14										
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
LCS (B017084-BS1)										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 15:38										
Boron	0.13	0.10	mg/L	0.125		102	85-115			
Calcium	6.37	0.40	mg/L	6.25		102	85-115			
LCS (B017084-BS2)										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:18										
Antimony	0.068	0.005	mg/L	0.0625		109	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		105	85-115			
Arsenic	0.0653	0.0010	mg/L	0.0625		104	85-115			
Barium	0.066	0.004	mg/L	0.0625		106	85-115			
Beryllium	0.0562	0.0020	mg/L	0.0625		89.9	85-115			
Cadmium	0.0646	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0662	0.0020	mg/L	0.0625		106	85-115			
Cobalt	0.066	0.004	mg/L	0.0625		106	85-115			
Lead	0.060	0.002	mg/L	0.0625		96.7	85-115			
Lithium	0.06	0.02	mg/L	0.0625		98.5	85-115			
Selenium	0.062	0.003	mg/L	0.0625		99.9	85-115			
Thallium	0.0618	0.0020	mg/L	0.0625		98.8	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Matrix Spike (B017084-MS1) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:09										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	180	40.0	mg/L	6.25	181	NR	80-120			D2, M2
Matrix Spike (B017084-MS2) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:29										
Antimony	0.057	0.005	mg/L	0.0625	ND	91.3	80-120			
Molybdenum	0.06	0.01	mg/L	0.0625	ND	95.1	80-120			
Mercury	0.0026	0.0005	mg/L	0.00250	0.0002	94.7	80-120			
Arsenic	0.0582	0.0010	mg/L	0.0625	0.0012	91.2	80-120			
Barium	0.120	0.004	mg/L	0.0625	0.065	89.1	80-120			
Beryllium	0.0459	0.0020	mg/L	0.0625	ND	73.4	80-120			M2
Cadmium	0.0534	0.0010	mg/L	0.0625	ND	85.4	80-120			
Chromium	0.0619	0.0020	mg/L	0.0625	0.0047	91.4	80-120			
Cobalt	0.059	0.004	mg/L	0.0625	ND	94.1	80-120			
Lead	0.053	0.002	mg/L	0.0625	0.002	81.8	80-120			
Lithium	0.07	0.02	mg/L	0.0625	0.02	81.5	80-120			
Selenium	0.051	0.003	mg/L	0.0625	ND	81.2	80-120			
Thallium	0.0529	0.0020	mg/L	0.0625	ND	84.6	80-120			
Matrix Spike Dup (B017084-MSD1) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:13										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	184	40.0	mg/L	6.25	181	51.8	80-120	2.05	20	D2, M2
Matrix Spike Dup (B017084-MSD2) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/26/2020 19:48										
Antimony	0.063	0.005	mg/L	0.0625	ND	101	80-120	9.71	20	
Molybdenum	0.06	0.01	mg/L	0.0625	ND	104	80-120	8.98	20	
Mercury	0.0026	0.0005	mg/L	0.00250	0.0002	94.7	80-120	0.0412	20	
Arsenic	0.0638	0.0010	mg/L	0.0625	0.0012	100	80-120	9.16	20	
Barium	0.126	0.004	mg/L	0.0625	0.065	99.0	80-120	5.02	20	
Beryllium	0.0505	0.0020	mg/L	0.0625	ND	80.8	80-120	9.61	20	
Cadmium	0.0591	0.0010	mg/L	0.0625	ND	94.6	80-120	10.2	20	
Chromium	0.0673	0.0020	mg/L	0.0625	0.0047	100	80-120	8.47	20	
Cobalt	0.065	0.004	mg/L	0.0625	ND	104	80-120	9.76	20	
Lead	0.058	0.002	mg/L	0.0625	0.002	90.6	80-120	9.98	20	
Lithium	0.08	0.02	mg/L	0.0625	0.02	91.4	80-120	8.62	20	
Selenium	0.055	0.003	mg/L	0.0625	ND	87.5	80-120	7.40	20	
Thallium	0.0582	0.0020	mg/L	0.0625	ND	93.1	80-120	9.62	20	

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017084 - EPA 200.2										
Post Spike (B017084-PS1) **Source: 0043319-01**										
Prepared: 4/21/2020 8:00, Analyzed: 4/24/2020 16:16										
Boron	649		ug/L	125	536	90.7	75-125			D2
Antimony	58.4		ug/L	62.5	0.081	93.3	75-125			
Molybdenum	64.4		ug/L	62.5	0.89	102	75-125			
Mercury	2.50		ug/L	2.50	0.212	91.5	75-125			
Calcium	183000		ug/L	6250	181000	32.4	75-125			D2, M2
Arsenic	63.5		ug/L	62.5	1.16	99.7	75-125			
Barium	126		ug/L	62.5	64.5	97.9	75-125			
Beryllium	50.1		ug/L	62.5	0.169	79.9	75-125			
Cadmium	58.2		ug/L	62.5	0.0110	93.1	75-125			
Chromium	67.0		ug/L	62.5	4.71	99.6	75-125			
Cobalt	63.8		ug/L	62.5	2.37	98.3	75-125			
Lead	57.6		ug/L	62.5	1.55	89.7	75-115			
Lithium	75.0		ug/L	62.5	18.1	91.1	75-125			
Selenium	54.1		ug/L	62.5	0.048	86.4	75-125			
Thallium	56.9		ug/L	62.5	0.0759	90.9	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B017077 - Default Prep Wet Chem										
LCS (B017077-BS1)										
Prepared: 4/20/2020 14:20, Analyzed: 4/20/2020 14:20										
pH (Lab)	8.00		Std. Units	8.00		100	98.8-101.2			
LCS (B017077-BS2)										
Prepared: 4/20/2020 14:35, Analyzed: 4/20/2020 14:35										
pH (Lab)	8.09		Std. Units	8.00		101	98.8-101.2			
Duplicate (B017077-DUP1) **Source: 0042891-06**										
Prepared: 4/20/2020 14:33, Analyzed: 4/20/2020 14:33										
pH (Lab)	6.04	0.10	Std. Units		6.05			0.165	10	
Duplicate (B017077-DUP2) **Source: 0043328-01**										
Prepared: 4/20/2020 14:48, Analyzed: 4/20/2020 14:48										
pH (Lab)	8.16	0.10	Std. Units		8.16			0.00	10	
Batch B017157 - Default Prep Wet Chem										
Blank (B017157-BLK1)										
Prepared: 4/21/2020 10:40, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B017157-BS1)										
Prepared: 4/21/2020 10:44, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	1420	25	mg/L	1500		94.3	80-120			
Duplicate (B017157-DUP1) **Source: 0043319-01**										
Prepared: 4/21/2020 11:04, Analyzed: 4/22/2020 12:57										
Total Dissolved Solids	1100	50	mg/L		1150			4.27	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B018057 - Default Prep IC										
Blank (B018057-BLK1)										
Prepared: 4/28/2020 10:29, Analyzed: 4/28/2020 10:29										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B018057-BS1)										
Prepared: 4/28/2020 10:08, Analyzed: 4/28/2020 10:08										
Chloride	9.6		mg/L	10.0		95.8	90-110			
Fluoride	9.5		mg/L	10.0		95.1	90-110			
Sulfate	10		mg/L	10.0		97.5	90-110			
Matrix Spike (B018057-MS1) **Source: 0043294-10**										
Prepared: 4/28/2020 13:52, Analyzed: 4/28/2020 13:52										
Chloride	409		mg/L	500	6.0	80.6	75-125			D
Fluoride	410		mg/L	500	5.6	80.9	75-125			D
Sulfate	2510		mg/L	500	1770	147	75-125			D, M1
Matrix Spike Dup (B018057-MSD1) **Source: 0043294-10**										
Prepared: 4/28/2020 14:13, Analyzed: 4/28/2020 14:13										
Chloride	432		mg/L	500	6.0	85.1	75-125	5.30	15	D
Fluoride	422		mg/L	500	5.6	83.3	75-125	2.93	15	D
Sulfate	2560		mg/L	500	1770	157	75-125	1.95	15	D, M1

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

Pace Analytical Services, LLC
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Madisonville, KY 42431
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Sample Acceptance Checklist for Work Order 0043319

Shipped By: Client

Temperature: 0.60° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes X No ___

Samples Chlorinated? Yes ___ No ___

*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) _____

MMLI USE ONLY **Workorder # 0041377**

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041377-07 A	4/17/20	1210	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ____				
0041377-07 B	4/17/20	1210	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 Antimony Tot 6020 Lead Tot 6020 Thallium Tot 6020 Lithium Tot 6020 Mercury Tot 6020 Molybdenum Tot 6020 Selenium Tot 6020
			Preservation Check: pH : ____				
0041377-07 C	4/17/20	1210	Plastic 1L	1	MW-110	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0041377-07 D	4/17/20	1210	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-110	g / c	Radium 226 (sub)
			Preservation Check: pH : ____				

0043319 Acl 041720

Preservation Check Performed by: _____

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/17/20 Time (24 hr) 1210

pH 7.17 Cond ~~(umho)~~ mS/cm 1.47 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 14.00 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mft	Abby Lawson	4/17/20	1505

☐ **PACE- Check here if trip charge applied to associated COC**

0.6

Printed: 3/25/2020 2:54:14PM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 04/01/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): M. Mft

required information

Compliance Monitoring? Yes X 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) ___

MMLI USE ONLY
Workorder # 0041377

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0041377-07 E	4/17/20	1210	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ___	1	MW-110	g / c	Radium 228 (sub)
0041377-07 F	4/17/20	1210	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) **Preservation Check: pH :** ___	1	MW-110	g / c	Radium 228 (sub)

0043319
Acl 041720

Preservation Check Performed by: ___

Field data collected by: Phillip Hill Date (mm/dd/yy) 4/17/20 Time (24 hr) 1210

pH 7.17 Cond (~~umho~~ mS/cm) 1.47 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 14.00 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
M. Mft	Abby Lauck	4/17/20	1505

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 3/25/2020 2:54:14PM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

May 12, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30359745001	**0043319-01**	Water	04/17/20 12:10	04/21/20 09:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30359745001	**0043319-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

Sample: 0043319-01 **Lab ID: 30359745001** Collected: 04/17/20 12:10 Received: 04/21/20 09:30 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.663 ± 0.781 (1.28) C:NA T:76%**	pCi/L	05/11/20 14:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.708 ± 0.403 (0.729) C:70% T:93%**	pCi/L	05/07/20 14:12	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.37 ± 1.18 (2.01)**	pCi/L	05/12/20 08:57	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Greensburg, PA 15601
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

QC Batch: 393303
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30359745001

METHOD BLANK: 1905202 Matrix: Water
Associated Lab Samples: 30359745001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.262 ± 0.244 (0.656) C:NA T:91%	pCi/L	05/11/20 14:21	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

QC Batch: 393304
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30359745001

METHOD BLANK: 1905203 Matrix: Water
Associated Lab Samples: 30359745001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.223 ± 0.355 (0.769) C:79% T:81%	pCi/L	05/07/20 14:09	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 43319 HMPL Surface Impoundme
Pace Project No.: 30359745

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.

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.

WO# : 30359745

30359745

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 43319 Workorder Name: HMPL Surface Impoundme Owner Received Date: 4/17/2020 Results Requested By:

Report To:	Subcontract To:
McCoy & McCoy Labs P.O. Box 907 Madisonville, KY 42409 270-821-7375 r.whittington@mccoylabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers	Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1									
2	0043319-01		04/17/20 12:10	IR44-McCoy	Water		X	X	01
3									
4									
5									
6									
7									
8									
9									
10									

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			Nicole Burns	4/21/2020 930	
2					
3					

Cooler Temperature on Receipt 3.5 °C | **Custody Seal Y or (N)** | **Received on Ice (Y) or N** | **Sample Intact (Y) or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

#_30359745

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0043319

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:

Please return shipping cooler to return address on shipping label.

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0043319-01	**Water**	**Sampled:04/17/2020 12:10**	**Specific Method**	
Radium Total (sub)		10/14/2020 12:10	EPA 904.0 Radium Sum C	
Radium 228 (sub)		10/14/2020 12:10	EPA 904.0 Radium Sum C	
Radium 226 (sub)		10/14/2020 12:10	EPA 903.1	

Mary Yaney 04-20-20

Released By	Date	Received By	Date
Released By	Date	Received By	Date

3035974

Sample Custody

By Nancy Yeager

Printed 04/20/2020 09:57

Lab ID	Container	Cooler	Last Own	Departme	Location	Home Locat	Status	Disposition	Custody Date
0042891-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-02	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-02	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-02	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-03	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-03	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-03	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-04	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-04	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-04	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-05	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-05	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-05	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-06	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-06	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0042891-06	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Batched	Active (Out)	04/20/2020 09:56
0043319-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56
0043319-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56
0043319-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56
0043320-01	Plastic 1L pH<2 w/HNO3 Rad 226 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56
0043320-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56
0043320-01	Plastic 1L pH<2 w/HNO3 Rad 228 (Safa	ult Coole	NDY		Wet Chem In-Transit		Received	Active (Out)	04/20/2020 09:56

Relinquished By — Date 04-20-20 — Received By — Date

Relinquished By — Date — Received By — Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: McCoy & McCoy Project # #_30359745

Label NMR
LIMS Login NMR

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Tracking #: 110733861557

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 3.9 °C Correction Factor: -0.4 °C Final Temp: 3.5 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4191 Date and Initials of person examining contents: NMR 4/21/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: NMR 4/21/2020	✓			5. no date & time on sample labels
-Includes date/time/ID Matrix: WT				
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation.	✓			16. pH<2
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				
All containers meet method preservation requirements.	✓			Initial when completed NMR Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 4/21/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Certificate of Analysis
0084065

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 10/30/2020 15:49

Project Name:	HMPL Surface Impoundment	Workorder:	0084065

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 09/24/2020 16:30.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

Rob Whittington, Project Manager

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Pace Analytical Services, LLC
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Madisonville, KY 42431
270.821.7375
www.pacelabs.com

SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0084065-01	MW7/	Groundwater	09/24/2020 11:35	09/24/2020 16:30	Phillip Hill
0084065-02	MW8/	Groundwater	09/24/2020 13:05	09/24/2020 16:30	Phillip Hill
0084065-03	MW9/	Groundwater	09/24/2020 13:45	09/24/2020 16:30	Phillip Hill
0084065-04	MW10/	Groundwater	09/24/2020 14:45	09/24/2020 16:30	Phillip Hill
0084065-05	DUPLICATE/	Groundwater	09/24/2020 13:58	09/24/2020 16:30	Phillip Hill
0084065-06	FIELD BLANK/	Water	09/24/2020 15:00	09/24/2020 16:30	Phillip Hill

LabNumber	Measurement	Value
0084065-01	Field Conductance	294
	Field pH	6.56
	Field Temp (C)	21.40
0084065-02	Field Conductance	1970
	Field pH	6.58
	Field Temp (C)	19.53
0084065-03	Field Conductance	415
	Field pH	6.67
	Field Temp (C)	19.52
0084065-04	Field Conductance	594
	Field pH	8.74
	Field Temp (C)	18.69
0084065-05	Field Conductance	415
	Field pH	6.67
	Field Temp (C)	19.52

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-01**
Description: **MW7**

Sample Collection Date Time: 09/24/2020 11:35
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	M2, U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Arsenic	**0.0015**	M2	mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Barium	**0.075**	M3	mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Boron	**0.33**	M2, M4	mg/L	0.10	0.10	SW846 6010 B	09/28/2020 09:12	10/30/2020 09:33	dmh
Cadmium	ND	M2, U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Calcium	**41.8**	D2, M1, M2	mg/L	4.00	1.30	SW846 6010 B	09/28/2020 09:12	09/29/2020 12:39	AKB
Chromium	ND	M2, U	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Cobalt	ND	M2, U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Lead	ND	M2, U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Lithium	**0.008**	J	mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	10/01/2020 11:06	CAM
Mercury	ND	M2, U	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Molybdenum	**0.006**	M2, J	mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Selenium	ND	M2, U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH
Thallium	ND	M2, U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:12	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.63**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:16	09/29/2020 14:16	CML
Total Dissolved Solids	**114**		mg/L	50	50	2540 C-2011	09/29/2020 15:40	09/30/2020 15:45	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.479**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**0.489**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	**0.968**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/16/2020 00:00	10/16/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**3.3**		mg/L	2.0	1.3	SW846 9056	09/26/2020 05:22	09/26/2020 05:22	KJL
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	09/26/2020 05:22	09/26/2020 05:22	KJL
Sulfate	**12**		mg/L	1	0.5	SW846 9056	09/26/2020 05:22	09/26/2020 05:22	KJL

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-02**
Description: **MW8**

Sample Collection Date Time: 09/24/2020 13:05
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Barium	**0.016**		mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Boron	**1.41**	D2	mg/L	1.00	1.00	SW846 6010 B	09/28/2020 09:12	09/29/2020 12:55	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Calcium	**257**	D1	mg/L	40.0	13.0	SW846 6010 B	09/28/2020 09:12	09/29/2020 12:58	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Lithium	**0.03**		mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	10/01/2020 11:13	CAM
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Molybdenum	**0.01**		mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:15	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.18**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:17	09/29/2020 14:17	CML
Total Dissolved Solids	**1940**		mg/L	50	50	2540 C-2011	09/29/2020 15:44	09/30/2020 15:45	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.366**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**-0.110**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	**0.366**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/16/2020 00:00	10/16/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**49.2**		mg/L	2.0	1.3	SW846 9056	09/26/2020 05:43	09/26/2020 05:43	KJL
Fluoride	**0.4**		mg/L	0.2	0.1	SW846 9056	09/26/2020 05:43	09/26/2020 05:43	KJL
Sulfate	**1400**	D	mg/L	100	50	SW846 9056	09/26/2020 06:27	09/26/2020 06:27	KJL

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-03**
Description: **MW9**

Sample Collection Date Time: 09/24/2020 13:45
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Barium	**0.730**		mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Boron	**0.22**		mg/L	0.10	0.10	SW846 6010 B	09/28/2020 09:12	10/30/2020 09:39	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Calcium	**65.3**	D2	mg/L	4.00	1.30	SW846 6010 B	09/28/2020 09:12	09/29/2020 13:01	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Lithium	**0.009**	J	mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:33	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.23**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:18	09/29/2020 14:18	CML
Total Dissolved Solids	**308**		mg/L	50	50	2540 C-2011	09/30/2020 13:22	10/01/2020 15:25	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**1.37**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**2.07**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	**3.44**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/16/2020 00:00	10/16/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**19.9**		mg/L	2.0	1.3	SW846 9056	09/26/2020 06:48	09/26/2020 06:48	KJL
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	09/26/2020 06:48	09/26/2020 06:48	KJL
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	09/26/2020 06:48	09/26/2020 06:48	KJL

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-04**
Description: **MW10**

Sample Collection Date Time: 09/24/2020 14:45
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Arsenic	**0.0019**		mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Barium	**0.084**		mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Boron	**0.51**		mg/L	0.10	0.10	SW846 6010 B	09/28/2020 09:12	10/30/2020 09:45	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Calcium	**8.80**	D2	mg/L	4.00	1.30	SW846 6010 B	09/28/2020 09:12	09/29/2020 13:08	AKB
Chromium	**0.0006**	J	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Lithium	**0.56**		mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Mercury	**0.0002**	J	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Molybdenum	**0.007**	J	mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:37	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**9.29**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:19	09/29/2020 14:19	CML
Total Dissolved Solids	**436**		mg/L	50	50	2540 C-2011	09/30/2020 13:26	10/01/2020 15:25	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.325**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**0.269**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	**0.594**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/16/2020 00:00	10/16/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**21.4**		mg/L	2.0	1.3	SW846 9056	09/26/2020 07:10	09/26/2020 07:10	KJL
Fluoride	**0.5**		mg/L	0.2	0.1	SW846 9056	09/26/2020 07:10	09/26/2020 07:10	KJL
Sulfate	**62**	D	mg/L	20	10	SW846 9056	09/26/2020 07:31	09/26/2020 07:31	KJL

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-05**
Description: **DUPLICATE**

Sample Collection Date Time: 09/24/2020 13:58
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Barium	**0.753**		mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Boron	**0.22**		mg/L	0.10	0.10	SW846 6010 B	09/28/2020 09:12	10/30/2020 09:52	dmh
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Calcium	**66.0**	D2	mg/L	4.00	1.30	SW846 6010 B	09/28/2020 09:12	09/29/2020 13:14	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Lithium	**0.01**	J	mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:40	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**8.10**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:20	09/29/2020 14:20	CML
Total Dissolved Solids	**310**		mg/L	50	50	2540 C-2011	09/30/2020 13:30	10/01/2020 15:25	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**1.49**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**1.62**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	**3.11**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/19/2020 00:00	10/19/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**20.3**		mg/L	2.0	1.3	SW846 9056	09/26/2020 07:53	09/26/2020 07:53	KJL
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	09/26/2020 07:53	09/26/2020 07:53	KJL
Sulfate	ND	U	mg/L	1	0.5	SW846 9056	09/26/2020 07:53	09/26/2020 07:53	KJL

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ANALYTICAL RESULTS

Lab Sample ID: **0084065-06**
Description: **FIELD BLANK**

Sample Collection Date Time: 09/24/2020 15:00
Sample Received Date Time: 09/24/2020 16:30

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	U	mg/L	0.005	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Arsenic	ND	U	mg/L	0.0010	0.0004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Barium	ND	U	mg/L	0.004	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Beryllium	ND	U	mg/L	0.0020	0.0010	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Boron	ND	U	mg/L	0.10	0.10	SW846 6010 B	09/28/2020 09:12	09/29/2020 13:30	AKB
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Calcium	ND	U	mg/L	0.40	0.13	SW846 6010 B	09/28/2020 09:12	09/29/2020 13:30	AKB
Chromium	ND	U	mg/L	0.0020	0.0006	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Cobalt	ND	U	mg/L	0.004	0.004	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Lead	ND	U	mg/L	0.002	0.0005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Lithium	ND	U	mg/L	0.02	0.005	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Mercury	ND	U	mg/L	0.0005	0.0002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Molybdenum	ND	U	mg/L	0.01	0.002	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Selenium	ND	U	mg/L	0.003	0.001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	09/28/2020 09:12	09/30/2020 19:44	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.50**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	09/29/2020 14:21	09/29/2020 14:21	CML
Total Dissolved Solids	**200**		mg/L	50	50	2540 C-2011	09/30/2020 13:34	10/01/2020 15:25	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**-0.212**	_Sub	pCi/L			EPA 903.1	10/14/2020 00:00	10/14/2020 00:00	xxx
Radium-228	**-0.412**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/13/2020 00:00	10/13/2020 00:00	xxx
Radium	0.00	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/19/2020 00:00	10/19/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	U	mg/L	2.0	1.3	SW846 9056	09/26/2020 08:36	09/26/2020 08:36	KJL
Fluoride	ND	M1, U	mg/L	0.2	0.1	SW846 9056	09/26/2020 08:36	09/26/2020 08:36	KJL
Sulfate	ND	M1, U	mg/L	1	0.5	SW846 9056	09/26/2020 08:36	09/26/2020 08:36	KJL

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Notes for work order 0084065

- 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
H1	Sample analysis performed 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.
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 (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/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Results relate only to the items tested.

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039526 - EPA 200.2										
Blank (B039526-BLK1)										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 12:33										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Blank (B039526-BLK2)										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 19:04										
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	ND	0.0020	mg/L							U
LCS (B039526-BS1)										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 12:36										
Boron	0.13	0.10	mg/L	0.125		103	85-115			
Calcium	6.60	0.40	mg/L	6.25		106	85-115			
LCS (B039526-BS2)										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 19:08										
Antimony	0.067	0.005	mg/L	0.0625		107	85-115			
Mercury	0.0026	0.0005	mg/L	0.00250		105	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		107	85-115			
Arsenic	0.0660	0.0010	mg/L	0.0625		106	85-115			
Barium	0.066	0.004	mg/L	0.0625		105	85-115			
Beryllium	0.0681	0.0020	mg/L	0.0625		109	85-115			
Cadmium	0.0641	0.0010	mg/L	0.0625		103	85-115			
Chromium	0.0666	0.0020	mg/L	0.0625		107	85-115			
Cobalt	0.065	0.004	mg/L	0.0625		104	85-115			
Lead	0.063	0.002	mg/L	0.0625		101	85-115			
Lithium	0.07	0.02	mg/L	0.0625		109	85-115			
Selenium	0.067	0.003	mg/L	0.0625		107	85-115			
Thallium	0.0645	0.0020	mg/L	0.0625		103	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039526 - EPA 200.2										
Matrix Spike (B039526-MS1) **Source: 0084065-01**										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 14:27										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	49.3	40.0	mg/L	6.25	41.8	121	80-120			D2, M1
Matrix Spike (B039526-MS2) **Source: 0093514-03**										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 14:33										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	79.8	40.0	mg/L	6.25	72.7	113	80-120			D2
Matrix Spike (B039526-MS3) **Source: 0084065-01**										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 20:41										
Antimony	0.068	0.005	mg/L	0.0625	ND	108	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	0.006	105	80-120			Y2
Mercury	0.0025	0.0005	mg/L	0.00250	ND	98.7	80-120			
Arsenic	0.0684	0.0010	mg/L	0.0625	0.0015	107	80-120			Y2
Barium	0.146	0.004	mg/L	0.0625	0.075	114	80-120			
Beryllium	0.0660	0.0020	mg/L	0.0625	ND	106	80-120			Y2
Cadmium	0.0630	0.0010	mg/L	0.0625	ND	101	80-120			
Chromium	0.0689	0.0020	mg/L	0.0625	ND	110	80-120			Y2
Cobalt	0.066	0.004	mg/L	0.0625	ND	106	80-120			Y2
Lead	0.061	0.002	mg/L	0.0625	ND	97.5	80-120			
Lithium	0.08	0.02	mg/L	0.0625	0.008	113	80-120			Y2
Selenium	0.054	0.003	mg/L	0.0625	ND	87.1	80-120			Y2
Thallium	0.0618	0.0020	mg/L	0.0625	ND	98.9	80-120			Y2
Matrix Spike (B039526-MS4) **Source: 0093514-03**										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 20:48										
Mercury	0.0024	0.0005	mg/L	0.00250	ND	96.1	80-120			
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120			Y2
Antimony	0.067	0.005	mg/L	0.0625	ND	107	80-120			
Arsenic	0.0662	0.0010	mg/L	0.0625	0.0005	105	80-120			Y2
Barium	1.16	0.004	mg/L	0.0625	1.06	165	80-120			M3, E
Beryllium	0.0628	0.0020	mg/L	0.0625	ND	101	80-120			Y2
Cadmium	0.0616	0.0010	mg/L	0.0625	ND	98.5	80-120			
Chromium	0.0679	0.0020	mg/L	0.0625	0.0006	108	80-120			Y2
Cobalt	0.066	0.004	mg/L	0.0625	ND	106	80-120			Y2
Lead	0.060	0.002	mg/L	0.0625	ND	95.6	80-120			
Lithium	0.08	0.02	mg/L	0.0625	0.01	107	80-120			Y2
Selenium	0.061	0.003	mg/L	0.0625	ND	97.0	80-120			Y2
Thallium	0.0612	0.0020	mg/L	0.0625	ND	98.0	80-120			Y2

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039526 - EPA 200.2										
Matrix Spike Dup (B039526-MSD1) **Source: 0084065-01**										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 14:30										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	42.3	40.0	mg/L	6.25	41.8	7.55	80-120	15.4	20	D2, M2
Matrix Spike Dup (B039526-MSD2) **Source: 0093514-03**										
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 14:46										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	82.1	40.0	mg/L	6.25	72.7	150	80-120	2.84	20	D2, M1
Matrix Spike Dup (B039526-MSD3) **Source: 0084065-01**										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 20:44										
Antimony	ND	0.005	mg/L	0.0625	ND		80-120		20	M2, U
Molybdenum	0.006	0.01	mg/L	0.0625	0.006	0.148	80-120	171	20	M2, Y2, J
Mercury	ND	0.0005	mg/L	0.00250	ND		80-120		20	M2, U
Arsenic	0.0015	0.0010	mg/L	0.0625	0.0015	NR	80-120	191	20	M2, Y2
Barium	0.078	0.004	mg/L	0.0625	0.075	4.93	80-120	61.0	20	M3, Y2
Beryllium	ND	0.0020	mg/L	0.0625	ND		80-120		20	M2, Y2, U
Cadmium	ND	0.0010	mg/L	0.0625	ND		80-120		20	M2, U
Chromium	ND	0.0020	mg/L	0.0625	ND		80-120		20	M2, Y2, U
Cobalt	ND	0.004	mg/L	0.0625	ND		80-120		20	M2, Y2, U
Lead	ND	0.002	mg/L	0.0625	ND		80-120		20	M2, U
Lithium	0.008	0.02	mg/L	0.0625	0.008	0.989	80-120	162	20	M2, Y2, J
Selenium	ND	0.003	mg/L	0.0625	ND		80-120		20	M2, Y2, U
Thallium	ND	0.0020	mg/L	0.0625	ND		80-120		20	M2, Y2, U
Matrix Spike Dup (B039526-MSD4) **Source: 0093514-03**										
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 21:06										
Mercury	0.0024	0.0005	mg/L	0.00250	ND	96.0	80-120	0.159	20	
Antimony	0.066	0.005	mg/L	0.0625	ND	106	80-120	0.292	20	
Molybdenum	0.07	0.01	mg/L	0.0625	ND	104	80-120	0.0302	20	
Arsenic	0.0646	0.0010	mg/L	0.0625	0.0005	103	80-120	2.36	20	
Barium	1.16	0.004	mg/L	0.0625	1.06	159	80-120	0.348	20	M3, E
Beryllium	0.0620	0.0020	mg/L	0.0625	ND	99.1	80-120	1.38	20	
Cadmium	0.0609	0.0010	mg/L	0.0625	ND	97.4	80-120	1.07	20	
Chromium	0.0668	0.0020	mg/L	0.0625	0.0006	106	80-120	1.54	20	
Cobalt	0.066	0.004	mg/L	0.0625	ND	105	80-120	0.541	20	
Lead	0.060	0.002	mg/L	0.0625	ND	96.1	80-120	0.582	20	
Lithium	0.08	0.02	mg/L	0.0625	0.01	106	80-120	0.761	20	
Selenium	0.058	0.003	mg/L	0.0625	ND	93.5	80-120	3.63	20	
Thallium	0.0614	0.0020	mg/L	0.0625	ND	98.2	80-120	0.263	20	

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039526 - EPA 200.2										
Post Spike (B039526-PS1)	**Source: 0084065-01**									
Prepared: 9/28/2020 9:12, Analyzed: 9/29/2020 14:49										
Boron	392		ug/L	125	329	50.3	75-125			D2, M2
Calcium	46900		ug/L	6250	41800	81.3	75-125			D2
Post Spike (B039526-PS2)	**Source: 0084065-01**									
Prepared: 9/28/2020 9:12, Analyzed: 9/30/2020 21:09										
Mercury	2.38		ug/L	2.50	0.0269	94.0	75-125			
Antimony	63.9		ug/L	62.5	0.155	102	75-125			
Molybdenum	70.8		ug/L	62.5	5.53	104	75-125			
Arsenic	64.6		ug/L	62.5	1.54	101	75-125			
Barium	142		ug/L	62.5	74.8	107	75-125			
Beryllium	61.3		ug/L	62.5	0.0114	98.1	75-125			
Cadmium	60.6		ug/L	62.5	0.0110	97.0	75-125			
Chromium	66.4		ug/L	62.5	0.320	106	75-125			
Cobalt	63.8		ug/L	62.5	0.200	102	75-125			
Lead	60.3		ug/L	62.5	0.010	96.4	75-115			
Lithium	74.2		ug/L	62.5	7.61	106	75-125			
Selenium	58.1		ug/L	62.5	0.017	92.9	75-125			
Thallium	61.4		ug/L	62.5	0.0725	98.2	75-125			

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040197 - Default Prep Wet Chem										
LCS (B040197-BS1)										
Prepared: 9/29/2020 14:15, Analyzed: 9/29/2020 14:15										
pH (Lab)	8.02		Std. Units	8.00		100	98.8-101.2			
LCS (B040197-BS2)										
Prepared: 9/29/2020 14:28, Analyzed: 9/29/2020 14:28										
pH (Lab)	8.00		Std. Units	8.00		100	98.8-101.2			
Duplicate (B040197-DUP1) **Source: 0084067-04**										
Prepared: 9/29/2020 14:26, Analyzed: 9/29/2020 14:26										
pH (Lab)	6.95	0.10	Std. Units		6.94			0.144	10	
Duplicate (B040197-DUP2) **Source: 0093815-01**										
Prepared: 9/29/2020 14:41, Analyzed: 9/29/2020 14:41										
pH (Lab)	7.48	0.10	Std. Units		7.45			0.402	10	
Batch B040217 - Default Prep Wet Chem										
Blank (B040217-BLK1)										
Prepared: 9/29/2020 15:32, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B040217-BS1)										
Prepared: 9/29/2020 15:36, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	1310	25	mg/L	1500		87.6	80-120			
Duplicate (B040217-DUP1) **Source: 0084065-01**										
Prepared: 9/29/2020 17:00, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	118	50	mg/L		114			3.45	10	
Duplicate (B040217-DUP2) **Source: 0093702-01**										
Prepared: 9/29/2020 17:04, Analyzed: 9/30/2020 15:45										
Total Dissolved Solids	352	50	mg/L		354			0.567	10	
Batch B040276 - Default Prep Wet Chem										
Blank (B040276-BLK1)										
Prepared: 9/30/2020 13:14, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	ND	25	mg/L							U

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040276 - Default Prep Wet Chem										
LCS (B040276-BS1)										
Prepared: 9/30/2020 13:18, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	1430	25	mg/L	1500		95.2	80-120			
Duplicate (B040276-DUP1)	**Source: 0084065-03**									
Prepared: 9/30/2020 14:42, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	316	50	mg/L		308			2.56	10	
Duplicate (B040276-DUP2)	**Source: 0093656-01**									
Prepared: 9/30/2020 14:46, Analyzed: 10/1/2020 15:25										
Total Dissolved Solids	8930	50	mg/L		8980			0.580	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B039555 - Default Prep IC										
Blank (B039555-BLK1)										
Prepared: 9/26/2020 5:00, Analyzed: 9/26/2020 5:00										
Fluoride	0.1	0.2	mg/L							J
Chloride	ND	2.0	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B039555-BS1)										
Prepared: 9/26/2020 4:39, Analyzed: 9/26/2020 4:39										
Fluoride	10.0		mg/L	10.0		99.7	90-110			
Chloride	10.0		mg/L	10.0		99.8	90-110			
Sulfate	10		mg/L	10.0		102	90-110			
Matrix Spike (B039555-MS1) **Source: 0084065-06**										
Prepared: 9/26/2020 9:40, Analyzed: 9/26/2020 9:40										
Chloride	12.5		mg/L	10.0	0.08	125	75-125			
Fluoride	12.8		mg/L	10.0	0.07	127	75-125			M1
Sulfate	13		mg/L	10.0	0.1	132	75-125			M1
Matrix Spike Dup (B039555-MSD1) **Source: 0084065-06**										
Prepared: 9/26/2020 10:02, Analyzed: 9/26/2020 10:02										
Chloride	11.5		mg/L	10.0	0.08	115	75-125	8.41	15	
Fluoride	11.7		mg/L	10.0	0.07	116	75-125	8.89	15	
Sulfate	12		mg/L	10.0	0.1	119	75-125	9.51	15	

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

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Sample Acceptance Checklist for Work Order 0084065

Shipped By: Client

Temperature: 3.20° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
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Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-01 A	9/24/20	1135	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 : ✓				
0084065-01 B	9/24/20	1135	Plastic 1L	1	MW7	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-01 C	9/24/20	1135	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084065-01 D	9/24/20	1135	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-01 E	9/24/20	1135	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW7	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: Noy

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1135

pH 6.56 Cond ~~(umho)~~ mS/cm 0.294 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 21.40 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)
	abby Lamb	9/24/20	1630

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3.2

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Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

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Report To:
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Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

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Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

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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 # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-01 F	9/24/20	1135	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW7	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084065-02 A	9/24/20	1305	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 : ✓				
0084065-02 B	9/24/20	1305	Plastic 1L	1	MW8	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-02 C	9/24/20	1305	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW8	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084065-02 D	9/24/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1305

pH 6.58 Cond ~~(umho)~~ mS/cm 1.97 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 19.53 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)
	Abby Lauer	9/24/20	1630

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Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

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Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

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Collected by (Signature): P. Mill
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 # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-02 E	9/24/20	1305	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW8	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-02 F	9/24/20	1305	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW8	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084065-03 A	9/24/20	1345	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 : ✓				
0084065-03 B	9/24/20	1345	Plastic 1L	1	MW9	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-03 C	9/24/20	1345	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW9	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1345

pH 6.67 Cond ~~(umho)~~ mS/cm 0.415 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 19.52 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
P. Mill	Abby Lacer	9/24/20	1630

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Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-03 D	9/24/20	1345	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-03 E	9/24/20	1345	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW9	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-03 F	9/24/20	1345	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW9	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084065-04 A	9/24/20	1445	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 : ✓				
0084065-04 B	9/24/20	1445	Plastic 1L	1	MW10	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056

Preservation Check Performed by: NOY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1345 MW9

pH 6.67 Cond ~~(umho)~~ mS/cm 0.415 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 19.52 or (oF) _____ Static Water Level _____ DO (mg/L) _____ Turb. (NTU) _____

Flow (MGD) _____ or (CFS) _____ or (g/min) _____

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
		9/24/20	1630

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Chain of Custody

Scheduled for: 08/26/2020

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Chad Phillips
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Henderson, KY 42419
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PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

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Collected by (Signature): D. Mayo

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 # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-04 C	9/24/20	1445	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW10	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084065-04 D	9/24/20	1445	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-04 E	9/24/20	1445	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW10	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-04 F	9/24/20	1445	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW10	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1445

pH 8.74 Cond ~~(umho)~~ mS/cm 0.594 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 18.69 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)
D. Mayo	[illegible]	9/24/20	1630

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Chain of Custody

Scheduled for: 08/26/2020

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Project: HMPL Surface Impoundment

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Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
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Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): N. Mill
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 # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-05 A	9/24/20	1358	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 : ✓				
0084065-05 B	9/24/20	1358	Plastic 1L	1	DUPLICATE	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-05 C	9/24/20	1358	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	DUPLICATE	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084065-05 D	9/24/20	1358	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-05 E	9/24/20	1358	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	DUPLICATE	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NOV

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1358

pH 6.67 Cond ~~(umho)~~ mS/cm 0.415 Res Cl (mg/L) ___ Tot Cl (mg/L) ___ Free Cl (mg/L) ___

Temp (oC) 19.52 or (oF) ___ Static Water Level ___ DO (mg/L) ___ Turb. (NTU) ___

Flow (MGD) ___ or (CFS) ___ or (g/min) ___

Relinquished by: (Signature)	Received by: (Signature)	Date (mm/dd/yy)	Time (24 hr)
N. Mill	Abby Lacy	9/24/20	1630

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:03:36AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-05 F	9/24/20	1358	Plastic 1L pH<2 w/HNO3 (Sub)	1	DUPLICATE	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				
0084065-06 A	9/24/20	1500	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 : ✓				
0084065-06 B	9/24/20	1500	Plastic 1L	1	FIELD BLANK	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-06 C	9/24/20	1500	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	FIELD BLANK	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				
0084065-06 D	9/24/20	1500	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NOY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1500

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)
		9/24/20	1630

☐ PACE- Check here if trip charge applied to associated COC

Printed: 8/26/2020 9:03:36AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419

Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419

PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-06 E	9/24/20	1300	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	FIELD BLANK	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-06 F	9/24/20	1500	Plastic 1L pH<2 w/HNO3 (Sub)	1	FIELD BLANK	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				

Preservation Check Performed by: NDY

Field data collected by: Phillip Hill Date (mm/dd/yy) 9/24/20 Time (24 hr) 1308

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)
		9/24/20	1630

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 8/26/2020 9:03:36AM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

October 19, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 84065
Pace Project No.: 30384693

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on September 29, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 84065
Pace Project No.: 30384693

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 84065
Pace Project No.: 30384693

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30384693001	**0084065-01**	Water	09/24/20 11:35	09/29/20 10:40
30384693002	**0084065-02**	Water	09/24/20 13:05	09/29/20 10:40
30384693003	**0084065-03**	Water	09/24/20 13:45	09/29/20 10:40
30384693004	**0084065-04**	Water	09/24/20 14:45	09/29/20 10:40
30384693005	**0084065-05**	Water	09/24/20 13:58	09/29/20 10:40
30384693006	**0084065-06**	Water	09/24/20 15:00	09/29/20 10:40

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 84065
Pace Project No.: 30384693

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30384693001	**0084065-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384693002	**0084065-02**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384693003	**0084065-03**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384693004	**0084065-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384693005	**0084065-05**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
30384693006	**0084065-06**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 84065
Pace Project No.: 30384693

Sample: 0084065-01 **Lab ID: 30384693001** Collected: 09/24/20 11:35 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.479 ± 0.553 (0.899) C:NA T:97%**	pCi/L	10/14/20 14:04	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.489 ± 0.771 (1.67) C:61% T:80%**	pCi/L	10/13/20 18:23	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.968 ± 1.32 (2.57)**	pCi/L	10/16/20 12:16	7440-14-4	

Sample: 0084065-02 **Lab ID: 30384693002** Collected: 09/24/20 13:05 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.366 ± 0.341 (0.449) C:NA T:90%**	pCi/L	10/14/20 14:04	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**-0.110 ± 0.761 (1.79) C:60% T:75%**	pCi/L	10/13/20 18:24	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.366 ± 1.10 (2.24)**	pCi/L	10/16/20 12:16	7440-14-4	

Sample: 0084065-03 **Lab ID: 30384693003** Collected: 09/24/20 13:45 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**1.37 ± 0.864 (1.19) C:NA T:82%**	pCi/L	10/14/20 14:04	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**2.07 ± 0.846 (1.36) C:65% T:86%**	pCi/L	10/13/20 18:24	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**3.44 ± 1.71 (2.55)**	pCi/L	10/16/20 12:16	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 84065
Pace Project No.: 30384693

Sample: 0084065-04 **Lab ID: 30384693004** Collected: 09/24/20 14:45 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.325 ± 0.385 (0.604) C:NA T:90%**	pCi/L	10/14/20 14:26	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.269 ± 0.739 (1.65) C:63% T:70%**	pCi/L	10/13/20 18:24	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.594 ± 1.12 (2.25)**	pCi/L	10/16/20 12:16	7440-14-4	

Sample: 0084065-05 **Lab ID: 30384693005** Collected: 09/24/20 13:58 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**1.49 ± 0.618 (0.421) C:NA T:97%**	pCi/L	10/14/20 14:26	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**1.62 ± 0.877 (1.61) C:63% T:81%**	pCi/L	10/13/20 18:24	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**3.11 ± 1.50 (2.03)**	pCi/L	10/19/20 11:01	7440-14-4	

Sample: 0084065-06 **Lab ID: 30384693006** Collected: 09/24/20 15:00 Received: 09/29/20 10:40 Matrix: Water
PWS: Site ID: Sample Type:
Comments: • Sample collection dates and times were not present on the sample containers.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**-0.212 ± 0.295 (0.748) C:NA T:104%**	pCi/L	10/14/20 14:26	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**-0.412 ± 0.520 (1.31) C:64% T:83%**	pCi/L	10/13/20 17:33	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.000 ± 0.815 (2.06)**	pCi/L	10/19/20 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 84065
Pace Project No.: 30384693

QC Batch: 416327 | 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: 30384693001, 30384693002, 30384693003, 30384693004, 30384693005, 30384693006

METHOD BLANK: 2012863 | Matrix: Water
Associated Lab Samples: 30384693001, 30384693002, 30384693003, 30384693004, 30384693005, 30384693006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.253 ± 0.385 (0.663) C:NA T:82%	pCi/L	10/14/20 13:51	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 84065
Pace Project No.: 30384693

QC Batch: 416328 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: 30384693001, 30384693002, 30384693003, 30384693004, 30384693005, 30384693006

METHOD BLANK: 2012864 Matrix: Water
Associated Lab Samples: 30384693001, 30384693002, 30384693003, 30384693004, 30384693005, 30384693006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.943 ± 0.449 (0.755) C:69% T:80%	pCi/L	10/13/20 14:59	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 84065
Pace Project No.: 30384693

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.

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.

WO# : 30384693

30384693

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 84065 Workorder Name: HMPL Surface Impoundme Owner Received Date: 9/24/2020 Results Requested By:

Report To:	Subcontract To:
McCoy & McCoy Labs P.O. Box 907 Madisonville, KY 42409 270-821-7375 rob.whittington@pacelabs.com	Pace Analytical Services LLC Greensburg PA 1638 Rosey Town Rd Suite 2,3,4 Greensburg, PA 15601 (724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: EPA 903.1	Requested Analysis: EPA 904.0 Radium Sum Calc	LAB USE ONLY
1					Ground								
2	0084065-01		09/24/20 11:35	IR44-McCoy	Water						X	X	001
3	0084065-02		09/24/20 13:05	IR44-McCoy	Water						X	X	002
4	0084065-03		09/24/20 13:45	IR44-McCoy	Water						X	X	003
5	0084065-04		09/24/20 14:45	IR44-McCoy	Water						X	X	004
6	0084065-05		09/24/20 13:58	IR44-McCoy	Water						X	X	005
7	0084065-06		09/24/20 15:00	IR44-McCoy	Water						X	X	006
8													
9													
10													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1			A Hock	9/29/20 10:40	
2					
3					

Cooler Temperature on Receipt 6.9 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky

0084065

#_30384693

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: 0084065-01	**Water**	**Sampled:09/24/2020 11:35**	**Specific Method**	
Radium 228 (sub)		03/23/2021 11:35	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/23/2021 11:35	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/23/2021 11:35	EPA 903.1	
Sample ID: 0084065-02	**Water**	**Sampled:09/24/2020 13:05**	**Specific Method**	
Radium 226 (sub)		03/23/2021 13:05	EPA 903.1	
Radium 228 (sub)		03/23/2021 13:05	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/23/2021 13:05	EPA 904.0 Radium Sum C	
Sample ID: 0084065-03	**Water**	**Sampled:09/24/2020 13:45**	**Specific Method**	
Radium Total (sub)		03/23/2021 13:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/23/2021 13:45	EPA 903.1	
Radium 228 (sub)		03/23/2021 13:45	EPA 904.0 Radium Sum C	
Sample ID: 0084065-04	**Water**	**Sampled:09/24/2020 14:45**	**Specific Method**	
Radium 228 (sub)		03/23/2021 14:45	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/23/2021 14:45	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/23/2021 14:45	EPA 903.1	
Sample ID: 0084065-05	**Water**	**Sampled:09/24/2020 13:58**	**Specific Method**	
Radium 226 (sub)		03/23/2021 13:58	EPA 903.1	
Radium 228 (sub)		03/23/2021 13:58	EPA 904.0 Radium Sum C	
Radium Total (sub)		03/23/2021 13:58	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
[signature]	09.28.20	[signature]	09/29/20 10:40
Released By	Date	Received By	Date

SUBCONTRACT ORDER

Pace Analytical Services, LLC Kentucky #_30384693

0084065

Analysis		Expires	Laboratory ID	Comments
Sample ID: 0084065-06	**Water**	**Sampled:09/24/2020 15:00**	**Specific Method**	
Radium Total (sub)		03/23/2021 15:00	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/23/2021 15:00	EPA 903.1	
Radium 228 (sub)		03/23/2021 15:00	EPA 904.0 Radium Sum C	

Released By	Date	Received By	Date
		A Hoer	09/29/20 1040
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: PACE KY

Project # #-30384693

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label BLM
LIMS Login BLM

Tracking #: 110733867897

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used 10 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 7.4 °C Correction Factor: 0.5 °C Final Temp: 6.9 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D0401 / Date and Initials of person examining contents: 09/29/20
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓	✓		5. NO date/time listed on client samples
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓	✓		10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. PH<2
All containers meet method preservation requirements.	✓			Initial when completed: AF Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: AF Date: 09/29/20

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

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Certificate of Analysis
0101830

Chad Phillips
Big Rivers Electric Corporation Reid/Green Station
PO Box 24
Henderson KY, 42419

Customer ID: 44-102032
Report Printed: 10/26/2020 10:41

Project Name:	HMPL Surface Impoundment	Workorder:	0101830

Dear Chad Phillips

Enclosed are the analytical results for samples received at one of our laboratories on 10/01/2020 15:31.

Pace Analytical Services LLC Kentucky is a commercial laboratory accredited by various state and national authorities, including Indiana, Kentucky, Tennessee, and Virginia's National Environmental Laboratory Accreditation Program (NELAP). With the NELAP accreditation, applicable test results are certified to meet the requirements of the National Environmental Laboratory Accreditation Program.

If you have any questions concerning this report please contact the individual listed below.

Please note that this certificate of analysis may not be reproduced without the written consent of Pace Analytical Services, LLC Kentucky.

#460210 Madisonville, KY
#460293 Pikeville, KY

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Rob Whittington, Project Manager

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SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
0101830-01	MW-110/	Groundwater	10/01/2020 10:40	10/01/2020 15:31	Phillip Hill

LabNumber	Measurement	Value
0101830-01	Field Conductance	950
	Field pH	7.56
	Field Temp (C)	17.55

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ANALYTICAL RESULTS

Lab Sample ID: **0101830-01**
Description: **MW-110**

Sample Collection Date Time: 10/01/2020 10:40
Sample Received Date Time: 10/01/2020 15:31

Metals by SW846 6000 Series Methods

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Antimony	ND	M4, U	mg/L	0.005	0.002	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Arsenic	**0.0004**	J	mg/L	0.0010	0.0004	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Barium	**0.056**	M1	mg/L	0.004	0.001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Beryllium	ND	M4, U	mg/L	0.0020	0.0010	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Boron	**0.53**	D2, M1, M4	mg/L	0.10	0.10	SW846 6010 B	10/02/2020 10:55	10/23/2020 14:24	DMH
Cadmium	ND	U	mg/L	0.0010	0.0001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Calcium	**162**	D1, M2	mg/L	40.0	13.0	SW846 6010 B	10/02/2020 10:55	10/02/2020 16:50	dmh
Chromium	**0.0016**	J	mg/L	0.0020	0.0006	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Cobalt	ND	M4, U	mg/L	0.004	0.004	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Lead	**0.0008**	J	mg/L	0.002	0.0005	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Lithium	**0.02**	M4	mg/L	0.02	0.005	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Mercury	ND	M1, M4, U	mg/L	0.0005	0.0002	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Molybdenum	ND	M4, U	mg/L	0.01	0.002	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Selenium	ND	M4, U	mg/L	0.003	0.001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH
Thallium	ND	U	mg/L	0.0020	0.0001	SW846-6020 A	10/02/2020 10:55	10/03/2020 14:47	DMH

Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
pH (Lab)	**7.25**	H1	Std. Units	0.10	0.10	4500-H+ B-2000	10/05/2020 15:07	10/05/2020 15:07	GAT
Total Dissolved Solids	**1060**		mg/L	50	50	2540 C-2011	10/06/2020 11:46	10/07/2020 13:45	MAG

Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	**0.065**	_Sub	pCi/L			EPA 903.1	10/21/2020 00:00	10/21/2020 00:00	xxx
Radium-228	**0.876**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/21/2020 00:00	10/21/2020 00:00	xxx
Radium	**0.941**	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	10/21/2020 00:00	10/21/2020 00:00	xxx

Ion Chromatography Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	**19.9**		mg/L	2.0	1.3	SW846 9056	10/02/2020 22:17	10/02/2020 22:17	CSC
Fluoride	**0.3**		mg/L	0.2	0.1	SW846 9056	10/02/2020 22:17	10/02/2020 22:17	CSC
Sulfate	**411**	D	mg/L	100	50	SW846 9056	10/02/2020 22:48	10/02/2020 22:48	CSC

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Notes for work order 0101830

- 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.
H1	Sample analysis performed past holding time.
J	Estimated value.
J5	Concentration estimated. Internal standard recoveries did not meet method acceptance criteria.
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.
U	Target analyte was analyzed for , but was below detection limit (the value associated with the qualifier is the laboratory method detection limit in our LIMS system).

Standard Qualifiers/Acronymns

MDL	Method Detection Limit
MRL	Minimum Reporting Limit
ND	Not Detected
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
% Rec	Percent Recovery
RPD	Relative Percent Difference
>	Greater than
<	Less than

Results relate only to the items tested.

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Blank (B040473-BLK1)										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 16:31										
Boron	ND	0.10	mg/L							U
Calcium	ND	0.40	mg/L							U
Blank (B040473-BLK2)										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:21										
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
LCS (B040473-BS1)										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 16:34										
Boron	0.13	0.10	mg/L	0.125		106	85-115			
Calcium	6.68	0.40	mg/L	6.25		107	85-115			
LCS (B040473-BS2)										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:25										
Mercury	0.0025	0.0005	mg/L	0.00250		101	85-115			
Molybdenum	0.07	0.01	mg/L	0.0625		109	85-115			
Antimony	0.071	0.005	mg/L	0.0625		113	85-115			
Arsenic	0.0666	0.0010	mg/L	0.0625		107	85-115			
Barium	0.067	0.004	mg/L	0.0625		107	85-115			
Beryllium	0.0654	0.0020	mg/L	0.0625		105	85-115			
Cadmium	0.0659	0.0010	mg/L	0.0625		105	85-115			
Chromium	0.0671	0.0020	mg/L	0.0625		107	85-115			
Cobalt	0.067	0.004	mg/L	0.0625		107	85-115			
Lead	0.067	0.002	mg/L	0.0625		107	85-115			
Lithium	0.07	0.02	mg/L	0.0625		105	85-115			
Selenium	0.066	0.003	mg/L	0.0625		106	85-115			
Thallium	0.0679	0.0020	mg/L	0.0625		109	85-115			

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Matrix Spike (B040473-MS1) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:34										
Boron	ND	10.0	mg/L	0.125	ND		80-120			D2, M4, U
Calcium	165	40.0	mg/L	6.25	162	49.3	80-120			D2, M2
Matrix Spike (B040473-MS2) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 13:43										
Antimony	ND	0.500	mg/L	0.0625	ND		80-120			D2, M4, U
Molybdenum	ND	1.00	mg/L	0.0625	ND		80-120			D2, M4, U
Mercury	ND	0.0500	mg/L	0.00250	ND		80-120			D2, M4, U
Arsenic	0.0676	0.100	mg/L	0.0625	ND	108	80-120			D2, J
Barium	0.122	0.400	mg/L	0.0625	ND	195	80-120			D2, M1, J
Beryllium	ND	0.200	mg/L	0.0625	ND		80-120			D2, M4, U
Cadmium	0.0615	0.100	mg/L	0.0625	ND	98.4	80-120			D2, J
Chromium	0.0704	0.200	mg/L	0.0625	ND	113	80-120			D2, J
Cobalt	ND	0.400	mg/L	0.0625	ND		80-120			D2, M4, U
Lead	0.062	0.200	mg/L	0.0625	ND	99.5	80-120			D2, J
Lithium	ND	2.00	mg/L	0.0625	ND		80-120			D2, M4, U
Selenium	ND	0.300	mg/L	0.0625	ND		80-120			D2, M4, U
Thallium	0.0617	0.200	mg/L	0.0625	ND	98.7	80-120			D2, J
Matrix Spike Dup (B040473-MSD1) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:37										
Boron	ND	10.0	mg/L	0.125	ND		80-120		20	D2, M4, U
Calcium	159	40.0	mg/L	6.25	162	NR	80-120	3.66	20	D2, M2
Matrix Spike Dup (B040473-MSD2) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 14:29										
Antimony	ND	0.500	mg/L	0.0625	ND		80-120		20	D2, M4, U
Mercury	ND	0.0500	mg/L	0.00250	ND		80-120		20	D2, M4, U
Molybdenum	ND	1.00	mg/L	0.0625	ND		80-120		20	D2, M4, U
Arsenic	0.0667	0.100	mg/L	0.0625	ND	107	80-120	1.42	20	D2, J
Barium	0.126	0.400	mg/L	0.0625	ND	201	80-120	3.10	20	D2, M1, J
Beryllium	ND	0.200	mg/L	0.0625	ND		80-120		20	D2, M4, U
Cadmium	0.0644	0.100	mg/L	0.0625	ND	103	80-120	4.66	20	D2, J
Chromium	0.0678	0.200	mg/L	0.0625	ND	108	80-120	3.83	20	D2, J
Cobalt	ND	0.400	mg/L	0.0625	ND		80-120		20	D2, M4, U
Lead	0.064	0.200	mg/L	0.0625	ND	103	80-120	3.34	20	D2, J
Lithium	ND	2.00	mg/L	0.0625	ND		80-120		20	D2, M4, U
Selenium	ND	0.300	mg/L	0.0625	ND		80-120		20	D2, M4, U
Thallium	0.0640	0.200	mg/L	0.0625	ND	102	80-120	3.66	20	D2, J

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Metals by SW846 6000 Series Methods - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040473 - EPA 200.2										
Post Spike (B040473-PS1) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/2/2020 17:41										
Boron	687		ug/L	125	534	123	75-125			D2, M1
Calcium	169000		ug/L	6250	162000	106	75-125			D2
Post Spike (B040473-PS2) **Source: 0101830-01**										
Prepared: 10/2/2020 10:55, Analyzed: 10/3/2020 15:01										
Antimony	65.1		ug/L	62.5	0.102	104	75-125			D2
Mercury	5.11		ug/L	2.50	0.0349	203	75-125			D2, M1
Molybdenum	63.6		ug/L	62.5	0.32	101	75-125			D2
Arsenic	65.1		ug/L	62.5	0.369	104	75-125			D2
Barium	125		ug/L	62.5	55.6	110	75-125			D2
Beryllium	64.9		ug/L	62.5	0.153	104	75-125			D2, J5
Cadmium	60.0		ug/L	62.5	0.0093	96.0	75-125			D2
Chromium	69.9		ug/L	62.5	1.64	109	75-125			D2
Cobalt	64.6		ug/L	62.5	0.462	103	75-125			
Lead	60.3		ug/L	62.5	0.827	95.2	75-115			D2
Lithium	87.2		ug/L	62.5	16.4	113	75-125			D2, J5
Selenium	66.7		ug/L	62.5	0.032	107	75-125			D2
Thallium	58.7		ug/L	62.5	0.0056	94.0	75-125			D2

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Conventional Chemistry Analyses Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B041075 - Default Prep Wet Chem										
LCS (B041075-BS1)										
Prepared: 10/5/2020 14:58, Analyzed: 10/5/2020 14:58										
pH (Lab)	8.01		Std. Units	8.00		100	98.8-101.2			
LCS (B041075-BS2)										
Prepared: 10/5/2020 15:14, Analyzed: 10/5/2020 15:14										
pH (Lab)	8.01		Std. Units	8.00		100	98.8-101.2			
Duplicate (B041075-DUP1) **Source: 0101962-02**										
Prepared: 10/5/2020 15:12, Analyzed: 10/5/2020 15:12										
pH (Lab)	9.09	0.10	Std. Units		9.09			0.00	10	
Duplicate (B041075-DUP2) **Source: 0101962-04**										
Prepared: 10/5/2020 15:17, Analyzed: 10/5/2020 15:17										
pH (Lab)	7.20	0.10	Std. Units		7.20			0.00	10	
Batch B041144 - Default Prep Wet Chem										
Blank (B041144-BLK1)										
Prepared: 10/6/2020 11:14, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	ND	25	mg/L							U
LCS (B041144-BS1)										
Prepared: 10/6/2020 11:18, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	1400	25	mg/L	1500		93.0	80-120			
Duplicate (B041144-DUP1) **Source: 0050661-03**										
Prepared: 10/6/2020 11:54, Analyzed: 10/7/2020 13:45										
Total Dissolved Solids	224	50	mg/L		210			6.45	10	

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Ion Chromatography Madisonville - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B040540 - Default Prep IC										
Blank (B040540-BLK1)										
Prepared: 10/2/2020 19:28, Analyzed: 10/2/2020 19:28										
Chloride	ND	2.0	mg/L							U
Fluoride	ND	0.2	mg/L							U
Sulfate	ND	1	mg/L							U
LCS (B040540-BS1)										
Prepared: 10/2/2020 19:12, Analyzed: 10/2/2020 19:12										
Fluoride	9.6		mg/L	10.0		96.1	90-110			
Chloride	9.8		mg/L	10.0		98.2	90-110			
Sulfate	10		mg/L	10.0		95.0	90-110			
Matrix Spike (B040540-MS1) **Source: 0101801-01**										
Prepared: 10/2/2020 23:50, Analyzed: 10/2/2020 23:50										
Chloride	22.1		mg/L	10.0	9.1	130	75-125			M1
Fluoride	13.9		mg/L	10.0	0.2	137	75-125			M1
Sulfate	14		mg/L	10.0	0.05	139	75-125			M1
Matrix Spike Dup (B040540-MSD1) **Source: 0101801-01**										
Prepared: 10/3/2020 0:05, Analyzed: 10/3/2020 0:05										
Fluoride	12.4		mg/L	10.0	0.2	123	75-125	10.7	15	
Chloride	21.0		mg/L	10.0	9.1	119	75-125	5.29	15	
Sulfate	12		mg/L	10.0	0.05	124	75-125	11.2	15	

Certified Analyses included in this Report

Analyte	Certifications
2540 C-2011 in Water	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
4500-H+ B-2000 in Water	
pH (Lab)	KY Drinking Water Mdv (00030) TN Drinking Water (02819)
SW846 6010 B in Water	

Pace Analytical Services, LLC
P.O. Box 907
Madisonville, KY 42431
270.821.7375
www.pacelabs.com

Sample Acceptance Checklist for Work Order 0101830

Shipped By: Client

Temperature: 2.10° Celcius

Condition	
Check if Custody Seals are Present/Intact	☐
Check if Custody Signatures are Present	☑
Check if Collector Signature Present	☑
Check if bottles are intact	☑
Check if bottles are correct	☑
Check if bottles have sufficient volume	☑
Check if samples received on ice	☑
Check if VOA headspace is acceptable	☐
Check if samples received in holding time.	☑
Check if samples are preserved properly	☑

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#:
Quote#

Please Print Legibly

Collected by (Signature): *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY
Workorder # 0084065

Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
				✓			
0084065-07 A	10/1/20	1040	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 : ✓				
0084065-07 B	10/1/20	1040	Plastic 1L	1	MW-110	g / c	Fluoride 9056 TDS Sulfate 9056 pH (Lab) Chloride 9056
0084065-07 C	10/1/20	1040	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW-110	g / c	Radium 226 (sub)
			Preservation Check: pH : ✓				

0101830 AEI 10-1-20

Preservation Check Performed by: AEI

Field data collected by: Phillip Hill Date (mm/dd/yy) 10/1/20 Time (24 hr) 1040

pH 7.56 Cond ~~(umho)~~ mS/cm 0.950 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 17.55 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)
		10/1/20	1531

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 8/26/2020 9:03:36AM

Pace Analytical Services LLC Kentucky
P.O. Box 907
Madisonville, KY 42431

Chain of Custody

Scheduled for: 08/26/2020

Client: Big Rivers Electric Corporation Reid/Green Station

Project: HMPL Surface Impoundment

Report To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
Phone: (270) 844-6000
PWS ID#:
State: KY

Invoice To:
Big Rivers Electric Corporation Reid/Green Station
Chad Phillips
PO Box 24
Henderson, KY 42419
PO#: _____
Quote# _____

Please Print Legibly

Collected by (Signature): _____ *required information*

Compliance Monitoring? Yes ___ No ___

Samples Chlorinated? Yes ___ No ___

*For composite samples please indicate begin time, end time and temp(oC) at end time below:

Influent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

Effluent: Start Date _____ Start time _____ End Date _____ End Time _____ Temp (oC) _____

LAB USE ONLY Workorder # 0084065 Sample ID#	*required information* Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
0084065-07 D	10/1/20	1040	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-07 E	10/1/20	1040	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1	MW-110	g / c	Radium 228 (sub)
			Preservation Check: pH : ✓				
0084065-07 F	10/1/20	1040	Plastic 1L pH<2 w/HNO3 (Sub)	1	MW-110	g / c	Radium Total (sub)
			Preservation Check: pH : ✓				

0101830
ACI 10-1-20

Preservation Check Performed by: ACI

Field data collected by: Phillip Hall Date (mm/dd/yy) 10/1/20 Time (24 hr) 1040

pH 7.56 Cond ~~(umho)~~ mS/cm 0.950 Res Cl (mg/L) _____ Tot Cl (mg/L) _____ Free Cl (mg/L) _____

Temp (oC) 17.55 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)
	abby Lark	10/1/20	1531

☐ **PACE- Check here if trip charge applied to associated COC**

Printed: 8/26/2020 9:03:36AM

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

October 22, 2020

Rob Whittington
Pace Analytical Madisonville
825 Industrial Rd
Madisonville, KY 42431

RE: Project: 101830
Pace Project No.: 30385783

Dear Rob Whittington:

Enclosed are the analytical results for sample(s) received by the laboratory on October 06, 2020. 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,

Carin A. Ferris

Carin Ferris
carin.ferris@pacelabs.com
724-850-5615
Project Manager

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

CERTIFICATIONS

Project: 101830
Pace Project No.: 30385783

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE SUMMARY

Project: 101830
Pace Project No.: 30385783

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30385783001	**0101830-01**	Water	10/01/20 10:40	10/06/20 09:45

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

SAMPLE ANALYTE COUNT

Project: 101830
Pace Project No.: 30385783

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30385783001	**0101830-01**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 101830
Pace Project No.: 30385783

Sample: 0101830-01 **Lab ID: 30385783001** Collected: 10/01/20 10:40 Received: 10/06/20 09:45 Matrix: Water
PWS: Site ID: Sample Type:

Comments: • Sample collection time on containers does not match COC; client was notified.

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0647 ± 0.381 (0.778) C:NA T:81%**	pCi/L	10/21/20 12:10	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.876 ± 0.535 (1.02) C:75% T:77%**	pCi/L	10/21/20 14:25	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.941 ± 0.916 (1.80)**	pCi/L	10/22/20 12:35	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 101830
Pace Project No.: 30385783

QC Batch: 418100
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30385783001

METHOD BLANK: 2021261 Matrix: Water
Associated Lab Samples: 30385783001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0279 ± 0.295 (0.681) C:84% T:85%	pCi/L	10/21/20 14:23	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALITY CONTROL - RADIOCHEMISTRY

Project: 101830
Pace Project No.: 30385783

QC Batch: 418098
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 30385783001

METHOD BLANK: 2021260 Matrix: Water
Associated Lab Samples: 30385783001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.104 ± 0.407 (0.779) C:NA T:84%	pCi/L	10/21/20 11:46	

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

Pace Analytical Services, LLC
1638 Roseytown Road - Suites 2,3,4
Greensburg, PA 15601
(724)850-5600

QUALIFIERS

Project: 101830
Pace Project No.: 30385783

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.

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.

WO# : 30385783

30385783

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: 101830 Workorder Name: HMPL Surface Impoundme Owner Received Date: 10/1/2020 Results Requested By:

Report To:	Subcontract To:	Requested Analysis

McCoy & McCoy Labs
P.O. Box 907
Madisonville, KY 42409
270-821-7375
rob.whittington@pacelabs.com

Pace Analytical Services LLC Greensburg PA
1638 Rosey Town Rd Suite 2,3,4
Greensburg, PA 15601
(724) 850-5615

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					EPA 903.1	EPA 904.0 Radium Sum Calc										LAB USE ONLY
1																						
2	0101830-01		10/01/20 10:40	IR44-McCoy	Water						X	X										COI
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1				10/6/20 0945	
2					
3					

Cooler Temperature on Receipt 3.6 °C	Custody Seal Y or (N)	Received on Ice (Y) or N	Sample Intact (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

SUBCONTRACT ORDER # 30385783

Pace Analytical Services, LLC Kentucky

0101830

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: 0101830-01	**Water**	**Sampled:10/01/2020 10:40**	**Specific Method**	
Radium Total (sub)		03/30/2021 10:40	EPA 904.0 Radium Sum C	
Radium 228 (sub)		03/30/2021 10:40	EPA 904.0 Radium Sum C	
Radium 226 (sub)		03/30/2021 10:40	EPA 903.1	

Released By	Date	Received By	Date
	10-5-20		10/6/20 09:45
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: PACE KY

Project # #-30385783

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label JSM
LIMS Login JSM

Tracking #: 107338868654

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☑ no

Thermometer Used 10 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.1 °C Correction Factor: 0.5 °C Final Temp: 3.6 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot# 10D0401 — Date and Initials of person examining contents: AF 10/6/20
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. AF 10/6/20 No time ~~Label on sample~~ AF 10/6/20 on sample doesn't match C.O.C.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:		✓		
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH < 2
All containers meet method preservation requirements.	✓			Initial when completed AF — Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: AF — Date: 10/6/20

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: All bottles have Fne time as 1540 for sampled time

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Appendix H
Green Landfill Statistical Evaluations

GREEN LANDFILL STATISTICAL ANALYSIS

2020 Annual Groundwater Monitoring Report

1.0 INTRODUCTION

Previous statistical analysis of Green Landfill groundwater monitoring data has indicated that certain 40 CFR Part 257 Appendix III constituents at downgradient monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 occur at statistically significant higher concentrations than in background monitoring well MW-1. Based on these results, assessment monitoring is conducted for both 40 CFR Part 257 Appendix III and IV parameters.

The 40 CFR Part 257 Appendix III and IV 2020 groundwater monitoring data at the Green Landfill were evaluated to determine the occurrence of any statistically significant increases over background (SSIs) and whether or not any of the SSIs occurred at a statistically significant level (SSL) above the groundwater protection standard as defined at 40 CFR.95(h).

2.0 STATISTICAL ANALYSIS

A determination of whether SSIs have occurred is required by 40 CFR 257.93(h)(2) for each semiannual monitoring event. The occurrence of SSIs was evaluated using an *interwell* prediction limit approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at the background monitoring well. For the Green Landfill, monitoring well MW-1 is designated as the background well, whereas monitoring wells MW-2, MW-3A, MW-4, MW-5, and MW-6 are designated downgradient detection monitoring wells.

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), the Groundwater Monitoring System and Statistical Methods Certification, and following guidance presented in ASTM D6312-17 *Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs,* and US EPA (2009) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. The test procedures were designed to balance facility-wide false positive rate and statistical power.

Site data are maintained in a Sanitas™ statistical evaluation database that was used to conduct the analyses presented herein.

2.1 Prediction Limits

Appropriate statistical prediction limits (PLs) were developed for each of the 21 Appendix III and Appendix IV monitoring constituents, as outline below, and followed the following general procedures.

1. Analytical Data Review
2. Goodness-of-Fit Testing
3. Perform adjustments to data based on the frequency on non-detect values
4. Comparison to interstation background

The background data set for the statistical analyses consisted of analytical measurements at MW-1 from March 2016 to April 2020 for the April monitoring event. The background utilized for the September 2020 analysis was updated to include the data from that event.

2.2 Analytical Data Review

Analytical data were reviewed for consistency with historic data prior to any statistical evaluation. Background data were checked for outliers and high or low outliers were removed following EPA (1989) procedures prior to statistical analysis. Outliers include some previous values with elevated detection limits.

2.2.1 Goodness-of-Fit Testing

Four types of background monitoring data sets.

1. Normally distributed (or transformed normal) data sets with the frequency of censored (non-detect) values less than 50 percent
2. Non-normal (or transformed non-normal) data sets with the frequency of censored values less than 50 percent
3. Data sets for which the population distribution is not known due to the frequency of censored values greater than 50 percent
4. Data consisting of 100 percent censored values

The appropriate statistical comparison depends on the type of data set under consideration. Parametric test procedures are utilized wherever possible to increase statistical power. In general, parametric tests are utilized where the data distribution may be assumed to be normal, or transformed normal (data set 1, above). Non-parametric procedures are used where data may not confidently be assumed to be normal (data set 2, above), or where the frequency of non-detect values precludes the testing of normality (data set 3, above). Finally, it is recognized that for 100 percent non-detect data (data set 4, above) no valid statistical comparison may be made, and comparisons must be made to fixed, arbitrary values, such as the analytical method detection or quantitation limit.

To determine the type of dataset, goodness-of-fit testing was performed on both the raw data and natural logarithm of the raw greater than detection limit values using the Shapiro-Wilk W-test as recommended by US EPA (1992) and Gilbert (1987). The tests were conducted at a 95 percent confidence level with outliers removed from the dataset.

Data sets that could not confidently be determined to be normally or log normally distributed were used to determine *nonparametric* prediction limits. Data that were normally or log normally distributed were considered as a basis for calculating *parametric* prediction limits, providing that the percentage of less than detection limit values was greater than 50 percent.

2.2.2 Adjustments to Data Based on the Frequency of Non-Detect Values

After goodness-of-fit testing was completed, the frequency of less than detection limit (left censored) values was be evaluated. If the degree of left-censoring was greater than 15%, Aitchison's adjustment was used to obtain adjusted estimates of the sample mean and standard deviation. These adjusted values were then used to calculate the upper prediction limit for those data determined to be normally or log normally distributed during goodness-of-fit testing. For the statistical analysis, non-detect values were represented as one-half the detection limit.

If the degree of censoring is 50% to 100%, no method exists to reasonably estimate the sample mean and standard deviation. In this case, non-parametric procedures are utilized. If the degree of censoring is 100%, as is commonly the case with volatile organic compounds, no estimates of statistics can be calculated. In this case, a simple comparison to method reporting limit (RL) of the individual analyte is employed as the initial statistical evaluation.

2.2.3 Comparison to Background

Based on the results for goodness-of-fit testing and the degree of censoring of the various data sets, comparisons to background were made using prediction limit procedures (US EPA, 2009). Parametric prediction limits were utilized where the data may be assumed to be normally or log normally distributed.

If the data are determined to be not normal or log normal, or the frequency of non-detect values is greater than 50%, nonparametric upper prediction limits were calculated, as recommended by US EPA (2009).

The prediction limit comparisons balance statistical power and false positive rate, as recommended by US EPA (1992, 2009) and ASTM D6312-17 using verification resampling as discussed below.

2.2.4 False Positive Rate Control

A groundwater monitoring event involves a large number of individual statistical comparisons. For normal prediction limits, if the significance level of an individual statistical comparison (test) is α (defined as the *per-test* false positive rate), the *annual* false positive rate (α^*) is given by (Gibbons 1994):

Equation 1

$$\alpha^* = 1 - (1-\alpha)^r$$

where,

r = the number of annual statistical comparisons to be made
(downgradient monitoring stations × analytes × events per year.

For a typical monitoring scenario, the per-test α is held to a value *no less* than 0.01 (40 CFR 257.93(g)(2). Limiting α to the minimum value of 0.01 guards against an excessive false negative rate, or Type II error, but may result in too large an *event-wide* false positive rate. For each of the 2020 monitoring events there are 21 parameters requiring statistical evaluation (Table H1, c =21). There are five downgradient detection monitoring wells in the evaluation (Table H1, w = 5). Assuming two annual statistical evaluations, one associated with each semiannual sample event (n_E = 2), the number of annual statistical comparisons (r) is equal to c x w x n_E = 210. From Equation 1, the annual false positive rate for the two sampling events is 0.88 (Table H1, Row 1). Thus, during each sampling year there would be about an 88 percent probability that a statistically significant result would be obtained even though no real statistical exceedance occurred.

To limit the annual false positive rate to 0.1, as suggested by EPA (2009) (or to a corresponding event-wide false positive rate of 0.05 for semiannual sampling per 40 CFR 257.93(g)(2)), Equation 1 indicates that individual tests would have to be conducted at a significance levels of about 0.00050 (Table H1, Row 2). Very large statistical limits would have to be employed, and the individual *false negative* rate would be unacceptably high at this significance level.

Alternatively, a *verification resampling* strategy is employed to limit the annual-wide false positive rate while maintaining adequate statistical power (EPA 1992, 2009; Gibbons 1994; ASTM 2017). *A statistically significant increase is not declared until both the original sample and some number of verification resamples fail the statistical test procedures*. For the case of one or two verification resampling events, and assuming independence of measurements, α^* may be calculated as (EPA 2009):

Equation 2

$$\alpha^* = 1 - (1-\alpha^m)^r$$

where,

m = the sum of the original sample and number of retest verification samples (1 or 2).

Passing any resample passes the statistical evaluation procedure.

Table H1 Row 3 illustrate a single resample strategy with the resample required to pass. Table H1 Row 4 Row 4 illustrate the case of two verification resamples with one of the two required to pass.

EPA (2009) and 40 CFR 257.93(g)(2) defines two criteria applicable to statistical analysis of groundwater monitoring data:

1. The per-event false positive rate (α^*) shall be no less than 0.05 per evert, or 0.1 annually, and,
2. The per-test false positive rate (α) shall be no less than 0.01.

These criteria were deemed by EPA to provide acceptable balance between false positive rate control and statistical power and are used for this project. The single verification sample resampling strategy (Table H1, Row 3) fits the EPA criteria and minimizes sampling and analytical cost. A single verification resampling strategy (referred to as "Pass 1 of 2") using a per-test significance level of 0.02240 was therefore used for this statistical analysis. An SSI does not occur unless the original sample and the verification resample both fail the statistical testing.

2.3 Comparison to Groundwater Protection Standard

Appendix IV well / constituents with SSIs indicated by the PL analysis were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the groundwater protection standards (GWPSs). This evaluation was conducted by calculating the parametric or non-parametric 95% confidence limits for each well / constituent identified as an SSI using the baseline, detection, and assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its 95% lower mean confidence limit must be greater than the GWPS.

3.0 RESULTS

Prediction limit results for the two 2020 sampling events are provided in Tables H2 and H3. Interwell exceedances of the relevant PL values are highlighted. Time series plots showing prediction limit results are provided for each downgradient well / parameter in Attachment 1 (April 7, 2020 event) and Attachment 2 (September 22 event). Plots in the attachments are arranged in the constituent order listed in the tables.

Comparison to groundwater protection standard results are provided in Tables H4 and H5.

3.1 Exceedances of Background

The following SSIs were noted for the April 7 event (Table H2).

MW-2	arsenic, barium, calcium, chloride, sulfate, total dissolved solids
MW-3A	calcium, chloride, lithium, pH (field), sulfate, total dissolved solids
MW-4	calcium, chloride, lithium, mercury, pH (field), selenium, sulfate, total dissolved solids
MW-5	calcium, chloride, lithium, pH (field), sulfate, total dissolved solids
MW-6	calcium, chloride, lithium, pH (field), sulfate, total dissolved solids

Similar results were noted for the September 22 event with exceedances for the following (Table H3).

MW-2	arsenic, barium, calcium, chloride, pH (field), sulfate, total dissolved solids
MW-3A	calcium, chloride, cobalt, lithium, pH (field), sulfate, total dissolved solids
MW-4	calcium, chloride, lithium, mercury, pH (field), sulfate, total dissolved solids
MW-5	calcium, chloride, lithium, pH (field), sulfate, total dissolved solids
MW-6	calcium, chloride, lithium, pH (field), sulfate, total dissolved solids

Results for exceedances of background were generally consistent between the two events and consistent with the 2019 results. Appendix IV SSIs in April occurred for arsenic at MW-2, barium at MW-2, lithium at MW-3A, MW-4, MW-5, and MW-6, mercury at MW-4, and selenium at MW-4. Appendix IV SSIs in September were the same as for April except that the selenium occurrence at MW-4 in April did not reoccur in September, and the cobalt occurrence at MW-3A in September that did not occur in April.

3.2 Comparison to Groundwater Protection Standards

Pursuant to 40 CFR 257.95(f) Appendix IV well / parameters with 2020 SSIs were further evaluated to determine whether they are present at a statistically significant level over the groundwater protection standard. This analysis was conducted by calculating the appropriate parametric or nonparametric 95 percent lower confidence limit (95% LCL) for each well / parameter identified as an SSI for each 2020 event.

The eight Appendix IV SSIs occurring in April are listed in Table H4 showing the 95% LCL computation results compared to the relevant GWPS. The eight Appendix IV SSIs occurring in September are similarly listed in Table H5. The only exceedances of GWPSs for either 2020 sampling event are for lithium at MW-3A, MW-4, MW-5, and MW-6. These results are consistent with the 2019 analysis. A time series plot of the lithium concentration at these wells is provided in Figure H1.

4.0 REFERENCES

American Society for Testing and Materials (ASTM), 2017, *Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs at Waste Disposal Facilities*. Designation D 6312-17.

Gibbons, R.D. 1994. *Statistical Methods in Ground-Water Monitoring*. John Wiley & Sons.

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US EPA, 1989, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance*. Office of Solid Waste Management Division, US EPA, Washington, DC.

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Tables

Table H1
2020 Annual Monitoring Report
BREC Green Landfill
Calculation of False Positive Rates

Row Number	*Number of Downgradient Stations (w)*	*Number of Constituents (c)*	*Number of Annual Evaluations (n_E)*	*Number of Annual Comparisons ($r = w \times c \times n_E$)*	*Target Annual False Positive Rate (α^*)*	*Retest Strategy (1 of m)*	*Individual Comparison False Positive Rate (α)*
1	5	21	2	210	0.88	1	0.01005
2	5	21	2	210	0.1	1	0.00050
3	5	21	2	210	0.1	2	0.02240
4	5	21	2	210	0.1	3	0.07945

Table H2: 2020 Annual Monitoring Report, BREC Green Landfill, April 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-2	0.00297	n/a	4/7/2020	0.001ND	No	13	MW-1	n/a	n/a	38.46	n/a	n/a	0.06301	NP Inter (xform)
Antimony (mg/L)	MW-3A	0.00297	n/a	4/7/2020	0.001ND	No	13	MW-1	n/a	n/a	38.46	n/a	n/a	0.06301	NP Inter (xform)
Antimony (mg/L)	MW-4	0.00297	n/a	4/7/2020	0.001ND	No	13	MW-1	n/a	n/a	38.46	n/a	n/a	0.06301	NP Inter (xform)
Antimony (mg/L)	MW-5	0.00297	n/a	4/7/2020	0.001ND	No	13	MW-1	n/a	n/a	38.46	n/a	n/a	0.06301	NP Inter (xform)
Antimony (mg/L)	MW-6	0.00297	n/a	4/7/2020	0.001ND	No	13	MW-1	n/a	n/a	38.46	n/a	n/a	0.06301	NP Inter (xform)
Arsenic (mg/L)	**MW-2**	**0.00264**	**n/a**	**4/7/2020**	**0.0033**	**Yes**	**14**	**MW-1**	**n/a**	**n/a**	**0**	**n/a**	**n/a**	**0.05925**	**NP Inter**
Arsenic (mg/L)	MW-3A	0.00264	n/a	4/7/2020	0.0002ND	No	14	MW-1	n/a	n/a	0	n/a	n/a	0.05925	NP Inter
Arsenic (mg/L)	MW-4	0.00264	n/a	4/7/2020	0.0002ND	No	14	MW-1	n/a	n/a	0	n/a	n/a	0.05925	NP Inter
Arsenic (mg/L)	MW-5	0.00264	n/a	4/7/2020	0.0002ND	No	14	MW-1	n/a	n/a	0	n/a	n/a	0.05925	NP Inter
Arsenic (mg/L)	MW-6	0.00264	n/a	4/7/2020	0.0002ND	No	14	MW-1	n/a	n/a	0	n/a	n/a	0.05925	NP Inter
Barium (mg/L)	**MW-2**	**0.1021**	**n/a**	**4/7/2020**	**0.238**	**Yes**	**14**	**MW-1**	**0.08257**	**0.008486**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Barium (mg/L)	MW-3A	0.1021	n/a	4/7/2020	0.042	No	14	MW-1	0.08257	0.008486	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-4	0.1021	n/a	4/7/2020	0.022	No	14	MW-1	0.08257	0.008486	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-5	0.1021	n/a	4/7/2020	0.014	No	14	MW-1	0.08257	0.008486	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-6	0.1021	n/a	4/7/2020	0.011	No	14	MW-1	0.08257	0.008486	0	None	No	0.0224	Param Inter
Beryllium (mg/L)	MW-2	0.000533	n/a	4/7/2020	0.0005ND	No	12	MW-1	n/a	n/a	91.67	n/a	n/a	0.06729	NP Inter (NDs)
Beryllium (mg/L)	MW-3A	0.000533	n/a	4/7/2020	0.0005ND	No	12	MW-1	n/a	n/a	91.67	n/a	n/a	0.06729	NP Inter (NDs)
Beryllium (mg/L)	MW-4	0.000533	n/a	4/7/2020	0.0005ND	No	12	MW-1	n/a	n/a	91.67	n/a	n/a	0.06729	NP Inter (NDs)
Beryllium (mg/L)	MW-5	0.000533	n/a	4/7/2020	0.0005ND	No	12	MW-1	n/a	n/a	91.67	n/a	n/a	0.06729	NP Inter (NDs)
Beryllium (mg/L)	MW-6	0.000533	n/a	4/7/2020	0.0005ND	No	12	MW-1	n/a	n/a	91.67	n/a	n/a	0.06729	NP Inter (NDs)
Boron (mg/L)	MW-2	2.201	n/a	4/7/2020	0.05ND	No	15	MW-1	1.755	0.1959	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-3A	2.201	n/a	4/7/2020	0.26	No	15	MW-1	1.755	0.1959	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-4	2.201	n/a	4/7/2020	0.83	No	15	MW-1	1.755	0.1959	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-5	2.201	n/a	4/7/2020	0.25	No	15	MW-1	1.755	0.1959	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-6	2.201	n/a	4/7/2020	0.19	No	15	MW-1	1.755	0.1959	0	None	No	0.0224	Param Inter
Cadmium (mg/L)	MW-2	0.000299	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Cadmium (mg/L)	MW-3A	0.000299	n/a	4/7/2020	0.0001	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Cadmium (mg/L)	MW-4	0.000299	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Cadmium (mg/L)	MW-5	0.000299	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Cadmium (mg/L)	MW-6	0.000299	n/a	4/7/2020	0.0001	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Calcium (mg/L)	**MW-2**	**34.14**	**n/a**	**4/7/2020**	**145**	**Yes**	**14**	**MW-1**	**29.31**	**2.1**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-3A**	**34.14**	**n/a**	**4/7/2020**	**425**	**Yes**	**14**	**MW-1**	**29.31**	**2.1**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-4**	**34.14**	**n/a**	**4/7/2020**	**464**	**Yes**	**14**	**MW-1**	**29.31**	**2.1**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-5**	**34.14**	**n/a**	**4/7/2020**	**464**	**Yes**	**14**	**MW-1**	**29.31**	**2.1**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-6**	**34.14**	**n/a**	**4/7/2020**	**458**	**Yes**	**14**	**MW-1**	**29.31**	**2.1**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-2**	**8.835**	**n/a**	**4/7/2020**	**120**	**Yes**	**14**	**MW-1**	**6.096**	**1.192**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-3A**	**8.835**	**n/a**	**4/7/2020**	**3220**	**Yes**	**14**	**MW-1**	**6.096**	**1.192**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-4**	**8.835**	**n/a**	**4/7/2020**	**1560**	**Yes**	**14**	**MW-1**	**6.096**	**1.192**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-5**	**8.835**	**n/a**	**4/7/2020**	**1860**	**Yes**	**14**	**MW-1**	**6.096**	**1.192**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-6**	**8.835**	**n/a**	**4/7/2020**	**181**	**Yes**	**14**	**MW-1**	**6.096**	**1.192**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chromium (mg/L)	MW-2	0.00354	n/a	4/7/2020	0.0003ND	No	13	MW-1	n/a	n/a	61.54	n/a	n/a	0.06301	NP Inter (NDs)
Chromium (mg/L)	MW-3A	0.00354	n/a	4/7/2020	0.0003ND	No	13	MW-1	n/a	n/a	61.54	n/a	n/a	0.06301	NP Inter (NDs)
Chromium (mg/L)	MW-4	0.00354	n/a	4/7/2020	0.0008	No	13	MW-1	n/a	n/a	61.54	n/a	n/a	0.06301	NP Inter (NDs)
Chromium (mg/L)	MW-5	0.00354	n/a	4/7/2020	0.0003ND	No	13	MW-1	n/a	n/a	61.54	n/a	n/a	0.06301	NP Inter (NDs)
Chromium (mg/L)	MW-6	0.00354	n/a	4/7/2020	0.0003ND	No	13	MW-1	n/a	n/a	61.54	n/a	n/a	0.06301	NP Inter (NDs)

Table H2: 2020 Annual Monitoring Report, BREC Green Landfill, April 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Cobalt (mg/L)	MW-2	0.001624	n/a	4/7/2020	0.002ND	No	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-3A	0.001624	n/a	4/7/2020	0.002ND	No	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-4	0.001624	n/a	4/7/2020	0.002ND	No	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-5	0.001624	n/a	4/7/2020	0.002ND	No	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-6	0.001624	n/a	4/7/2020	0.002ND	No	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	n/a	0.001624	n/a	n/a	5 future	n/a	12	MW-1	0.0006041	0.0004329	16.67	Aitchison`s	No	0.1071	Param Inter
Fluoride (mg/L)	MW-2	0.6583	n/a	4/7/2020	0.2	No	13	MW-1	0.5482	0.04737	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-3A	0.6583	n/a	4/7/2020	0.5	No	13	MW-1	0.5482	0.04737	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-4	0.6583	n/a	4/7/2020	0.2	No	13	MW-1	0.5482	0.04737	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-5	0.6583	n/a	4/7/2020	0.2	No	13	MW-1	0.5482	0.04737	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-6	0.6583	n/a	4/7/2020	0.4	No	13	MW-1	0.5482	0.04737	0	None	No	0.0224	Param Inter
Lead (mg/L)	MW-2	0.000279	n/a	4/7/2020	0.00025ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter (NDs)
Lead (mg/L)	MW-3A	0.000279	n/a	4/7/2020	0.00025ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter (NDs)
Lead (mg/L)	MW-4	0.000279	n/a	4/7/2020	0.00025ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter (NDs)
Lead (mg/L)	MW-5	0.000279	n/a	4/7/2020	0.00025ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter (NDs)
Lead (mg/L)	MW-6	0.000279	n/a	4/7/2020	0.00025ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter (NDs)
Lithium (mg/L)	MW-2	0.03867	n/a	4/7/2020	0.007	No	14	MW-1	0.03093	0.003367	7.143	None	No	0.0224	Param Inter
Lithium (mg/L)	**MW-3A**	**0.03867**	**n/a**	**4/7/2020**	**0.68**	**Yes**	**14**	**MW-1**	**0.03093**	**0.003367**	**7.143**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-4**	**0.03867**	**n/a**	**4/7/2020**	**0.82**	**Yes**	**14**	**MW-1**	**0.03093**	**0.003367**	**7.143**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-5**	**0.03867**	**n/a**	**4/7/2020**	**0.38**	**Yes**	**14**	**MW-1**	**0.03093**	**0.003367**	**7.143**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-6**	**0.03867**	**n/a**	**4/7/2020**	**0.05**	**Yes**	**14**	**MW-1**	**0.03093**	**0.003367**	**7.143**	**None**	**No**	**0.0224**	**Param Inter**
Mercury (ug/L)	MW-2	0.2	n/a	4/7/2020	0.1ND	No	14	MW-1	n/a	n/a	100	n/a	n/a	0.05925	NP Inter (NDs)
Mercury (ug/L)	MW-3A	0.2	n/a	4/7/2020	0.1ND	No	14	MW-1	n/a	n/a	100	n/a	n/a	0.05925	NP Inter (NDs)
Mercury (ug/L)	**MW-4**	**0.2**	**n/a**	**4/7/2020**	**0.3**	**Yes**	**14**	**MW-1**	**n/a**	**n/a**	**100**	**n/a**	**n/a**	**0.05925**	**NP Inter (NDs)**
Mercury (ug/L)	MW-5	0.2	n/a	4/7/2020	0.1ND	No	14	MW-1	n/a	n/a	100	n/a	n/a	0.05925	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	4/7/2020	0.1ND	No	14	MW-1	n/a	n/a	100	n/a	n/a	0.05925	NP Inter (NDs)
Molybdenum (mg/L)	MW-2	0.002491	n/a	4/7/2020	0.002	No	13	MW-1	0.0009209	0.0006755	30.77	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-3A	0.002491	n/a	4/7/2020	0.001ND	No	13	MW-1	0.0009209	0.0006755	30.77	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-4	0.002491	n/a	4/7/2020	0.002	No	13	MW-1	0.0009209	0.0006755	30.77	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-5	0.002491	n/a	4/7/2020	0.001ND	No	13	MW-1	0.0009209	0.0006755	30.77	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-6	0.002491	n/a	4/7/2020	0.001ND	No	13	MW-1	0.0009209	0.0006755	30.77	Aitchison`s	No	0.0224	Param Inter
pH [Field] (SU)	MW-2	7.785	6.863	4/7/2020	6.92	No	14	MW-1	7.324	0.172	0	None	No	0.0112	Param Inter
pH [Field] (SU)	**MW-3A**	**7.785**	**6.863**	**4/7/2020**	**6.7**	**Yes**	**14**	**MW-1**	**7.324**	**0.172**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-4**	**7.785**	**6.863**	**4/7/2020**	**6.77**	**Yes**	**14**	**MW-1**	**7.324**	**0.172**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-5**	**7.785**	**6.863**	**4/7/2020**	**6.36**	**Yes**	**14**	**MW-1**	**7.324**	**0.172**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-6**	**7.785**	**6.863**	**4/7/2020**	**6.7**	**Yes**	**14**	**MW-1**	**7.324**	**0.172**	**0**	**None**	**No**	**0.0112**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-2	1.828	n/a	4/7/2020	0.529	No	13	MW-1	-0.1888	0.3407	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-3A	1.828	n/a	4/7/2020	1.06	No	13	MW-1	-0.1888	0.3407	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-4	1.828	n/a	4/7/2020	1.26	No	13	MW-1	-0.1888	0.3407	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	1.828	n/a	4/7/2020	1.48	No	13	MW-1	-0.1888	0.3407	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-6	1.828	n/a	4/7/2020	0.744	No	13	MW-1	-0.1888	0.3407	0	None	ln(x)	0.0224	Param Inter

Table H2: 2020 Annual Monitoring Report, BREC Green Landfill, April 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Selenium (mg/L)	MW-2	0.00105	n/a	4/7/2020	0.0005ND	No	13	MW-1	n/a	n/a	84.62	n/a	n/a	0.06301	NP Inter (NDs)
Selenium (mg/L)	MW-3A	0.00105	n/a	4/7/2020	0.0005ND	No	13	MW-1	n/a	n/a	84.62	n/a	n/a	0.06301	NP Inter (NDs)
Selenium (mg/L)	**MW-4**	**0.00105**	**n/a**	**4/7/2020**	**0.023**	**Yes**	**13**	**MW-1**	**n/a**	**n/a**	**84.62**	**n/a**	**n/a**	**0.06301**	**NP Inter (NDs)**
Selenium (mg/L)	MW-5	0.00105	n/a	4/7/2020	0.0005ND	No	13	MW-1	n/a	n/a	84.62	n/a	n/a	0.06301	NP Inter (NDs)
Selenium (mg/L)	MW-6	0.00105	n/a	4/7/2020	0.0005ND	No	13	MW-1	n/a	n/a	84.62	n/a	n/a	0.06301	NP Inter (NDs)
Sulfate (mg/L)	**MW-2**	**30.15**	**n/a**	**4/7/2020**	**85**	**Yes**	**14**	**MW-1**	**23.77**	**2.774**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-3A**	**30.15**	**n/a**	**4/7/2020**	**1840**	**Yes**	**14**	**MW-1**	**23.77**	**2.774**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-4**	**30.15**	**n/a**	**4/7/2020**	**4000**	**Yes**	**14**	**MW-1**	**23.77**	**2.774**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-5**	**30.15**	**n/a**	**4/7/2020**	**3720**	**Yes**	**14**	**MW-1**	**23.77**	**2.774**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-6**	**30.15**	**n/a**	**4/7/2020**	**4650**	**Yes**	**14**	**MW-1**	**23.77**	**2.774**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Thallium (mg/L)	MW-2	0.000498	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter
Thallium (mg/L)	MW-3A	0.000498	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter
Thallium (mg/L)	MW-4	0.000498	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter
Thallium (mg/L)	MW-5	0.000498	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter
Thallium (mg/L)	MW-6	0.000498	n/a	4/7/2020	0.00005ND	No	13	MW-1	n/a	n/a	53.85	n/a	n/a	0.06301	NP Inter
Total Dissolved Solids (mg/L)	**MW-2**	**654.6**	**n/a**	**4/7/2020**	**806**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-3A**	**654.6**	**n/a**	**4/7/2020**	**5860**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-4**	**654.6**	**n/a**	**4/7/2020**	**5120**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-5**	**654.6**	**n/a**	**4/7/2020**	**4960**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-6**	**654.6**	**n/a**	**4/7/2020**	**4610**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Inter - Parametric interstation prediction limit
n/a - not applicable
ND - Compound not detected, preceding number is one-half the reporting limit.
NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.
NDs - background data contain too high a percentage of non-detect values.
Param - Parametric Prediction Limit

Table H3: 2020 Annual Monitoring Report, BREC Green Landfill, September 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-2	0.00297	n/a	9/22/2020	0.001ND	No	14	MW-1	n/a	n/a	42.86	n/a	n/a	0.05925	NP Inter (xform)
Antimony (mg/L)	MW-3A	0.00297	n/a	9/22/2020	0.001ND	No	14	MW-1	n/a	n/a	42.86	n/a	n/a	0.05925	NP Inter (xform)
Antimony (mg/L)	MW-4	0.00297	n/a	9/22/2020	0.001ND	No	14	MW-1	n/a	n/a	42.86	n/a	n/a	0.05925	NP Inter (xform)
Antimony (mg/L)	MW-5	0.00297	n/a	9/22/2020	0.001ND	No	14	MW-1	n/a	n/a	42.86	n/a	n/a	0.05925	NP Inter (xform)
Antimony (mg/L)	MW-6	0.00297	n/a	9/22/2020	0.001ND	No	14	MW-1	n/a	n/a	42.86	n/a	n/a	0.05925	NP Inter (xform)
Arsenic (mg/L)	**MW-2**	**0.003468**	**n/a**	**44096**	**0.0095**	**Yes**	**15**	**MW-1**	**-7.199**	**0.6746**	**6.667**	**None**	**ln(x)**	**0.0224**	**Param Inter**
Arsenic (mg/L)	MW-3A	0.003468	n/a	44096	0.0002ND	No	15	MW-1	-7.199	0.6746	6.667	None	ln(x)	0.0224	Param Inter
Arsenic (mg/L)	MW-4	0.003468	n/a	9/22/2020	0.0002ND	No	15	MW-1	-7.199	0.6746	6.667	None	ln(x)	0.0224	Param Inter
Arsenic (mg/L)	MW-5	0.003468	n/a	9/22/2020	0.0002ND	No	15	MW-1	-7.199	0.6746	6.667	None	ln(x)	0.0224	Param Inter
Arsenic (mg/L)	MW-6	0.003468	n/a	9/22/2020	0.0002ND	No	15	MW-1	-7.199	0.6746	6.667	None	ln(x)	0.0224	Param Inter
Barium (mg/L)	**MW-2**	**0.1011**	**n/a**	**9/22/2020**	**0.336**	**Yes**	**15**	**MW-1**	**0.0822**	**0.008303**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Barium (mg/L)	MW-3A	0.1011	n/a	9/22/2020	0.043	No	15	MW-1	0.0822	0.008303	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-4	0.1011	n/a	9/22/2020	0.031	No	15	MW-1	0.0822	0.008303	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-5	0.1011	n/a	9/22/2020	0.014	No	15	MW-1	0.0822	0.008303	0	None	No	0.0224	Param Inter
Barium (mg/L)	MW-6	0.1011	n/a	9/22/2020	0.011	No	15	MW-1	0.0822	0.008303	0	None	No	0.0224	Param Inter
Beryllium (mg/L)	MW-2	0.000533	n/a	9/22/2020	0.0005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Beryllium (mg/L)	MW-3A	0.000533	n/a	9/22/2020	0.0005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Beryllium (mg/L)	MW-4	0.000533	n/a	9/22/2020	0.001ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Beryllium (mg/L)	MW-5	0.000533	n/a	9/22/2020	0.001ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Beryllium (mg/L)	MW-6	0.000533	n/a	9/22/2020	0.0005ND	No	13	MW-1	n/a	n/a	92.31	n/a	n/a	0.06301	NP Inter (NDs)
Boron (mg/L)	MW-2	2.179	n/a	9/22/2020	0.05ND	No	16	MW-1	1.749	0.1907	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-3A	2.179	n/a	9/22/2020	0.28	No	16	MW-1	1.749	0.1907	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-4	2.179	n/a	9/22/2020	1.7	No	16	MW-1	1.749	0.1907	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-5	2.179	n/a	9/22/2020	0.24	No	16	MW-1	1.749	0.1907	0	None	No	0.0224	Param Inter
Boron (mg/L)	MW-6	2.179	n/a	9/22/2020	0.19	No	16	MW-1	1.749	0.1907	0	None	No	0.0224	Param Inter
Cadmium (mg/L)	MW-2	0.000299	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	92.86	n/a	n/a	0.05925	NP Inter (NDs)
Cadmium (mg/L)	MW-3A	0.000299	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	92.86	n/a	n/a	0.05925	NP Inter (NDs)
Cadmium (mg/L)	MW-4	0.000299	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	92.86	n/a	n/a	0.05925	NP Inter (NDs)
Cadmium (mg/L)	MW-5	0.000299	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	92.86	n/a	n/a	0.05925	NP Inter (NDs)
Cadmium (mg/L)	MW-6	0.000299	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	92.86	n/a	n/a	0.05925	NP Inter (NDs)
Calcium (mg/L)	**MW-2**	**34.03**	**n/a**	**9/22/2020**	**157**	**Yes**	**15**	**MW-1**	**29.12**	**2.159**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-3A**	**34.03**	**n/a**	**9/22/2020**	**423**	**Yes**	**15**	**MW-1**	**29.12**	**2.159**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-4**	**34.03**	**n/a**	**9/22/2020**	**823**	**Yes**	**15**	**MW-1**	**29.12**	**2.159**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-5**	**34.03**	**n/a**	**9/22/2020**	**495**	**Yes**	**15**	**MW-1**	**29.12**	**2.159**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Calcium (mg/L)	**MW-6**	**34.03**	**n/a**	**9/22/2020**	**417**	**Yes**	**15**	**MW-1**	**29.12**	**2.159**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-2**	**8.76**	**n/a**	**9/22/2020**	**231**	**Yes**	**15**	**MW-1**	**6.129**	**1.156**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-3A**	**8.76**	**n/a**	**9/22/2020**	**1200**	**Yes**	**15**	**MW-1**	**6.129**	**1.156**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-4**	**8.76**	**n/a**	**9/22/2020**	**2030**	**Yes**	**15**	**MW-1**	**6.129**	**1.156**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-5**	**8.76**	**n/a**	**9/22/2020**	**1800**	**Yes**	**15**	**MW-1**	**6.129**	**1.156**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chloride (mg/L)	**MW-6**	**8.76**	**n/a**	**9/22/2020**	**286**	**Yes**	**15**	**MW-1**	**6.129**	**1.156**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Chromium (mg/L)	MW-2	0.00354	n/a	9/22/2020	0.0003ND	No	14	MW-1	n/a	n/a	64.29	n/a	n/a	0.05925	NP Inter (NDs)
Chromium (mg/L)	MW-3A	0.00354	n/a	9/22/2020	0.0006	No	14	MW-1	n/a	n/a	64.29	n/a	n/a	0.05925	NP Inter (NDs)
Chromium (mg/L)	MW-4	0.00354	n/a	9/22/2020	0.0003ND	No	14	MW-1	n/a	n/a	64.29	n/a	n/a	0.05925	NP Inter (NDs)
Chromium (mg/L)	MW-5	0.00354	n/a	9/22/2020	0.0008	No	14	MW-1	n/a	n/a	64.29	n/a	n/a	0.05925	NP Inter (NDs)
Chromium (mg/L)	MW-6	0.00354	n/a	9/22/2020	0.0006	No	14	MW-1	n/a	n/a	64.29	n/a	n/a	0.05925	NP Inter (NDs)

Table H3: 2020 Annual Monitoring Report, BREC Green Landfill, September 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Cobalt (mg/L)	MW-2	0.001597	n/a	9/22/2020	0.002ND	No	13	MW-1	0.0005576	0.0004471	23.08	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	**MW-3A**	**0.001597**	**n/a**	**9/22/2020**	**0.004**	**Yes**	**13**	**MW-1**	**0.0005576**	**0.0004471**	**23.08**	**Aitchison`s**	**No**	**0.0224**	**Param Inter**
Cobalt (mg/L)	MW-4	0.001597	n/a	9/22/2020	0.002ND	No	13	MW-1	0.0005576	0.0004471	23.08	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-5	0.001597	n/a	9/22/2020	0.002ND	No	13	MW-1	0.0005576	0.0004471	23.08	Aitchison`s	No	0.0224	Param Inter
Cobalt (mg/L)	MW-6	0.001597	n/a	9/22/2020	0.002ND	No	13	MW-1	0.0005576	0.0004471	23.08	Aitchison`s	No	0.0224	Param Inter
Fluoride (mg/L)	MW-2	0.6612	n/a	9/22/2020	0.3	No	14	MW-1	0.5519	0.04757	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-3A	0.6612	n/a	9/22/2020	0.4	No	14	MW-1	0.5519	0.04757	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-4	0.6612	n/a	9/22/2020	0.2	No	14	MW-1	0.5519	0.04757	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-5	0.6612	n/a	9/22/2020	0.2	No	14	MW-1	0.5519	0.04757	0	None	No	0.0224	Param Inter
Fluoride (mg/L)	MW-6	0.6612	n/a	9/22/2020	0.5	No	14	MW-1	0.5519	0.04757	0	None	No	0.0224	Param Inter
Lead (mg/L)	MW-2	0.000279	n/a	9/22/2020	0.00025ND	No	14	MW-1	n/a	n/a	57.14	n/a	n/a	0.05925	NP Inter (NDs)
Lead (mg/L)	MW-3A	0.000279	n/a	9/22/2020	0.00025ND	No	14	MW-1	n/a	n/a	57.14	n/a	n/a	0.05925	NP Inter (NDs)
Lead (mg/L)	MW-4	0.000279	n/a	9/22/2020	0.00025ND	No	14	MW-1	n/a	n/a	57.14	n/a	n/a	0.05925	NP Inter (NDs)
Lead (mg/L)	MW-5	0.000279	n/a	9/22/2020	0.00025ND	No	14	MW-1	n/a	n/a	57.14	n/a	n/a	0.05925	NP Inter (NDs)
Lead (mg/L)	MW-6	0.000279	n/a	9/22/2020	0.00025ND	No	14	MW-1	n/a	n/a	57.14	n/a	n/a	0.05925	NP Inter (NDs)
Lithium (mg/L)	MW-2	0.0387	n/a	9/22/2020	0.006	No	15	MW-1	0.03053	0.003587	13.33	None	No	0.0224	Param Inter
Lithium (mg/L)	**MW-3A**	**0.0387**	**n/a**	**9/22/2020**	**0.8**	**Yes**	**15**	**MW-1**	**0.03053**	**0.003587**	**13.33**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-4**	**0.0387**	**n/a**	**9/22/2020**	**1.73**	**Yes**	**15**	**MW-1**	**0.03053**	**0.003587**	**13.33**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-5**	**0.0387**	**n/a**	**9/22/2020**	**0.42**	**Yes**	**15**	**MW-1**	**0.03053**	**0.003587**	**13.33**	**None**	**No**	**0.0224**	**Param Inter**
Lithium (mg/L)	**MW-6**	**0.0387**	**n/a**	**9/22/2020**	**0.05**	**Yes**	**15**	**MW-1**	**0.03053**	**0.003587**	**13.33**	**None**	**No**	**0.0224**	**Param Inter**
Mercury (ug/L)	MW-2	0.2	n/a	9/22/2020	0.1ND	No	15	MW-1	n/a	n/a	100	n/a	n/a	0.05591	NP Inter (NDs)
Mercury (ug/L)	MW-3A	0.2	n/a	9/22/2020	0.1ND	No	15	MW-1	n/a	n/a	100	n/a	n/a	0.05591	NP Inter (NDs)
Mercury (ug/L)	**MW-4**	**0.2**	**n/a**	**9/22/2020**	**0.3**	**Yes**	**15**	**MW-1**	**n/a**	**n/a**	**100**	**n/a**	**n/a**	**0.05591**	**NP Inter (NDs)**
Mercury (ug/L)	MW-5	0.2	n/a	9/22/2020	0.1ND	No	15	MW-1	n/a	n/a	100	n/a	n/a	0.05591	NP Inter (NDs)
Mercury (ug/L)	MW-6	0.2	n/a	9/22/2020	0.1ND	No	15	MW-1	n/a	n/a	100	n/a	n/a	0.05591	NP Inter (NDs)
Molybdenum (mg/L)	MW-2	0.00245	n/a	9/22/2020	0.002	No	14	MW-1	0.0008551	0.0006941	35.71	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-3A	0.00245	n/a	9/22/2020	0.001ND	No	14	MW-1	0.0008551	0.0006941	35.71	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-4	0.00245	n/a	9/22/2020	0.001ND	No	14	MW-1	0.0008551	0.0006941	35.71	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-5	0.00245	n/a	9/22/2020	0.001ND	No	14	MW-1	0.0008551	0.0006941	35.71	Aitchison`s	No	0.0224	Param Inter
Molybdenum (mg/L)	MW-6	0.00245	n/a	9/22/2020	0.001ND	No	14	MW-1	0.0008551	0.0006941	35.71	Aitchison`s	No	0.0224	Param Inter
pH [Field] (SU)	**MW-2**	**7.829**	**6.76**	**9/22/2020**	**6.22**	**Yes**	**15**	**MW-1**	**7.295**	**0.2016**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-3A**	**7.829**	**6.76**	**9/22/2020**	**6.61**	**Yes**	**15**	**MW-1**	**7.295**	**0.2016**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-4**	**7.829**	**6.76**	**9/22/2020**	**6.64**	**Yes**	**15**	**MW-1**	**7.295**	**0.2016**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-5**	**7.829**	**6.76**	**9/22/2020**	**6.52**	**Yes**	**15**	**MW-1**	**7.295**	**0.2016**	**0**	**None**	**No**	**0.0112**	**Param Inter**
pH [Field] (SU)	**MW-6**	**7.829**	**6.76**	**9/22/2020**	**6.32**	**Yes**	**15**	**MW-1**	**7.295**	**0.2016**	**0**	**None**	**No**	**0.0112**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-2	1.772	n/a	9/22/2020	0.493	No	14	MW-1	-0.2162	0.343	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-3A	1.772	n/a	9/22/2020	1.51	No	14	MW-1	-0.2162	0.343	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-4	1.772	n/a	9/22/2020	0.877	No	14	MW-1	-0.2162	0.343	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-5	1.772	n/a	9/22/2020	1.68	No	14	MW-1	-0.2162	0.343	0	None	ln(x)	0.0224	Param Inter
Radium 226 + 228 (pCi/L)	MW-6	1.772	n/a	9/22/2020	0.38	No	14	MW-1	-0.2162	0.343	0	None	ln(x)	0.0224	Param Inter
Selenium (mg/L)	MW-2	0.00105	n/a	9/22/2020	0.0005ND	No	14	MW-1	n/a	n/a	85.71	n/a	n/a	0.05925	NP Inter (NDs)
Selenium (mg/L)	MW-3A	0.00105	n/a	9/22/2020	0.0005ND	No	14	MW-1	n/a	n/a	85.71	n/a	n/a	0.05925	NP Inter (NDs)
Selenium (mg/L)	MW-4	0.00105	n/a	9/22/2020	0.0005ND	No	14	MW-1	n/a	n/a	85.71	n/a	n/a	0.05925	NP Inter (NDs)
Selenium (mg/L)	MW-5	0.00105	n/a	9/22/2020	0.0005ND	No	14	MW-1	n/a	n/a	85.71	n/a	n/a	0.05925	NP Inter (NDs)
Selenium (mg/L)	MW-6	0.00105	n/a	9/22/2020	0.0005ND	No	14	MW-1	n/a	n/a	85.71	n/a	n/a	0.05925	NP Inter (NDs)

Table H3: 2020 Annual Monitoring Report, BREC Green Landfill, September 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Sulfate (mg/L)	**MW-2**	**29.87**	**n/a**	**9/22/2020**	**117**	**Yes**	**15**	**MW-1**	**23.79**	**2.673**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-3A**	**29.87**	**n/a**	**9/22/2020**	**1830**	**Yes**	**15**	**MW-1**	**23.79**	**2.673**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-4**	**29.87**	**n/a**	**9/22/2020**	**2080**	**Yes**	**15**	**MW-1**	**23.79**	**2.673**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-5**	**29.87**	**n/a**	**9/22/2020**	**973**	**Yes**	**15**	**MW-1**	**23.79**	**2.673**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Sulfate (mg/L)	**MW-6**	**29.87**	**n/a**	**9/22/2020**	**2380**	**Yes**	**15**	**MW-1**	**23.79**	**2.673**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Thallium (mg/L)	MW-2	0.000498	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	50	n/a	n/a	0.05925	NP Inter
Thallium (mg/L)	MW-3A	0.000498	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	50	n/a	n/a	0.05925	NP Inter
Thallium (mg/L)	MW-4	0.000498	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	50	n/a	n/a	0.05925	NP Inter
Thallium (mg/L)	MW-5	0.000498	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	50	n/a	n/a	0.05925	NP Inter
Thallium (mg/L)	MW-6	0.000498	n/a	9/22/2020	0.00005ND	No	14	MW-1	n/a	n/a	50	n/a	n/a	0.05925	NP Inter
Total Dissolved Solids (mg/L)	**MW-2**	**654.6**	**n/a**	**9/22/2020**	**914**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-3A**	**654.6**	**n/a**	**9/22/2020**	**5680**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-4**	**654.6**	**n/a**	**9/22/2020**	**4470**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-5**	**654.6**	**n/a**	**9/22/2020**	**5170**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-6**	**654.6**	**n/a**	**9/22/2020**	**4740**	**Yes**	**13**	**MW-1**	**604.7**	**21.48**	**0**	**None**	**No**	**0.0224**	**Param Inter**

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Inter - Parametric interstation prediction limit
n/a - not applicable
ND - Compound not detected, preceding number is one-half the reporting limit.
NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.
NDs - background data contain too high a percentage of non-detect values.
Param - Parametric Prediction Limit

Table H4: 2020 Annual Monitoring Report, GREC Green Landfill, Comparison of 95% LCL to GWPS

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
Arsenic (mg/L)	MW-2	0.01753	0.008321	0.01	No	14	0.01619	0.01345	0	None	ln(x)	0.05	Param.
Barium (mg/L)	MW-2	0.362	0.238	2	No	14	0.2969	0.07491	0	None	No	0.05	NP (selected)
Lithium (mg/L)	**MW-3A**	**0.766**	**0.677**	**0.04**	**Yes**	**14**	**0.7055**	**0.07319**	**0**	**None**	**No**	**0.05**	**NP (selected)**
Lithium (mg/L)	**MW-4**	**1.77**	**1.13**	**0.04**	**Yes**	**14**	**1.363**	**0.5239**	**7.143**	**None**	**No**	**0.05**	**NP (selected)**
Lithium (mg/L)	**MW-5**	**0.4302**	**0.3423**	**0.04**	**Yes**	**14**	**0.3862**	**0.09283**	**0**	**None**	**No**	**0.05**	**Param.**
Lithium (mg/L)	**MW-6**	**0.06026**	**0.05385**	**0.04**	**Yes**	**14**	**0.05706**	**0.006777**	**0**	**None**	**No**	**0.05**	**Param.**
Mercury (ug/L)	MW-4	0.824	0.27	2	No	14	0.5087	0.2606	0	None	No	0.05	NP (selected)
Selenium (mg/L)	MW-4	0.1222	0.00535	0.05	No	13	0.00333	0.006309	38.46	Aitchison`s	ln(x)	0.05	Param.

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Normal and field duplicate samples averaged, where applicable
NP - Non-parametric Confidence Limit
Param - Parametric Confidence Limit

Table H5: 2020 Annual Monitoring Report, GREC Green Landfill, Comparison of 95% LCL to GWPS

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
Arsenic (mg/L)	MW-2	0.0168	0.008409	0.05	No	15	0.01574	0.01308	0	None	ln(x)	0.05	Param.
Barium (mg/L)	MW-2	0.362	0.238	2	No	15	0.2995	0.07289	0	None	No	0.05	NP (selected)
Cobalt (mg/L)	MW-3A	0.001412	0.000266	0.006	No	14	0.001754	0.002229	14.29	None	ln(x)	0.05	Param.
Lithium (mg/L)	**MW-3A**	**0.767**	**0.677**	**0.04**	**Yes**	**15**	**0.7118**	**0.07463**	**0**	**None**	**No**	**0.05**	**NP (selected)**
Lithium (mg/L)	**MW-4**	**1.77**	**1.13**	**0.04**	**Yes**	**15**	**1.388**	**0.5136**	**6.667**	**None**	**No**	**0.05**	**NP (selected)**
Lithium (mg/L)	**MW-5**	**0.4293**	**0.3476**	**0.04**	**Yes**	**15**	**0.3885**	**0.08988**	**0**	**None**	**No**	**0.05**	**Param.**
Lithium (mg/L)	**MW-6**	**0.05967**	**0.0535**	**0.04**	**Yes**	**15**	**0.05659**	**0.00678**	**0**	**None**	**No**	**0.05**	**Param.**
Mercury (ug/L)	MW-4	0.824	0.27	2	No	15	0.4948	0.2569	0	None	No	0.05	NP (selected)

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
NP - Non-parametric Confidence Limit
Param - Parametric Confidence Limit

Figure

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

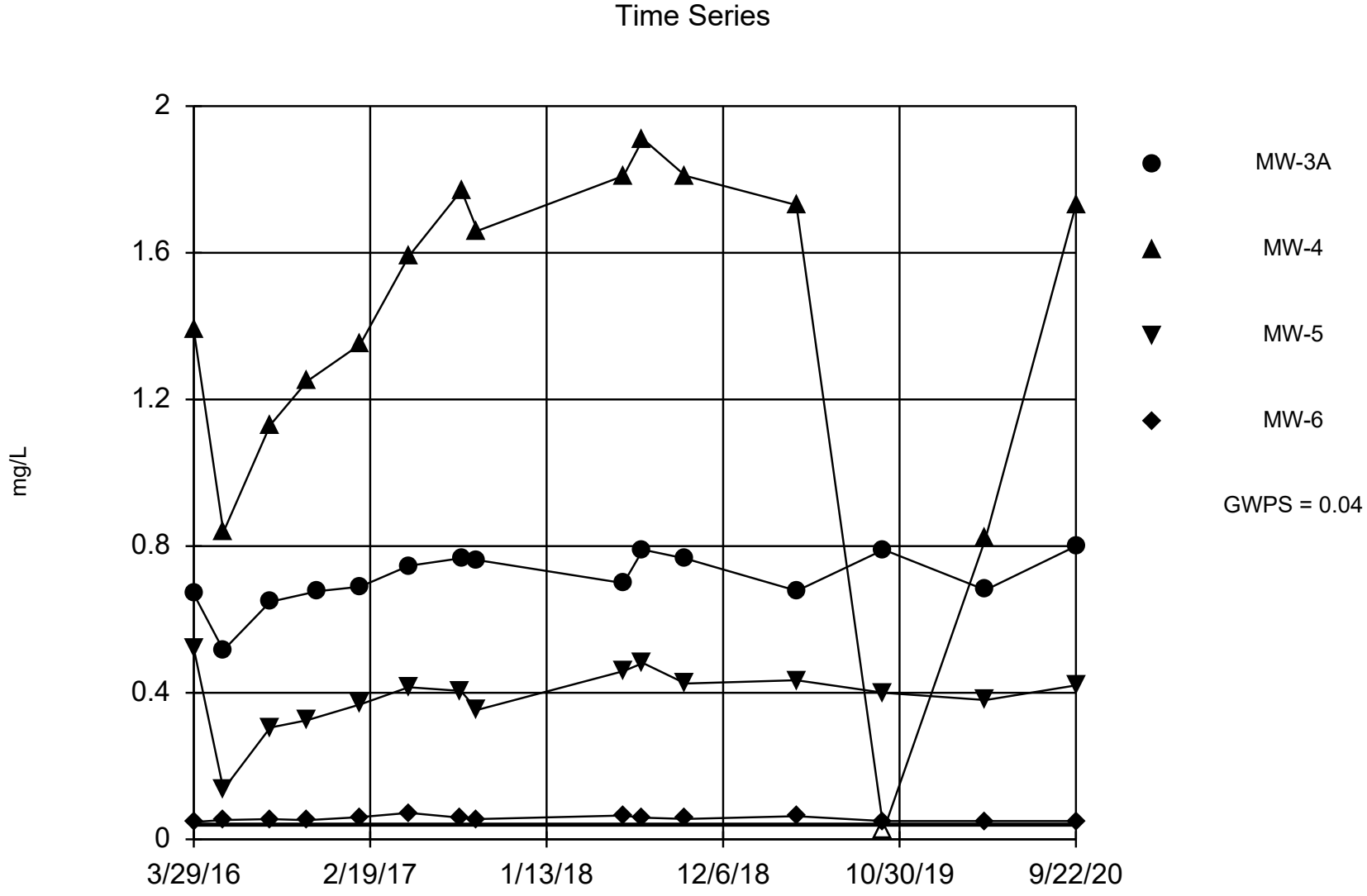


Figure H1

Constituent: Lithium Analysis Run 12/10/2020 3:45 PM

Facility: BREC Green LF Data File: Green LF All Data

Attachment 1

April 2020 Time Series Plots

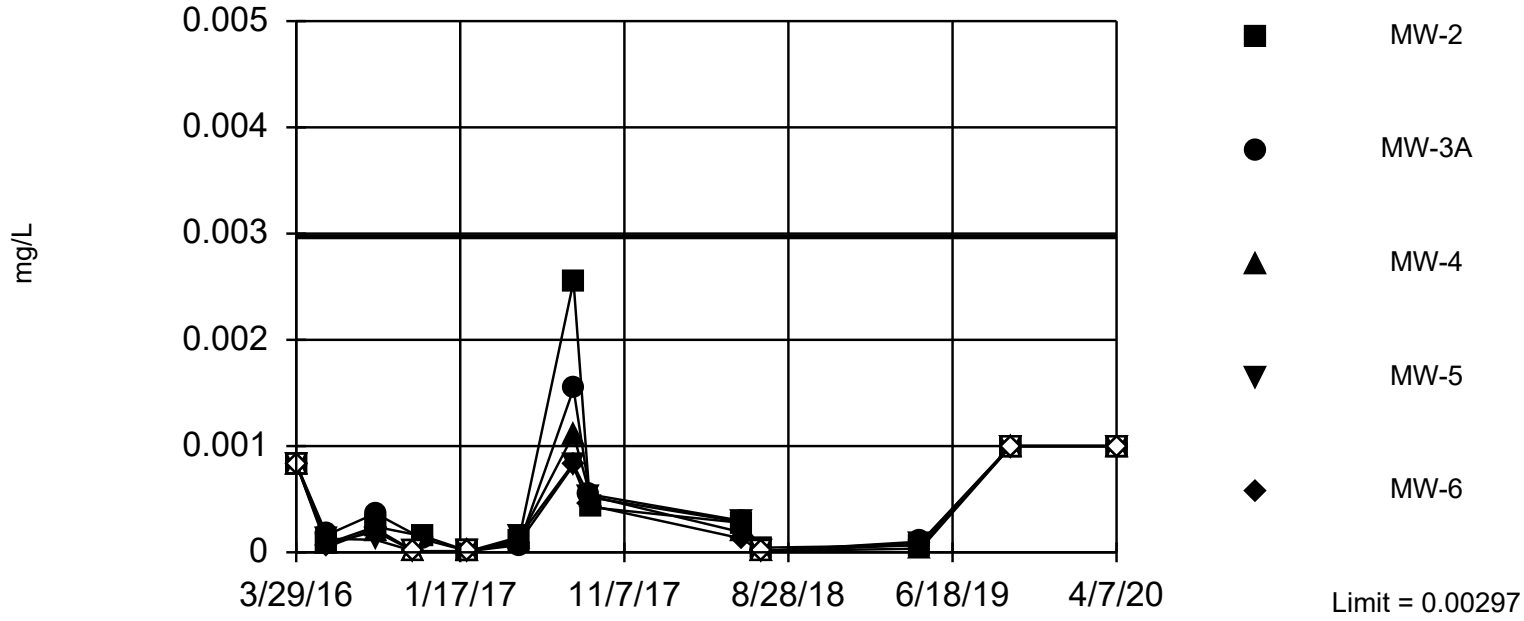
and Prediction Limit Results

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 103.2, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 13 background values. 38.46% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Antimony Analysis Run 12/8/2020 10:44 AM

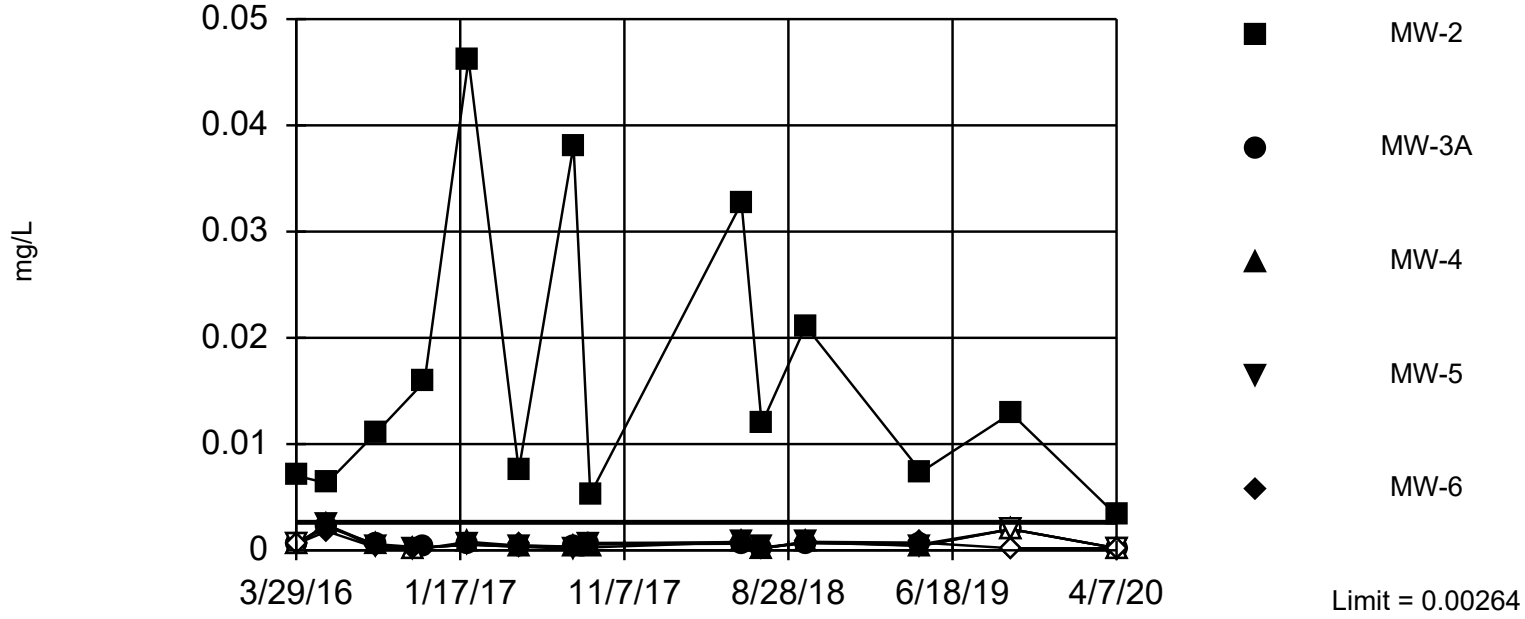
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-2

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 14 background values. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

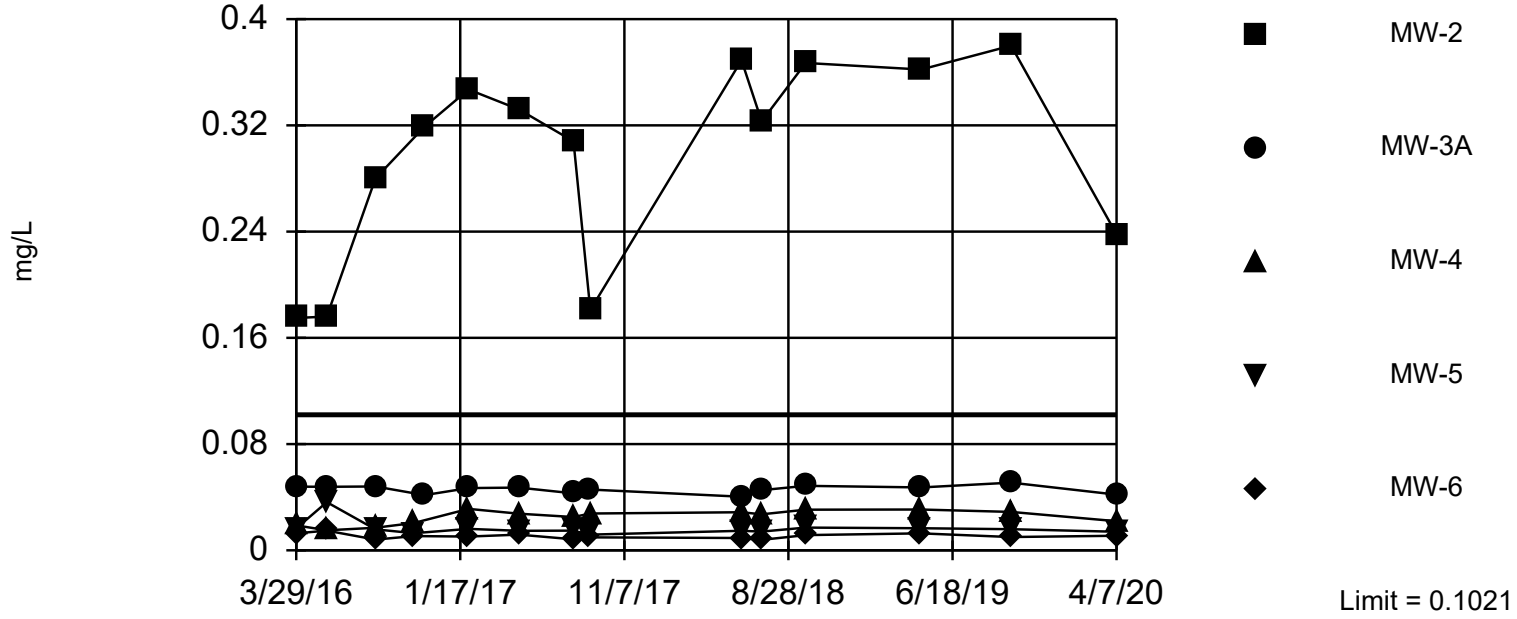
Constituent: Arsenic Analysis Run 12/8/2020 11:05 AM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.08257, Std. Dev.=0.008486, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 12/8/2020 11:09 AM

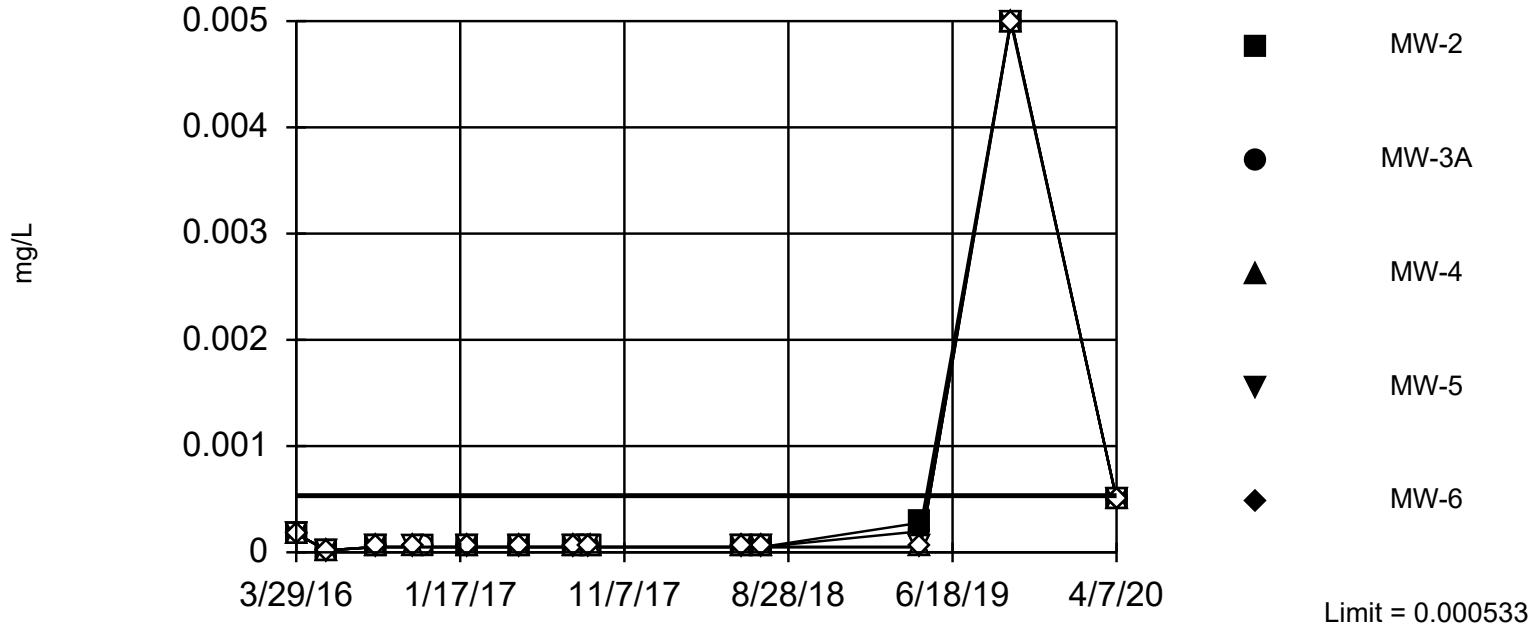
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.2941. Individual comparison alpha = 0.06729. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <0.01 (9/30/2019).

Constituent: Beryllium Analysis Run 12/8/2020 11:36 AM

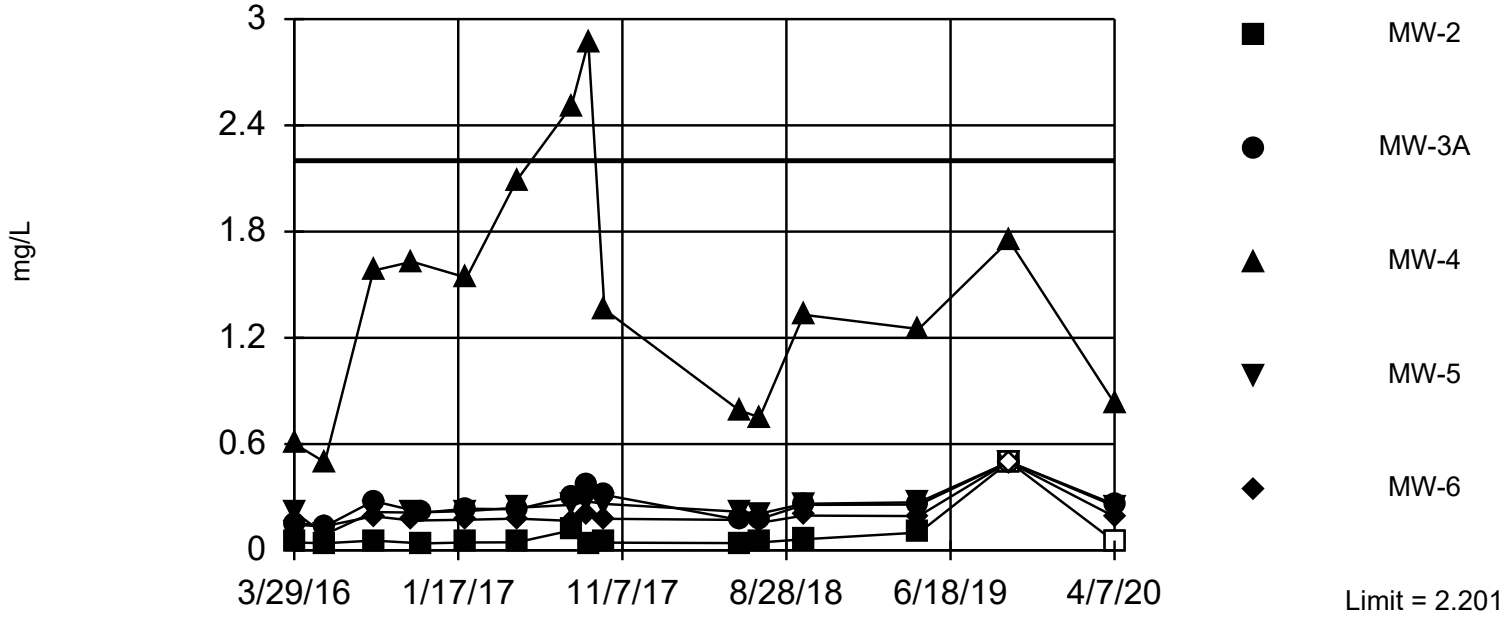
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.755, Std. Dev.=0.1959, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Boron Analysis Run 12/8/2020 9:11 AM

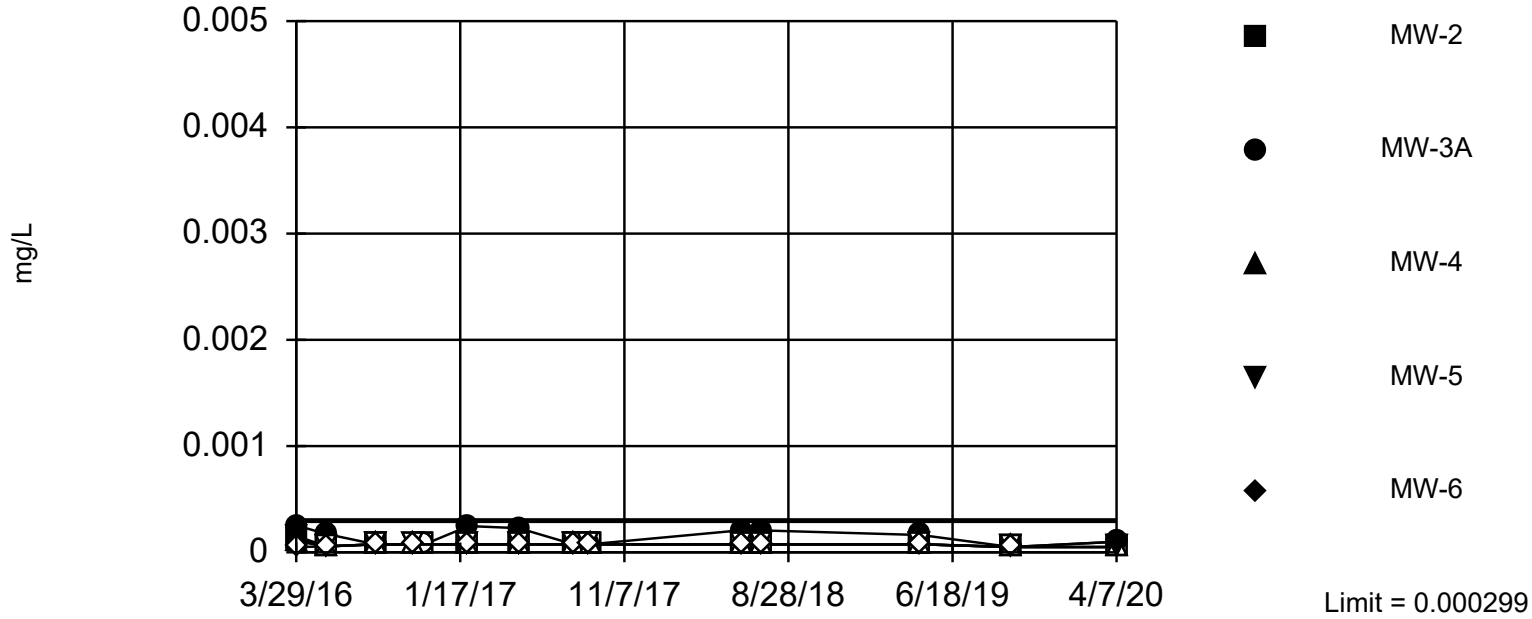
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 92.31% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit.

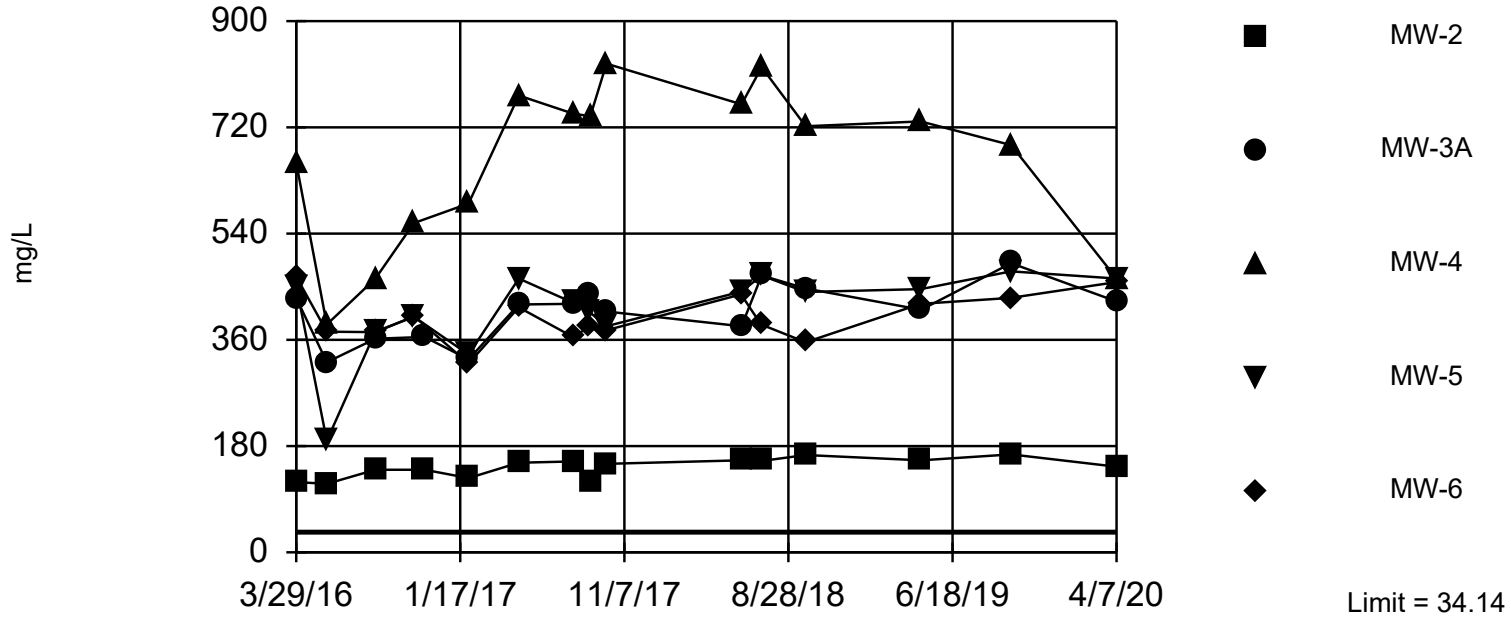
Constituent: Cadmium Analysis Run 12/8/2020 11:42 AM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=29.31, Std. Dev.=2.1, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 20.8 (2/1/2017).

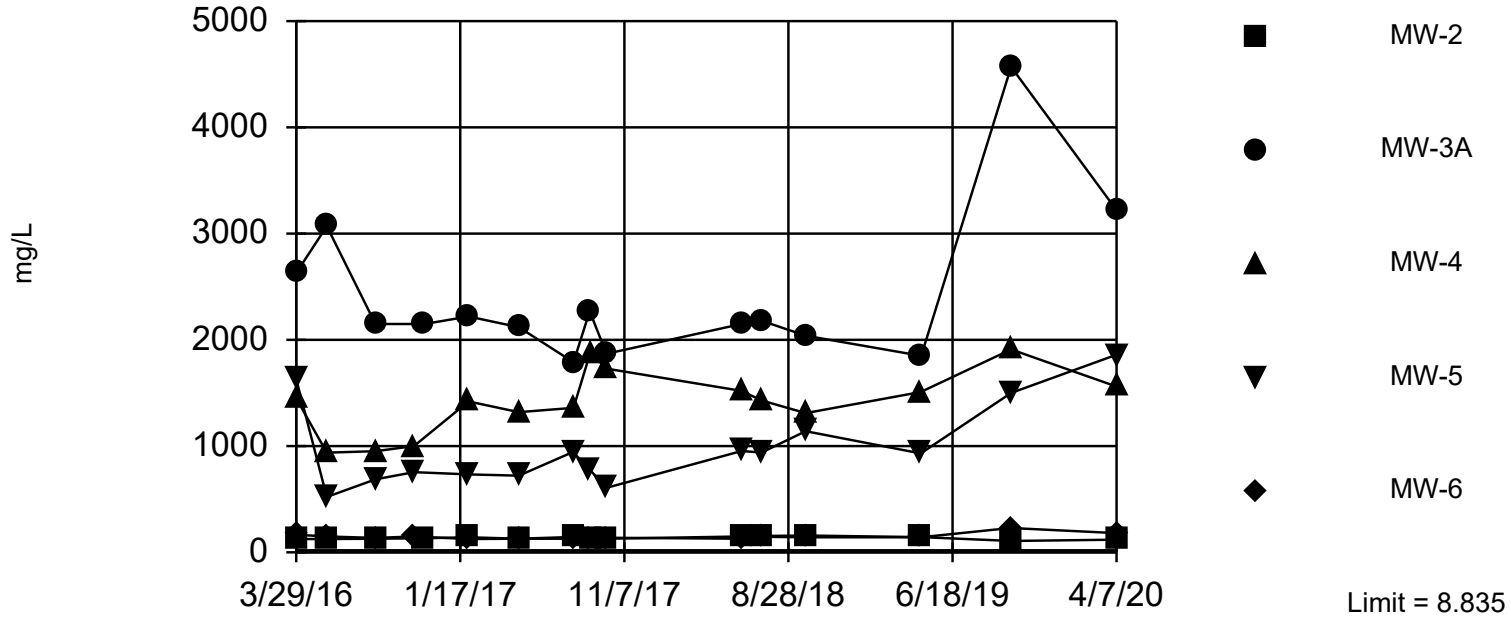
Constituent: Calcium Analysis Run 12/8/2020 9:15 AM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.096, Std. Dev.=1.192, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 0.501 (5/23/2016).

Constituent: Chloride Analysis Run 12/8/2020 10:09 AM

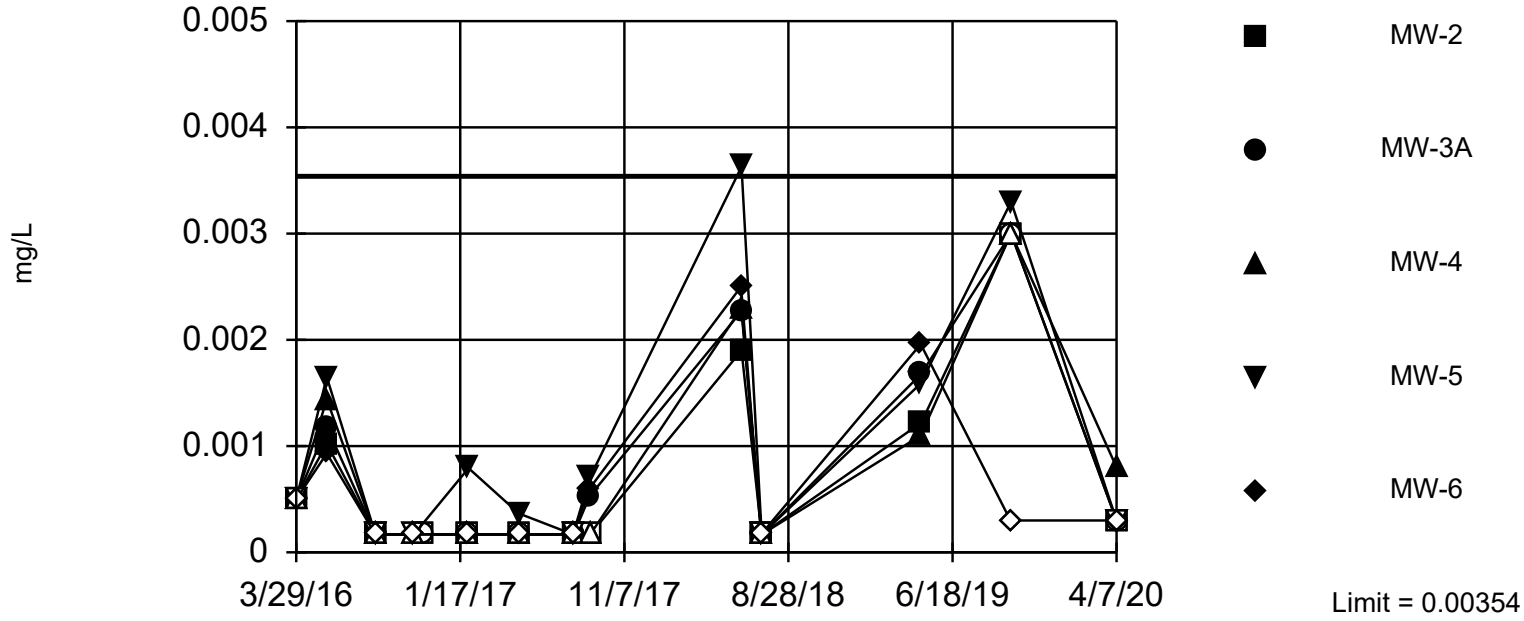
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 61.54% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Chromium Analysis Run 12/8/2020 11:46 AM

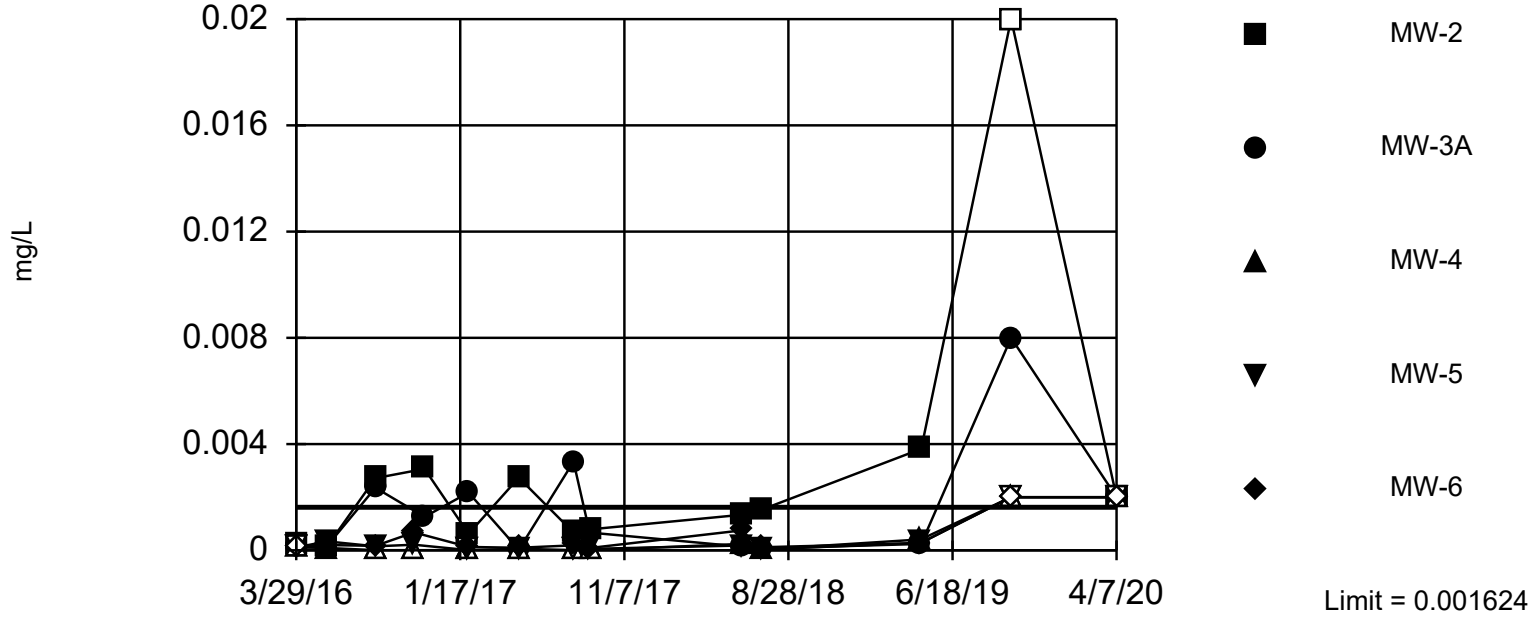
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0006041, Std. Dev.=0.0004329, n=12, 16.67% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.4E-05 (7/10/2018).

Constituent: Cobalt Analysis Run 12/8/2020 11:52 AM

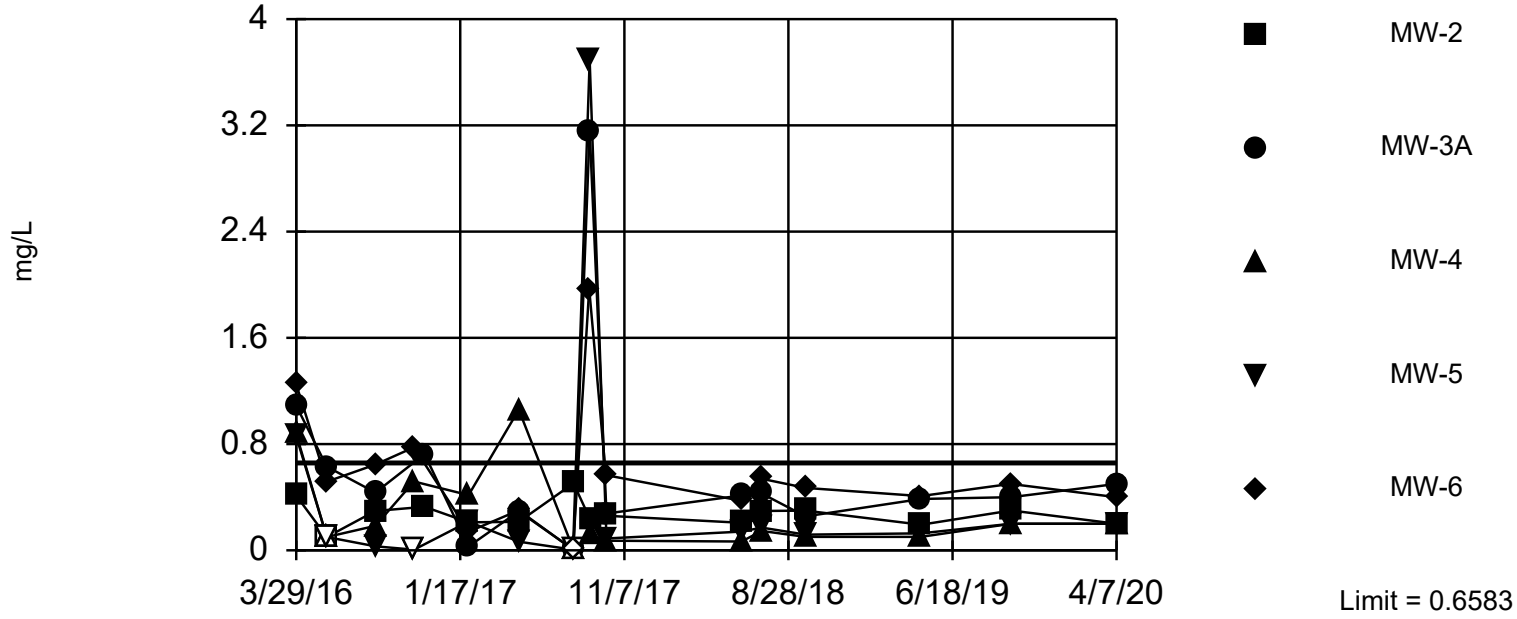
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.5482, Std. Dev.=0.04737, n=13. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 0.888 (3/29/2016); 0.0204 (5/23/2016).

Constituent: Fluoride Analysis Run 12/8/2020 10:17 AM

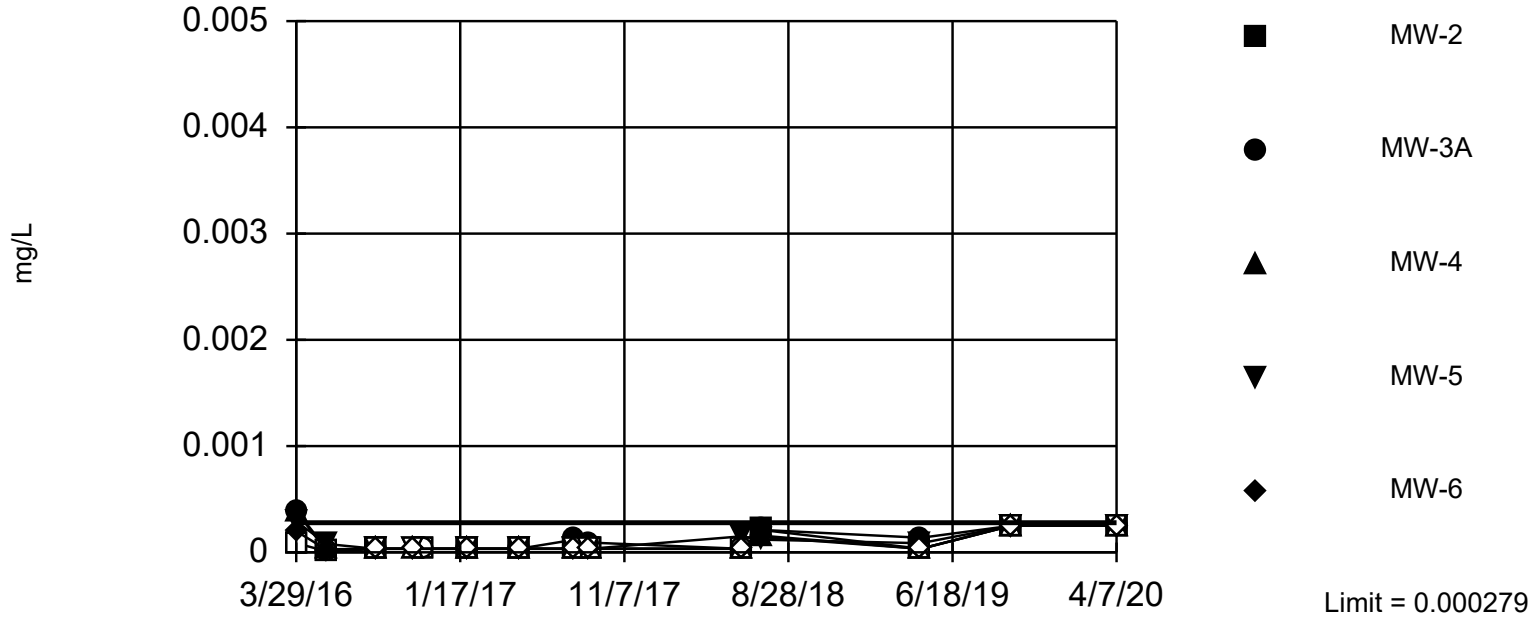
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 53.85% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lead Analysis Run 12/8/2020 11:54 AM

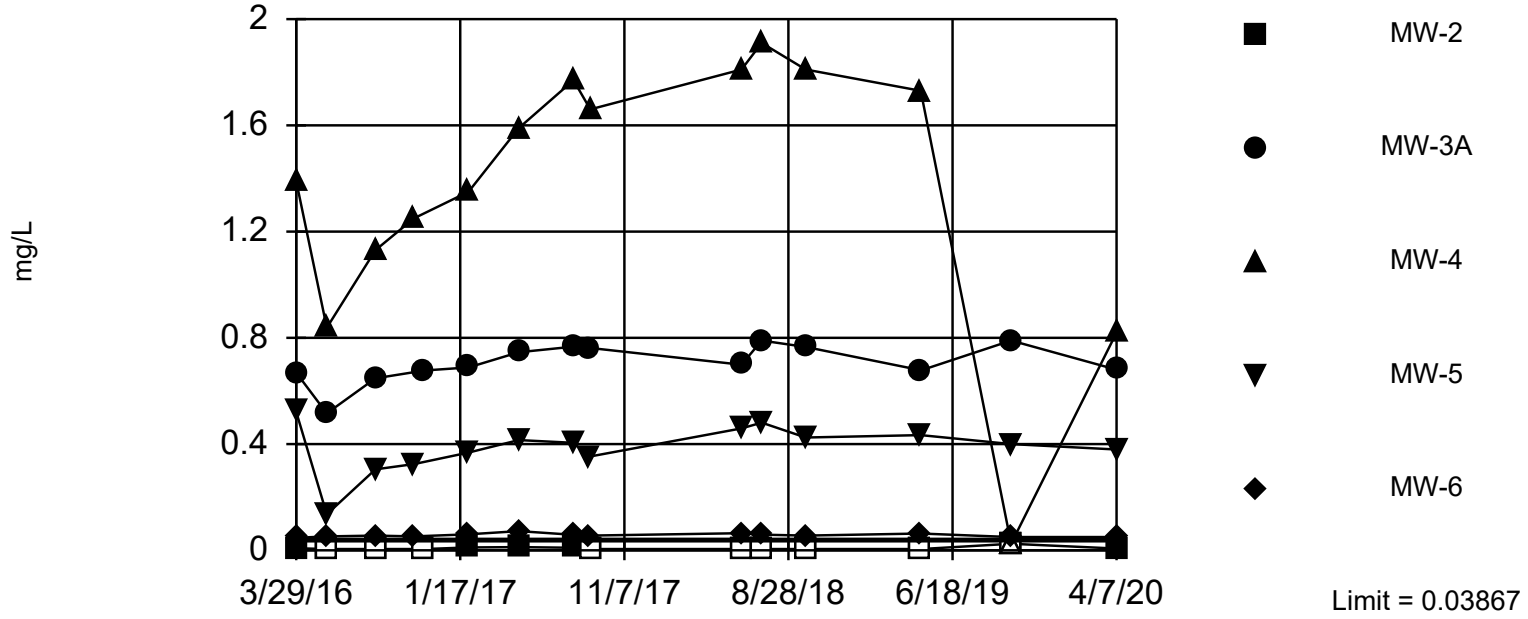
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.03093, Std. Dev.=0.003367, n=14, 7.143% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit.

Constituent: Lithium Analysis Run 12/8/2020 12:03 PM

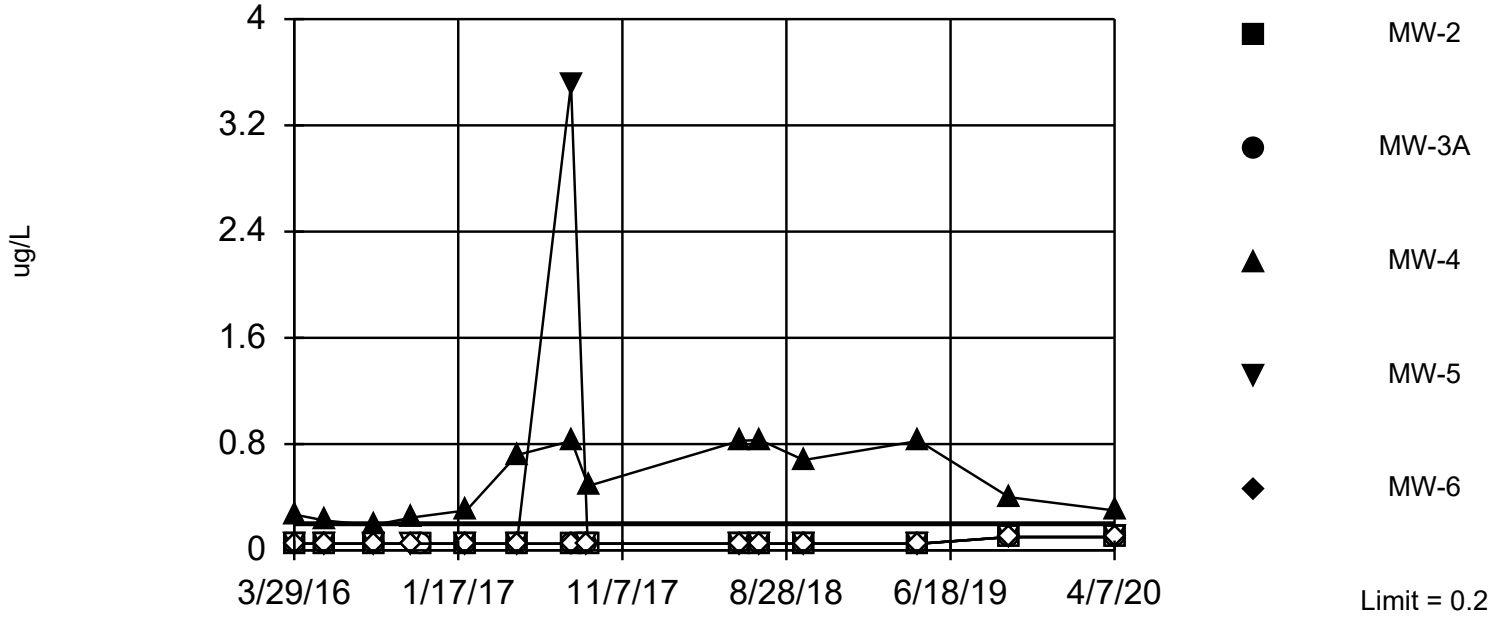
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-4

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 14) were censored; limit is most recent reporting limit. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Mercury Analysis Run 12/8/2020 12:09 PM

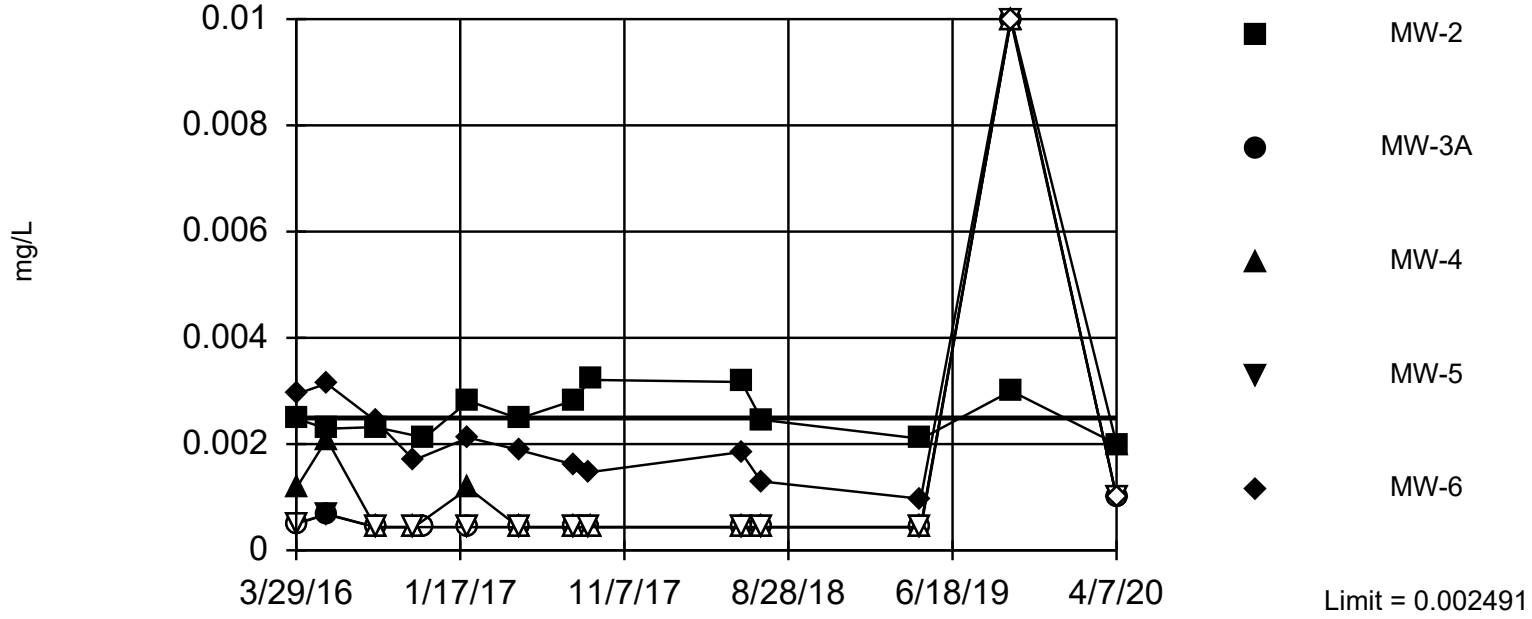
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0009209, Std. Dev.=0.0006755, n=13, 30.77% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

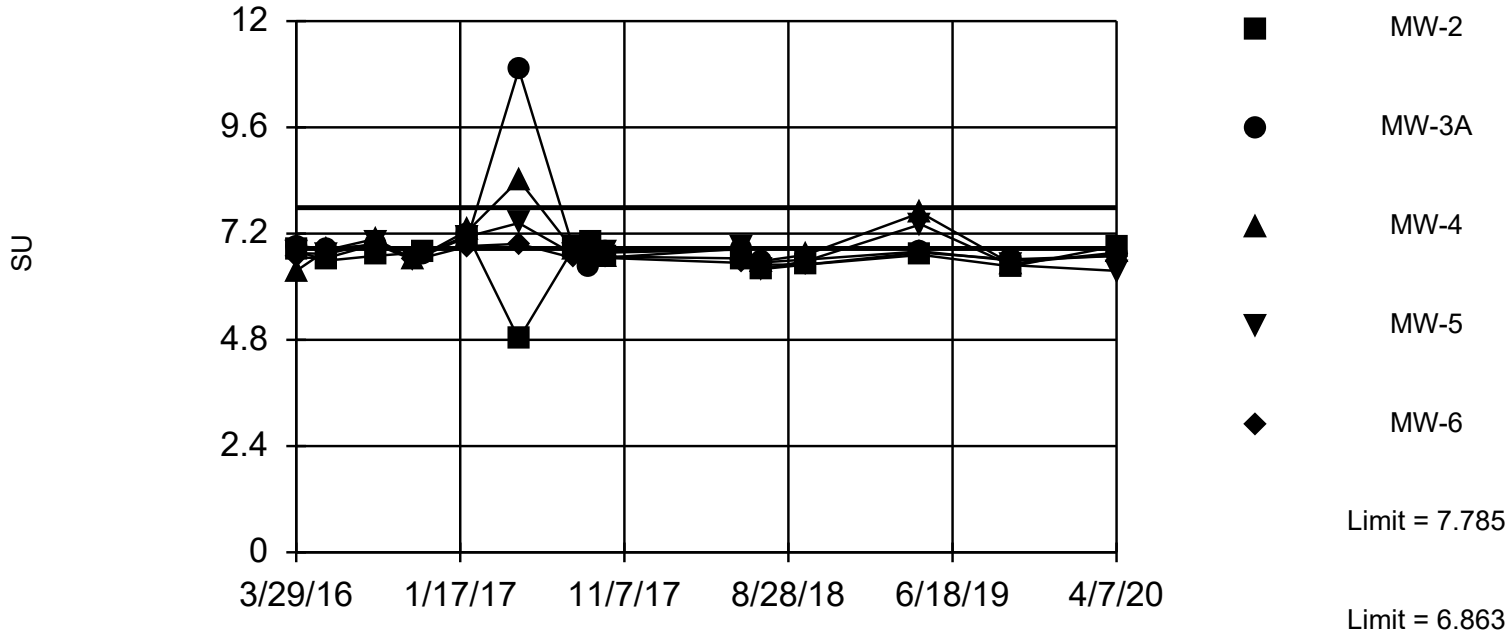
Constituent: Molybdenum Analysis Run 12/8/2020 12:12 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limits: MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=7.324, Std. Dev.=0.172, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0112. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.86 (5/2/2017).

Constituent: pH [Field] Analysis Run 12/8/2020 10:25 AM

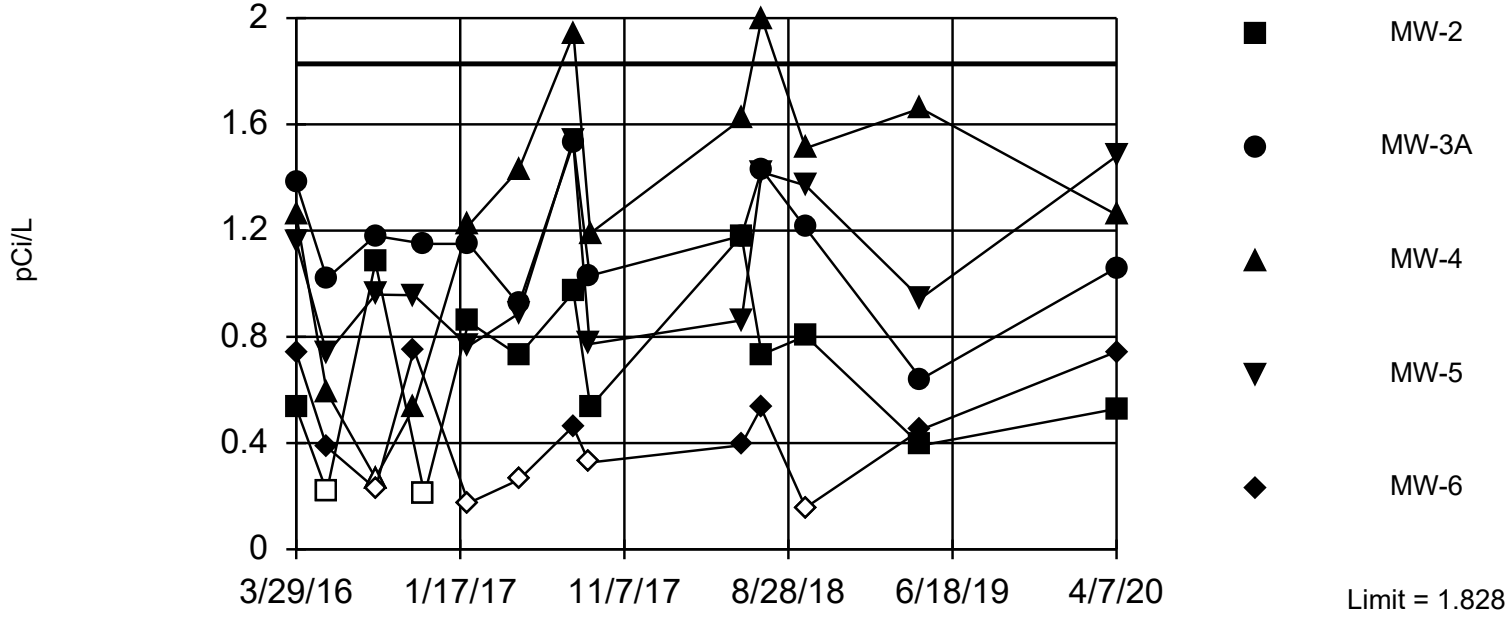
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-0.1888, Std. Dev.=0.3407, n=13. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit.

Constituent: Radium 226 + 228 Analysis Run 12/9/2020 10:21 AM

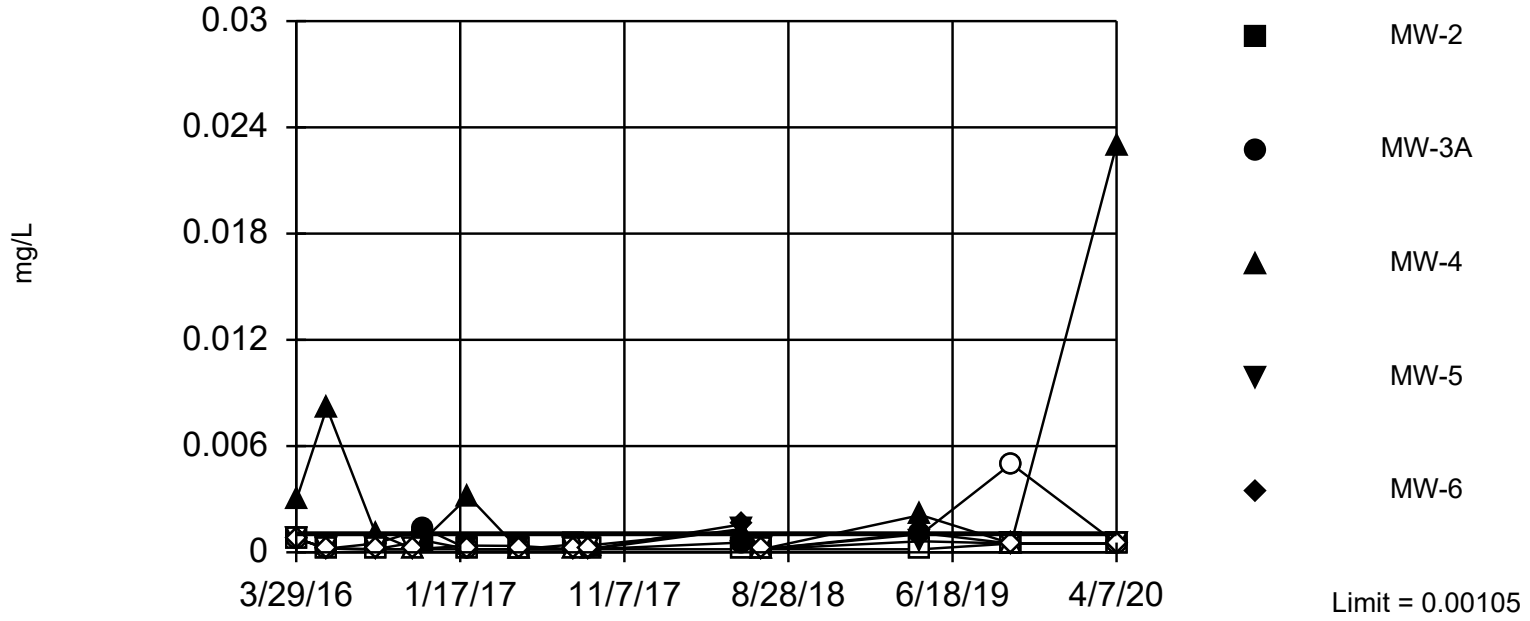
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

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 13 background values. 84.62% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

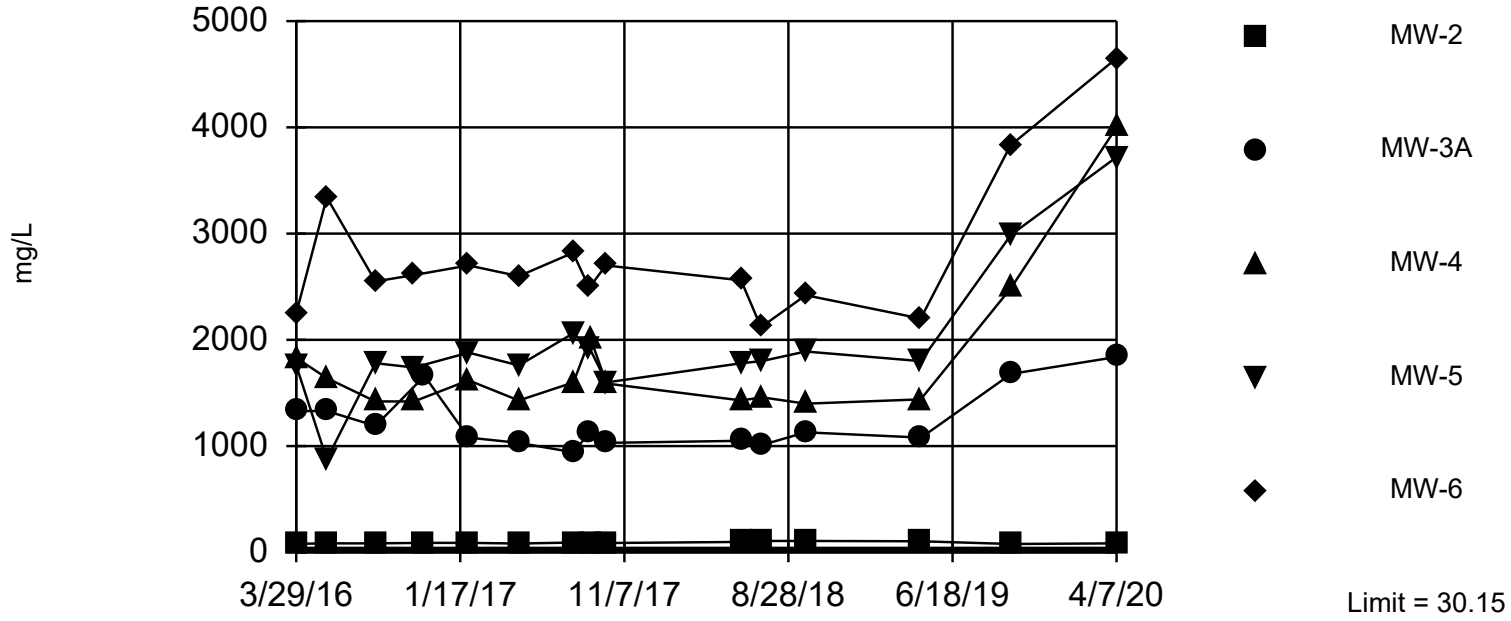
Constituent: Selenium Analysis Run 12/8/2020 1:00 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=23.77, Std. Dev.=2.774, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 35.1 (4/22/2019).

Constituent: Sulfate Analysis Run 12/8/2020 10:30 AM

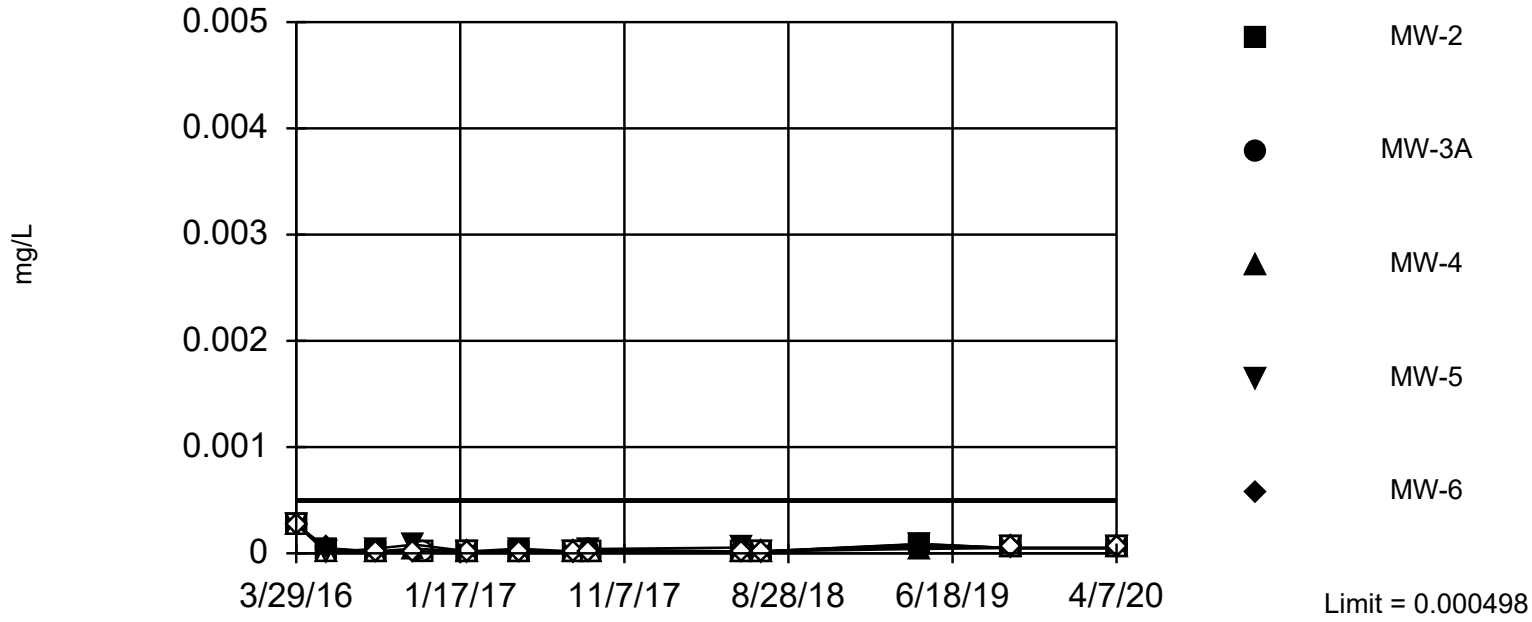
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 13 background values. 53.85% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

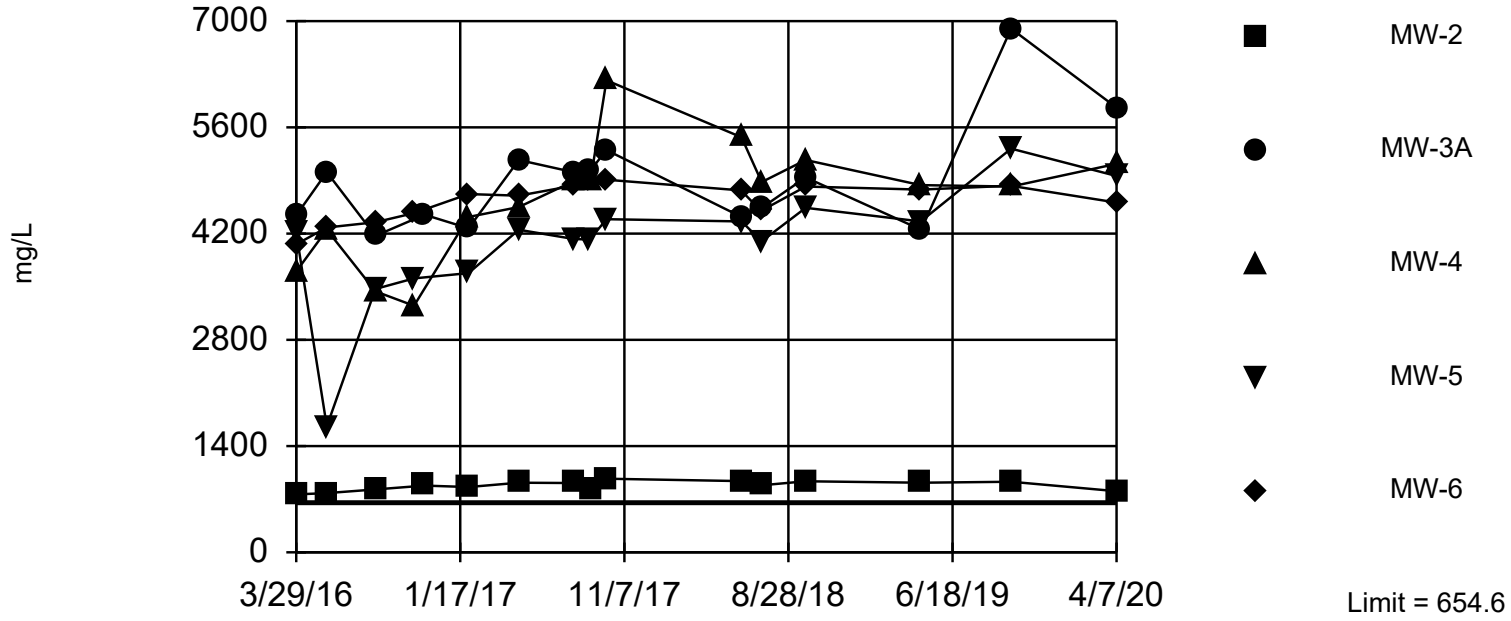
Constituent: Thallium Analysis Run 12/8/2020 1:04 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=604.7, Std. Dev.=21.48, n=13. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 444 (9/30/2019); 488 (4/6/2020).

Constituent: Total Dissolved Solids Analysis Run 12/8/2020 10:40 AM

Facility: BREC Green LF Data File: Green LF All Data

Attachment 2

September 2020 Time Series Plots

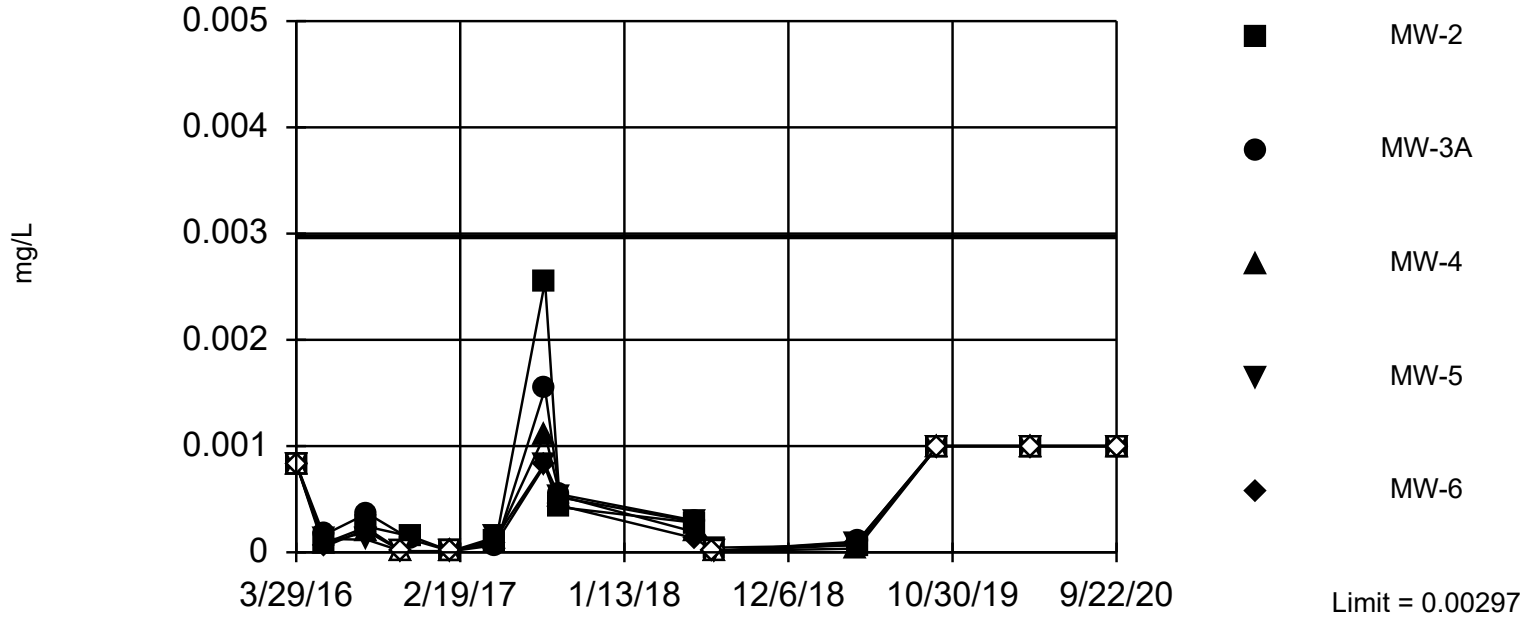
and Prediction Limit Results

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 147.5, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 14 background values. 42.86% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Antimony Analysis Run 12/7/2020 2:23 PM

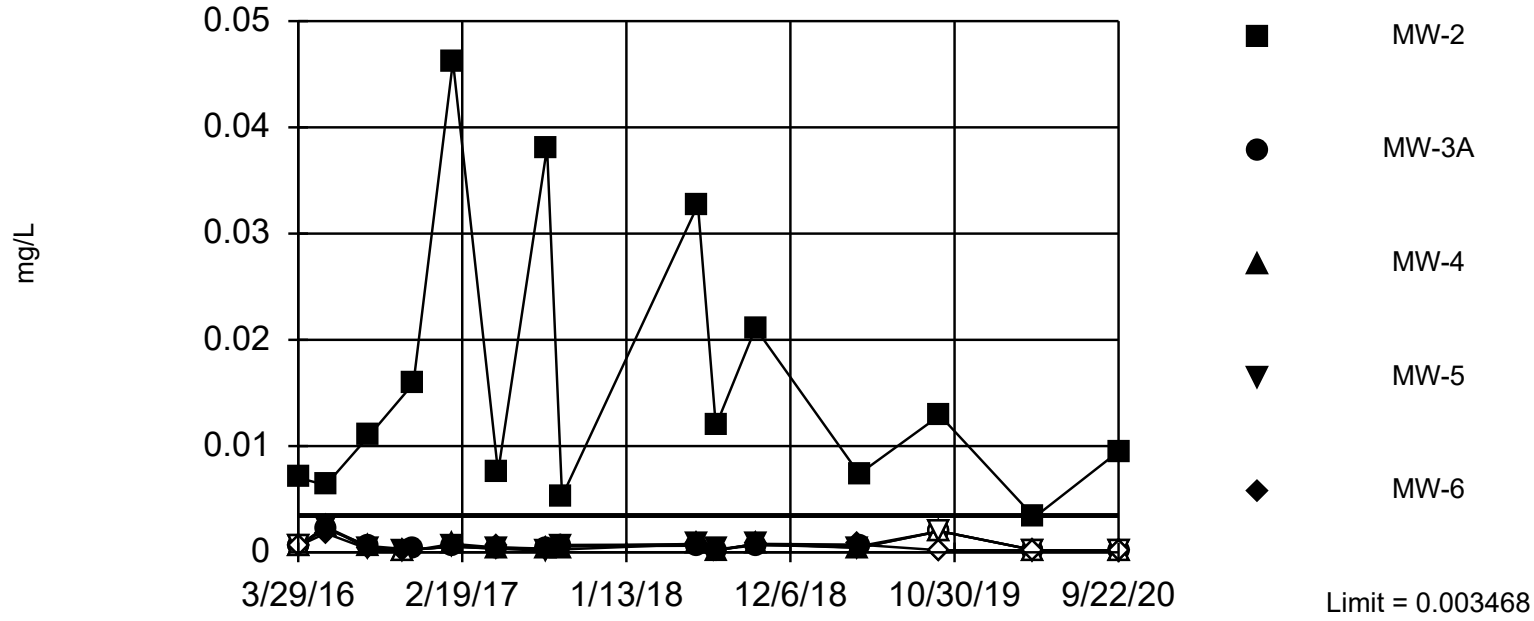
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-2

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-7.199, Std. Dev.=0.6746, n=15, 6.667% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

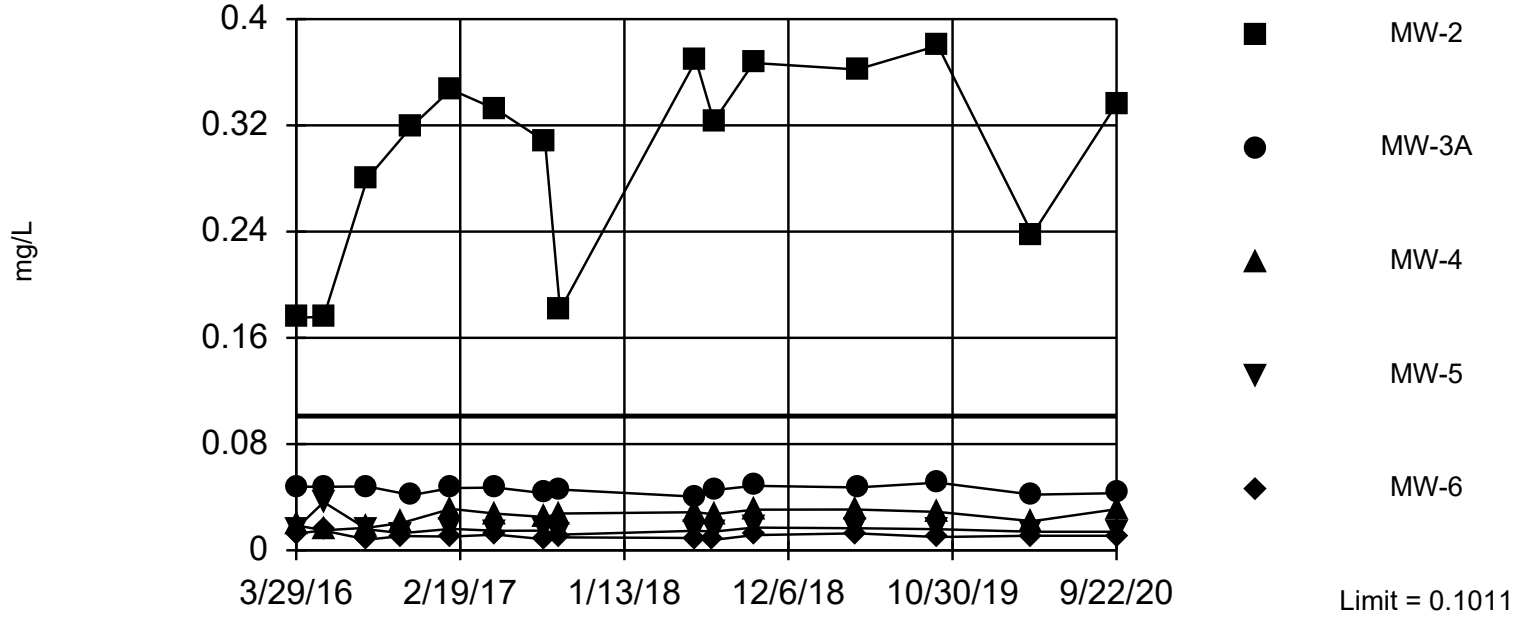
Constituent: Arsenic Analysis Run 12/7/2020 2:36 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.0822, Std. Dev.=0.008303, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 12/7/2020 2:40 PM

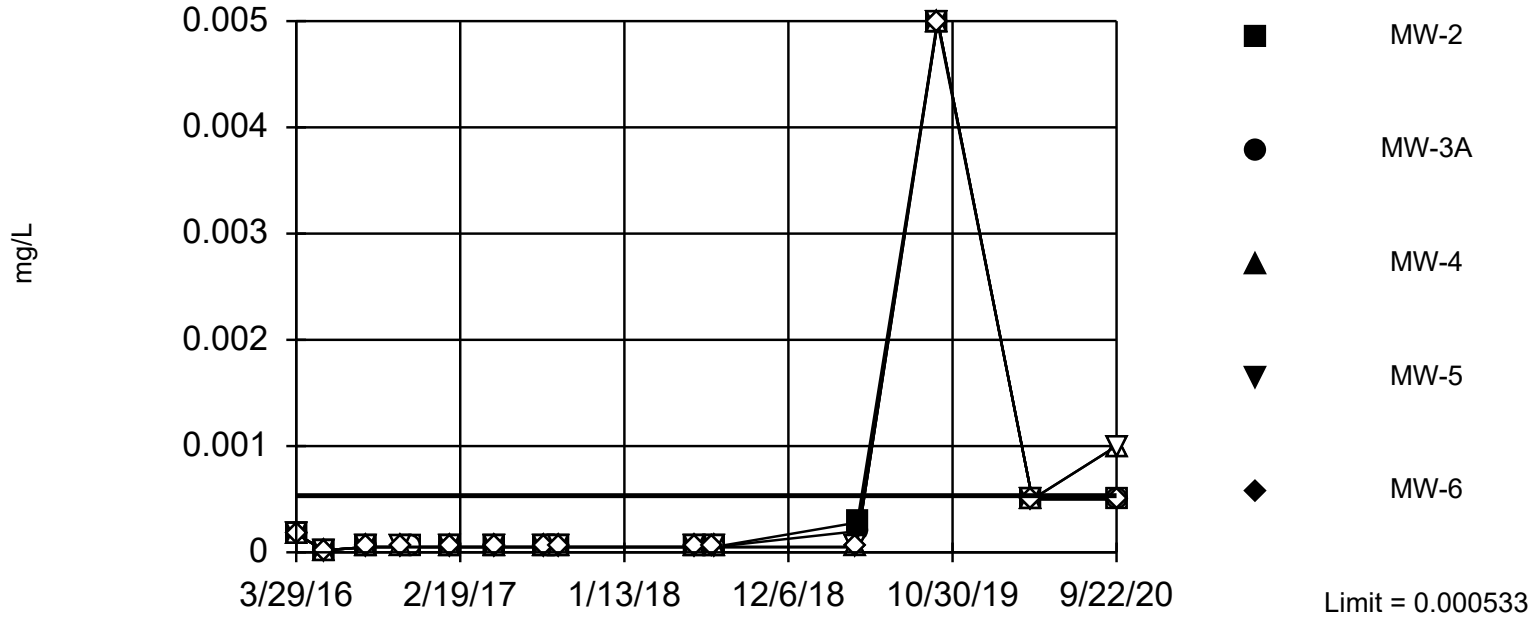
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 92.31% NDs. Report alpha = 0.2778. Individual comparison alpha = 0.06301. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <0.01 (9/30/2019).

Constituent: Beryllium Analysis Run 12/7/2020 2:42 PM

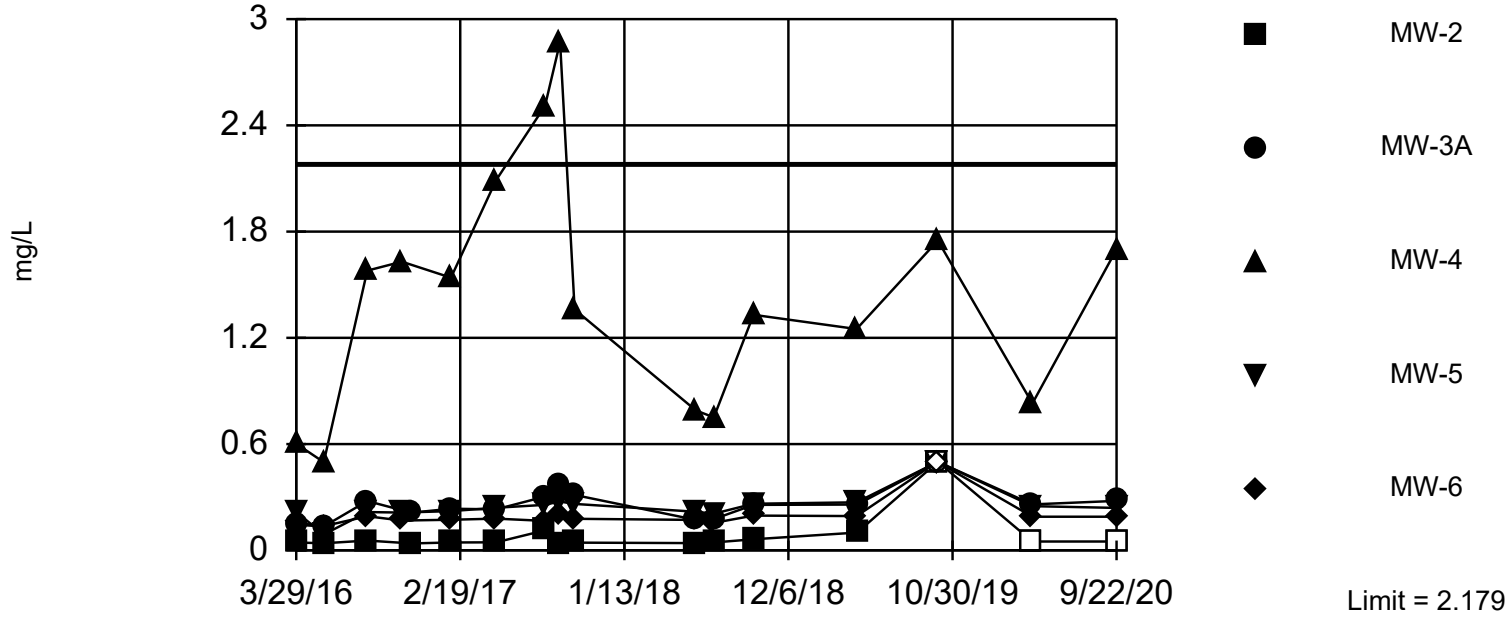
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1.749, Std. Dev.=0.1907, n=16. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Boron Analysis Run 12/7/2020 1:29 PM

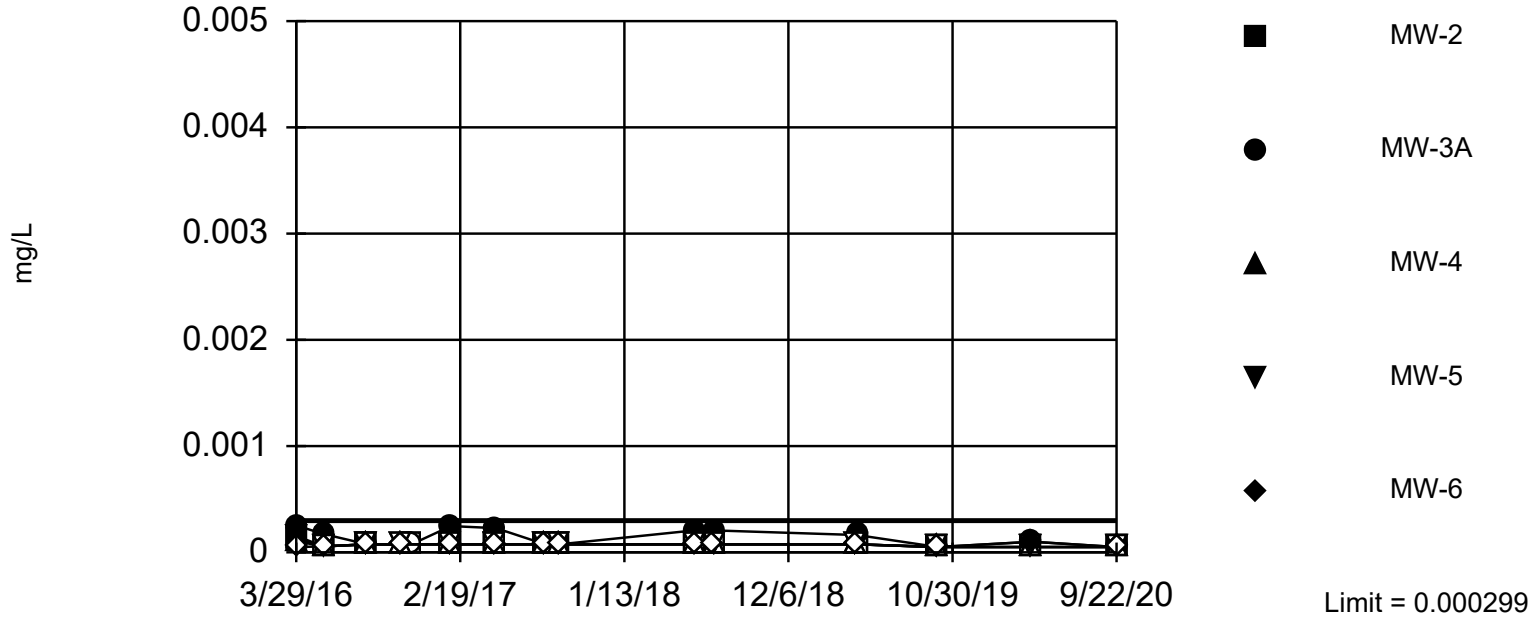
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 92.86% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit.

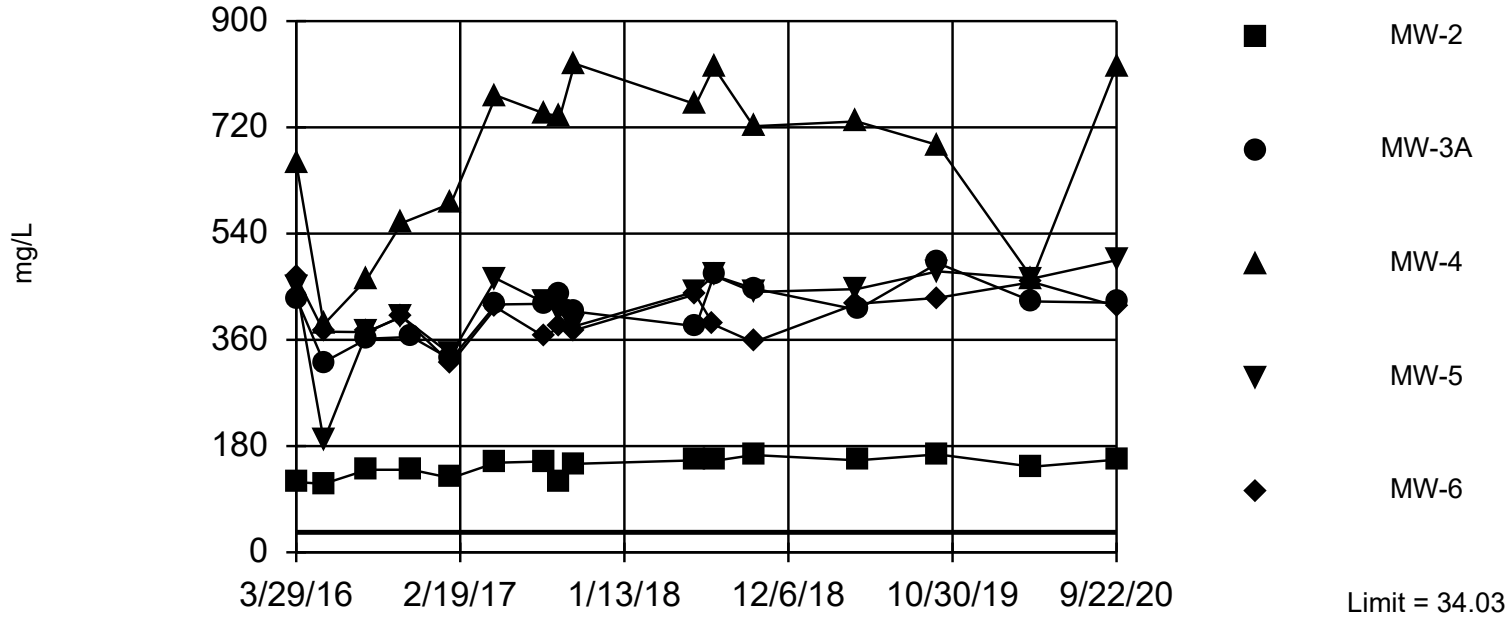
Constituent: Cadmium Analysis Run 12/7/2020 2:53 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=29.12, Std. Dev.=2.159, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 20.8 (2/1/2017).

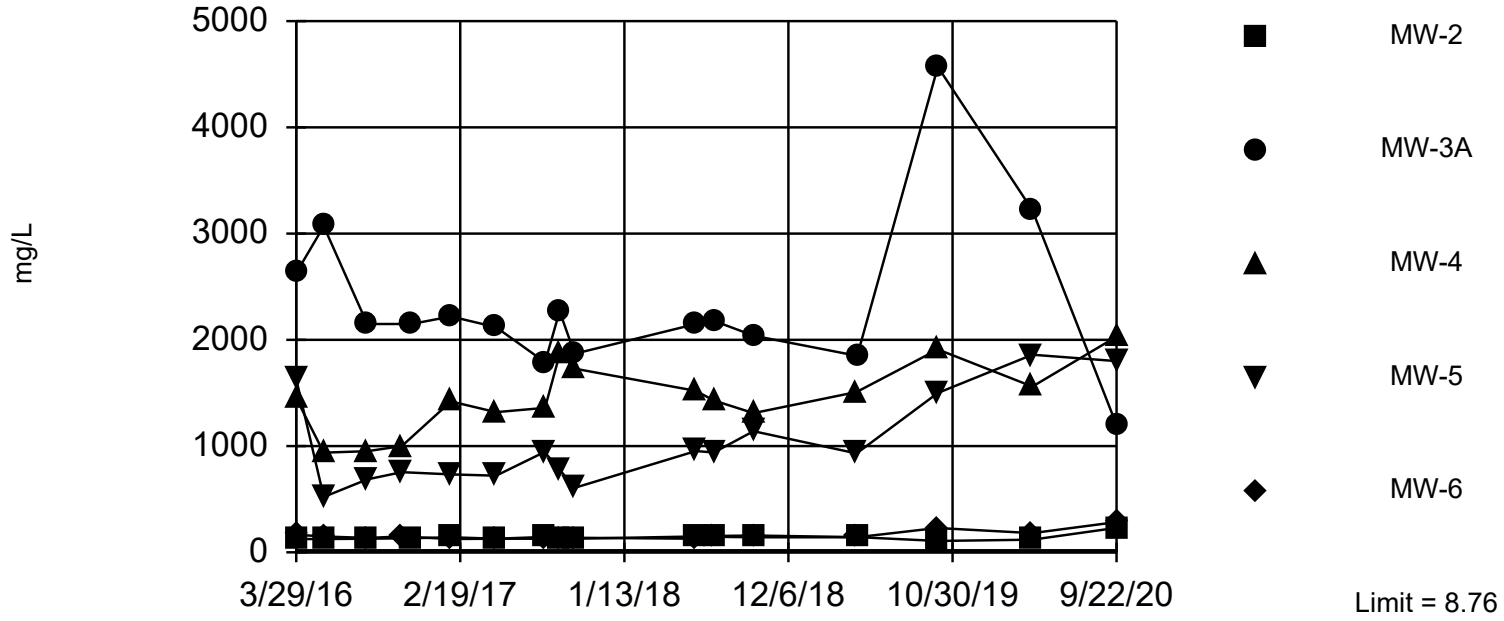
Constituent: Calcium Analysis Run 12/7/2020 1:32 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.129, Std. Dev.=1.156, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 0.501 (5/23/2016).

Constituent: Chloride Analysis Run 12/7/2020 1:46 PM

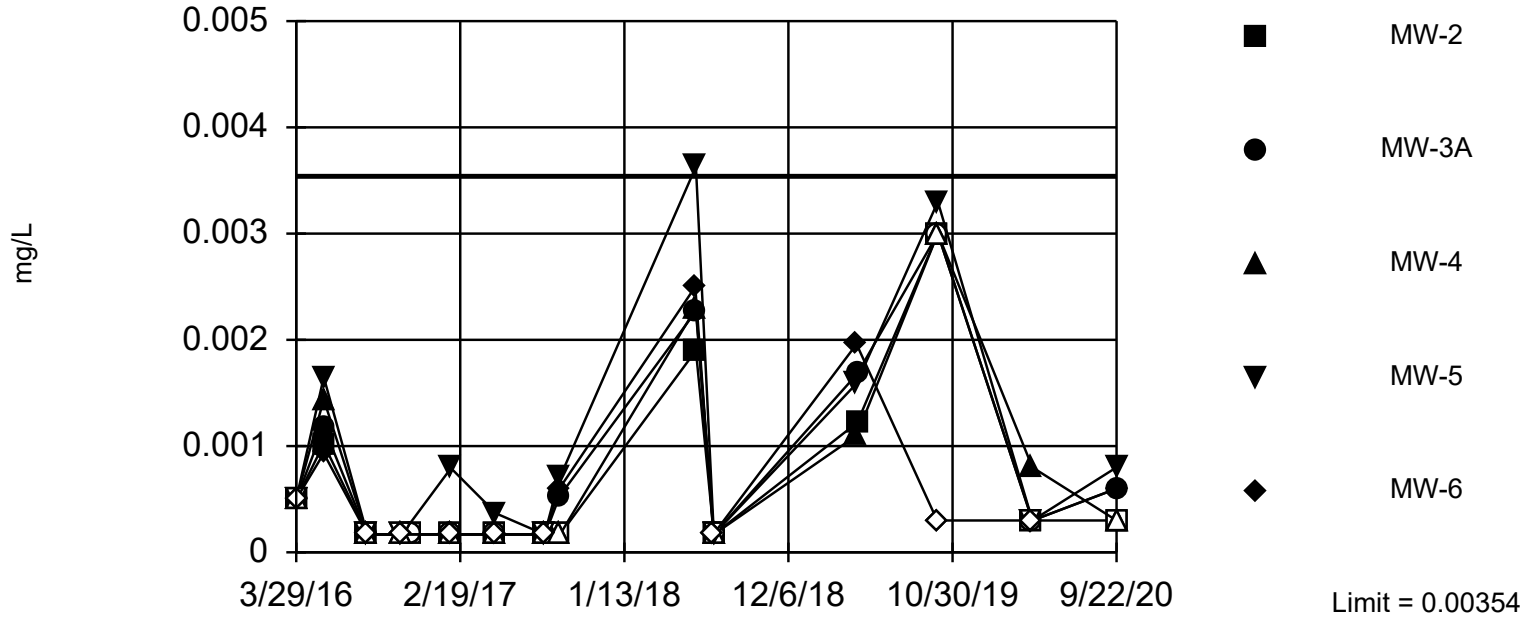
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 64.29% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit.

Constituent: Chromium Analysis Run 12/7/2020 2:55 PM

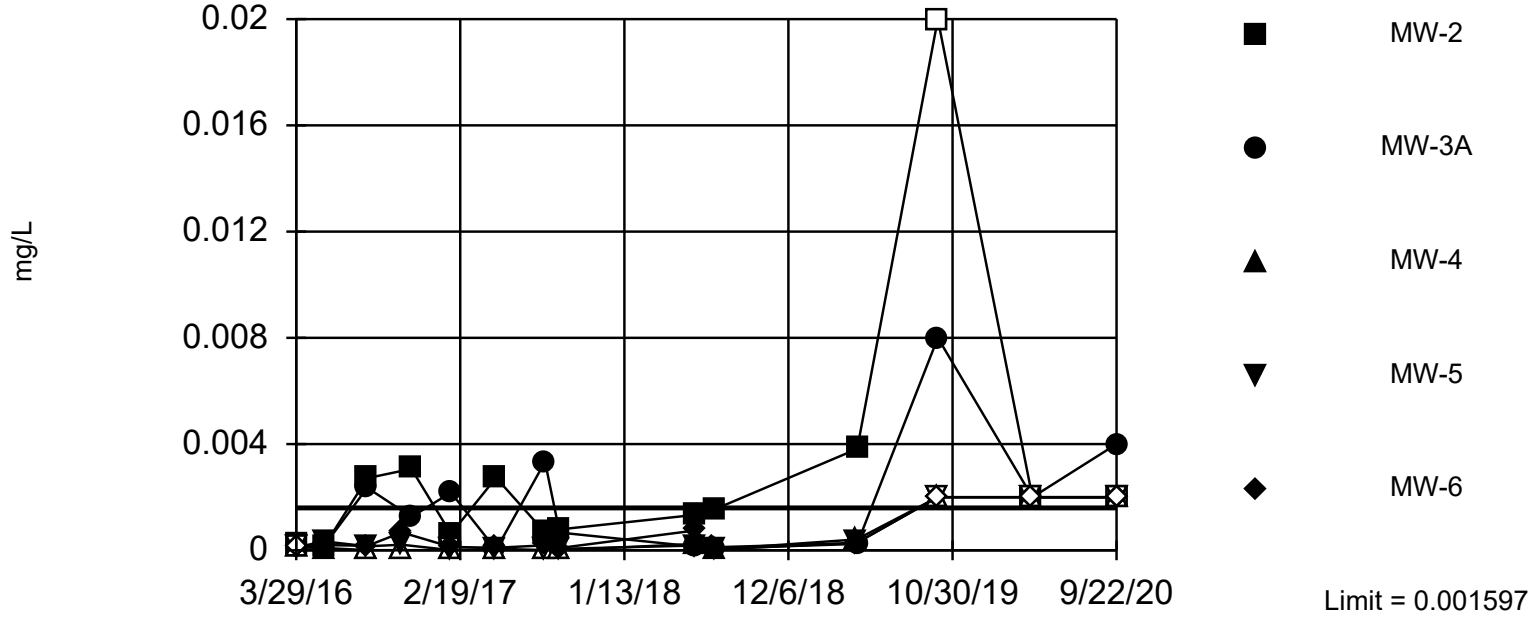
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-3A

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0005576, Std. Dev.=0.0004471, n=13, 23.08% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.4E-05 (7/10/2018).

Constituent: Cobalt Analysis Run 12/7/2020 2:57 PM

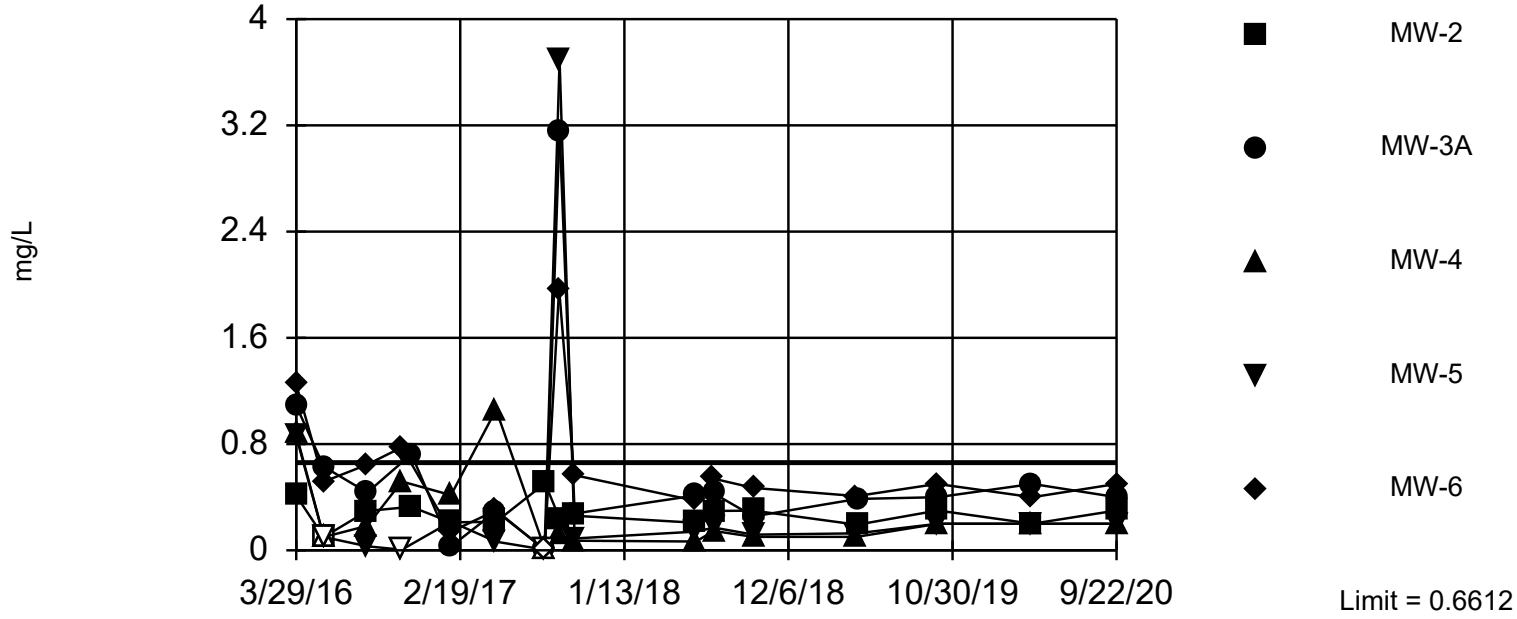
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.5519, Std. Dev.=0.04757, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 0.888 (3/29/2016); 0.0204 (5/23/2016).

Constituent: Fluoride Analysis Run 12/7/2020 1:59 PM

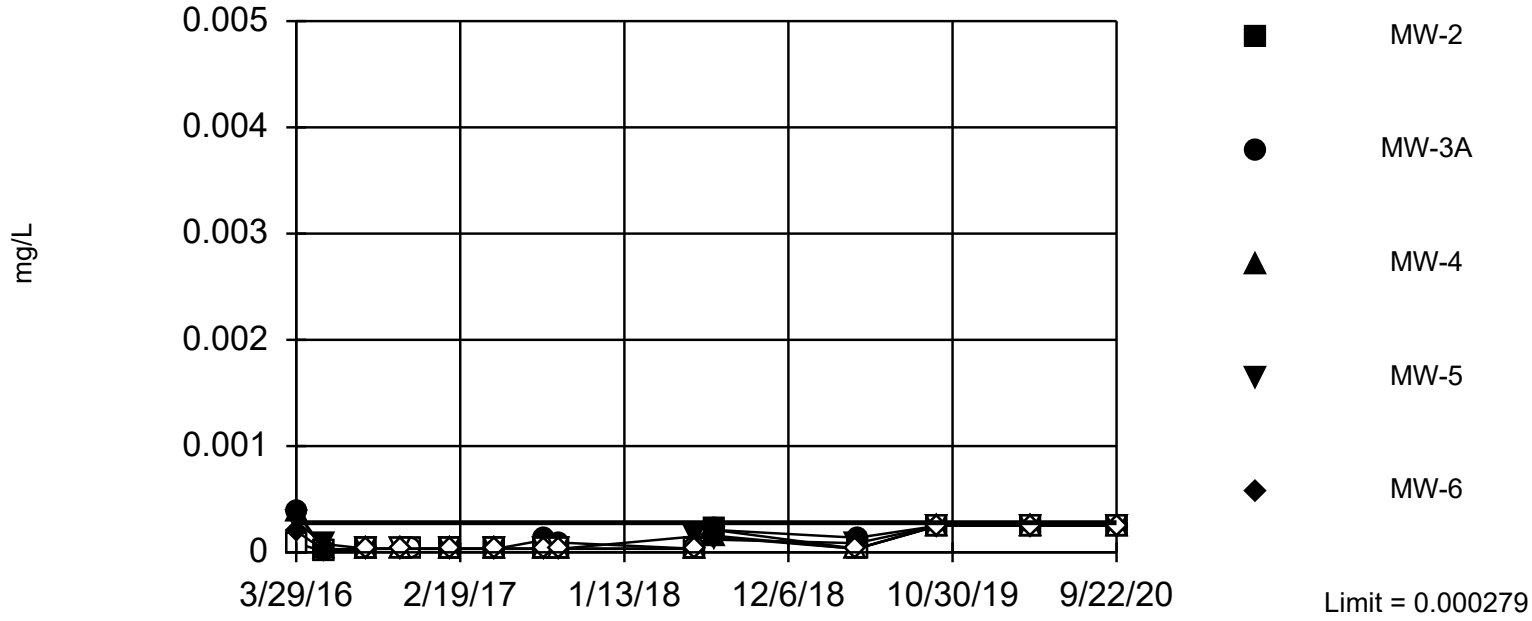
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 57.14% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lead Analysis Run 12/7/2020 3:12 PM

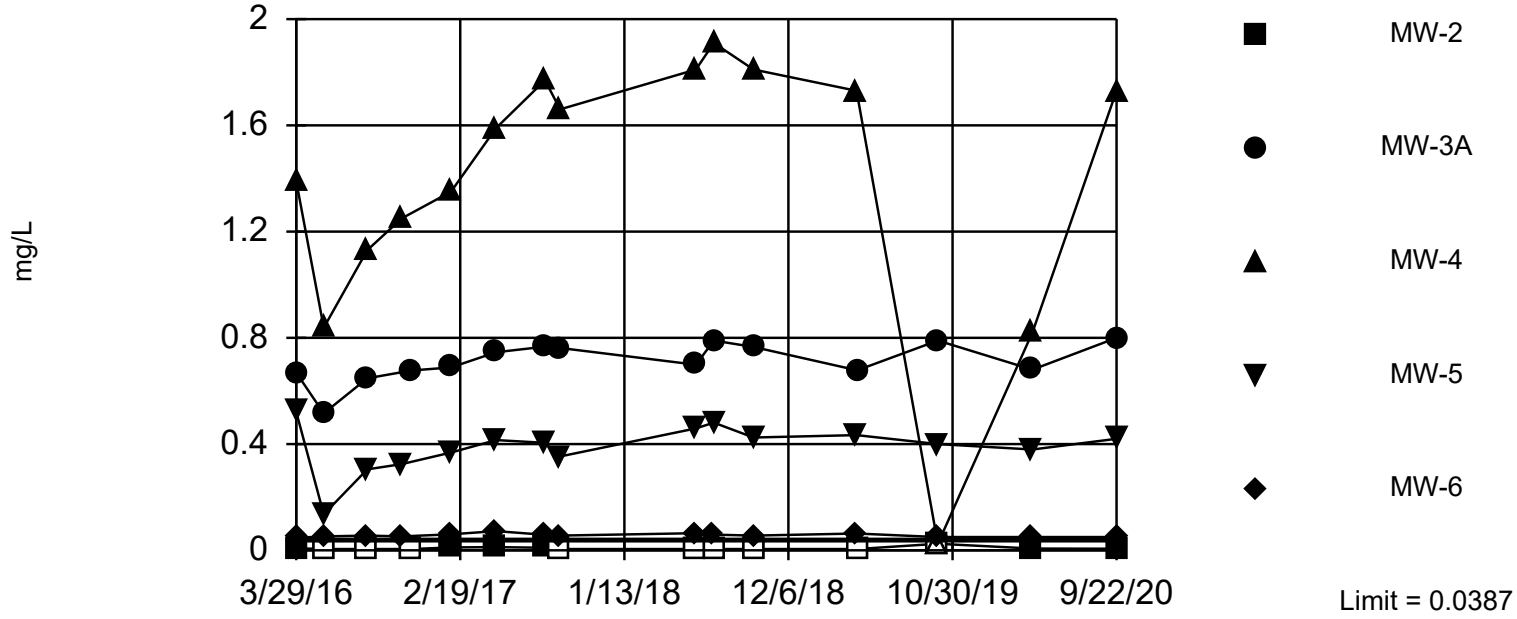
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.03053, Std. Dev.=0.003587, n=15, 13.33% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Lithium Analysis Run 12/7/2020 3:25 PM

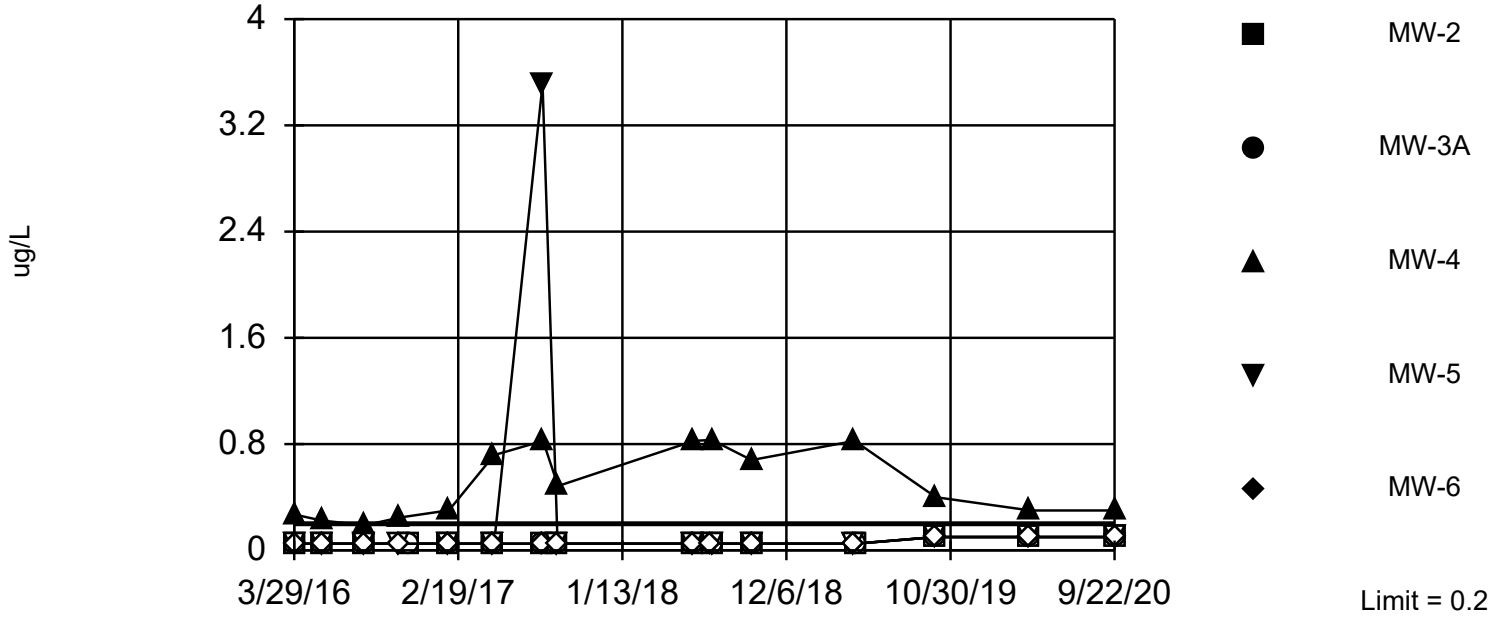
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-4

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. All background values (n = 15) were censored; limit is most recent reporting limit. Report alpha = 0.25. Individual comparison alpha = 0.05591. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Mercury Analysis Run 12/7/2020 3:21 PM

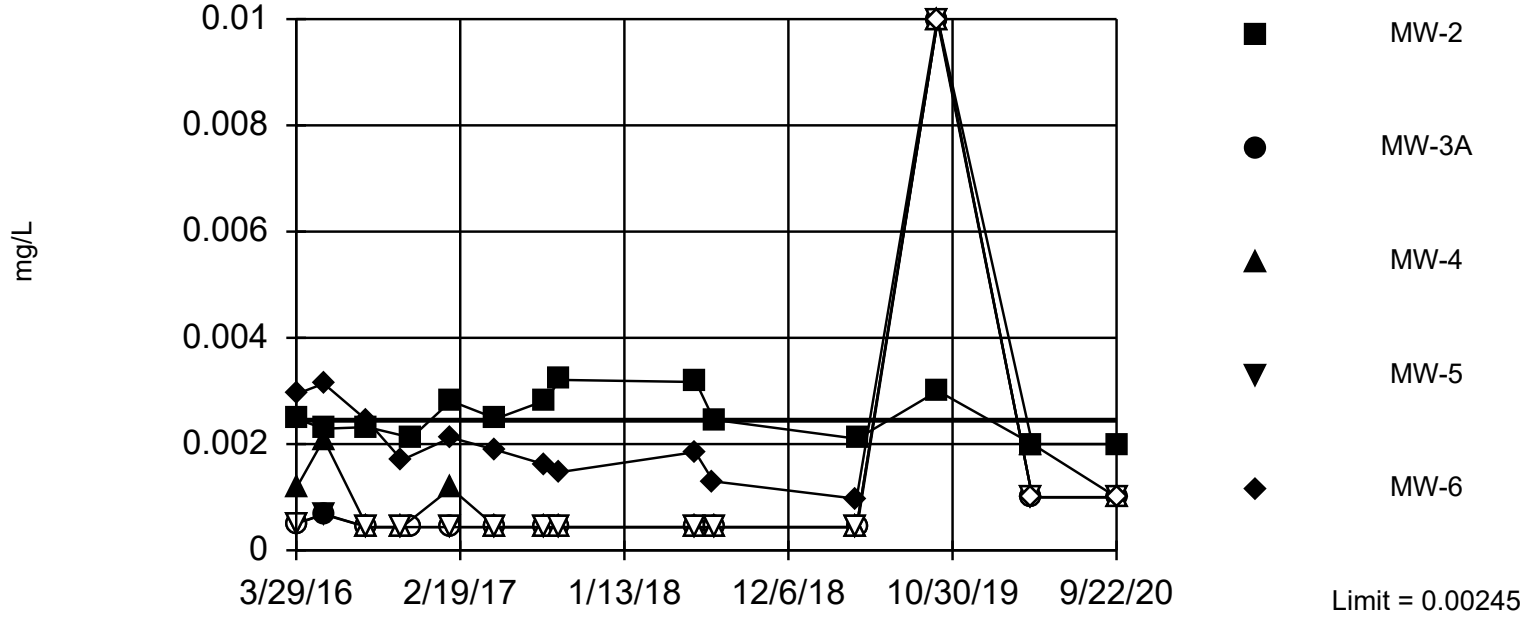
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0008551, Std. Dev.=0.0006941, n=14, 35.71% NDs. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

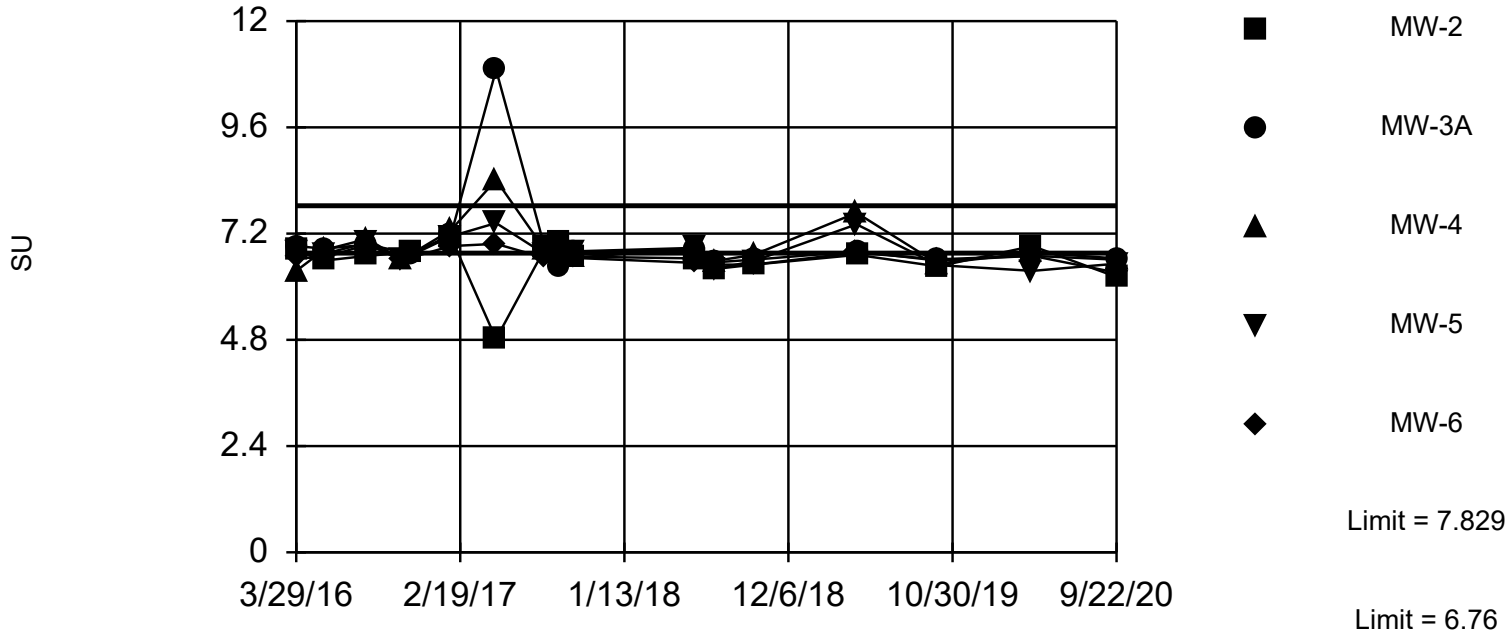
Constituent: Molybdenum Analysis Run 12/7/2020 3:40 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limits: MW-2, MW-3A, MW-4, MW -5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=7.295, Std. Dev.=0.2016, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0112. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 4.86 (5/2/2017).

Constituent: pH [Field] Analysis Run 12/7/2020 1:22 PM

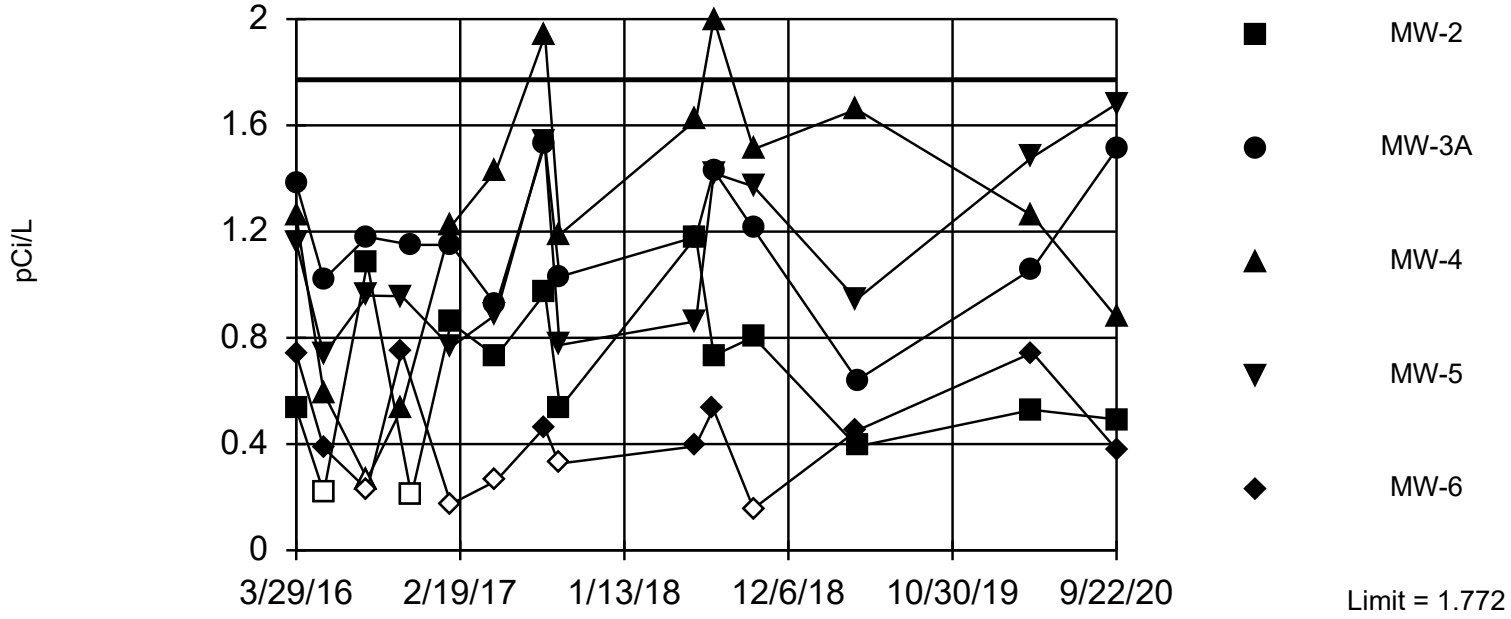
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-0.2162, Std. Dev.=0.343, n=14. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit.

Constituent: Radium 226 + 228 Analysis Run 12/9/2020 10:18 AM

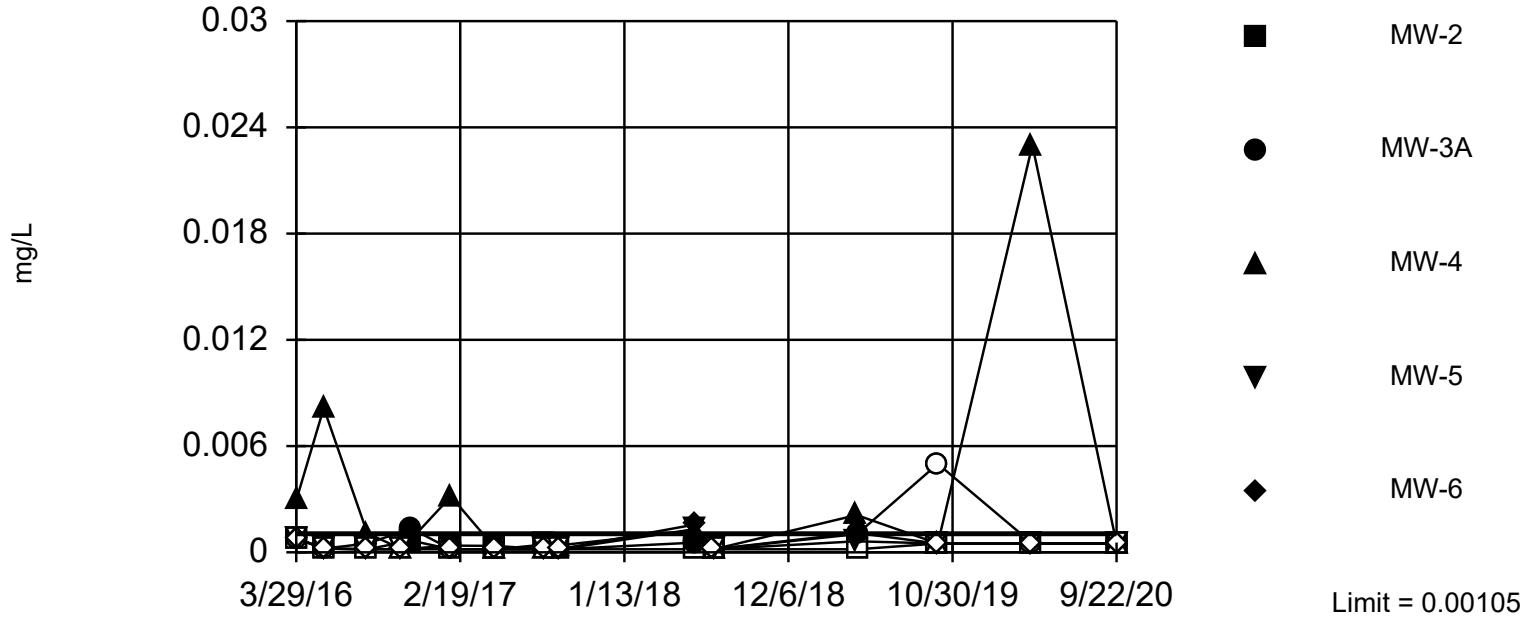
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 85.71% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

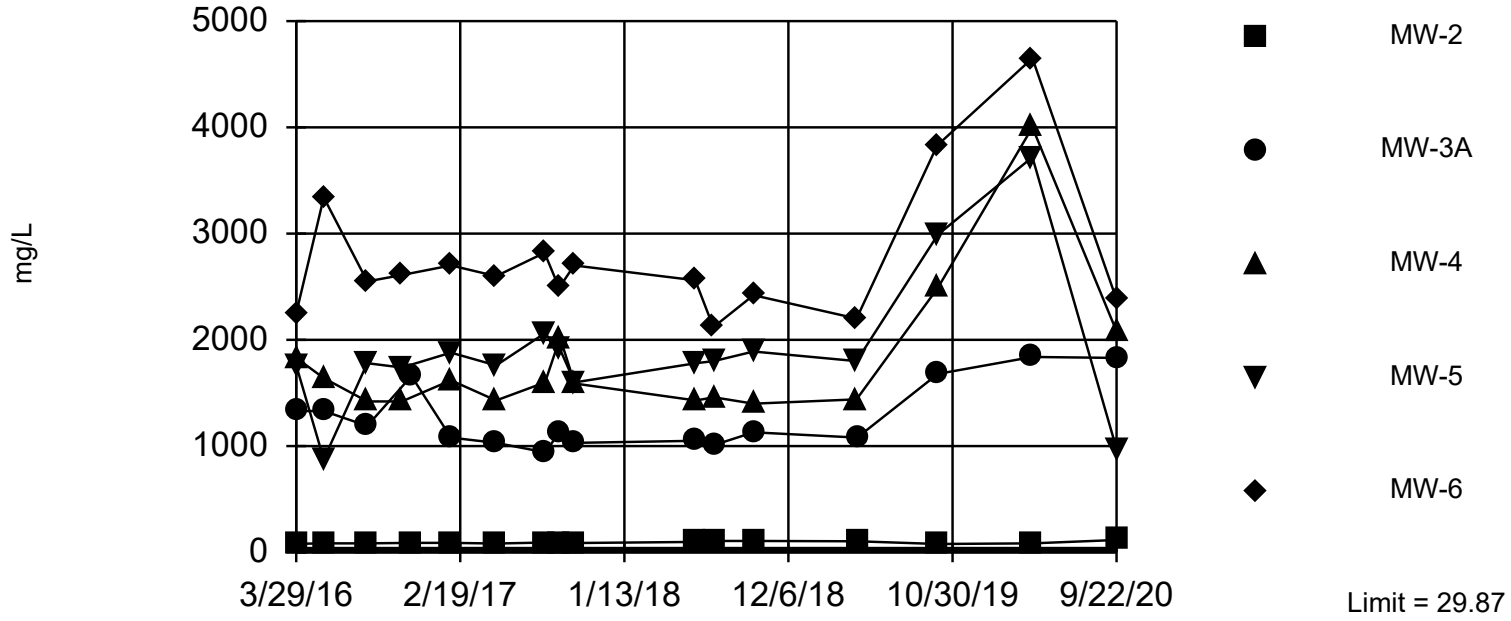
Constituent: Selenium Analysis Run 12/7/2020 3:50 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=23.79, Std. Dev.=2.673, n=15. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 35.1 (4/22/2019).

Constituent: Sulfate Analysis Run 12/7/2020 2:09 PM

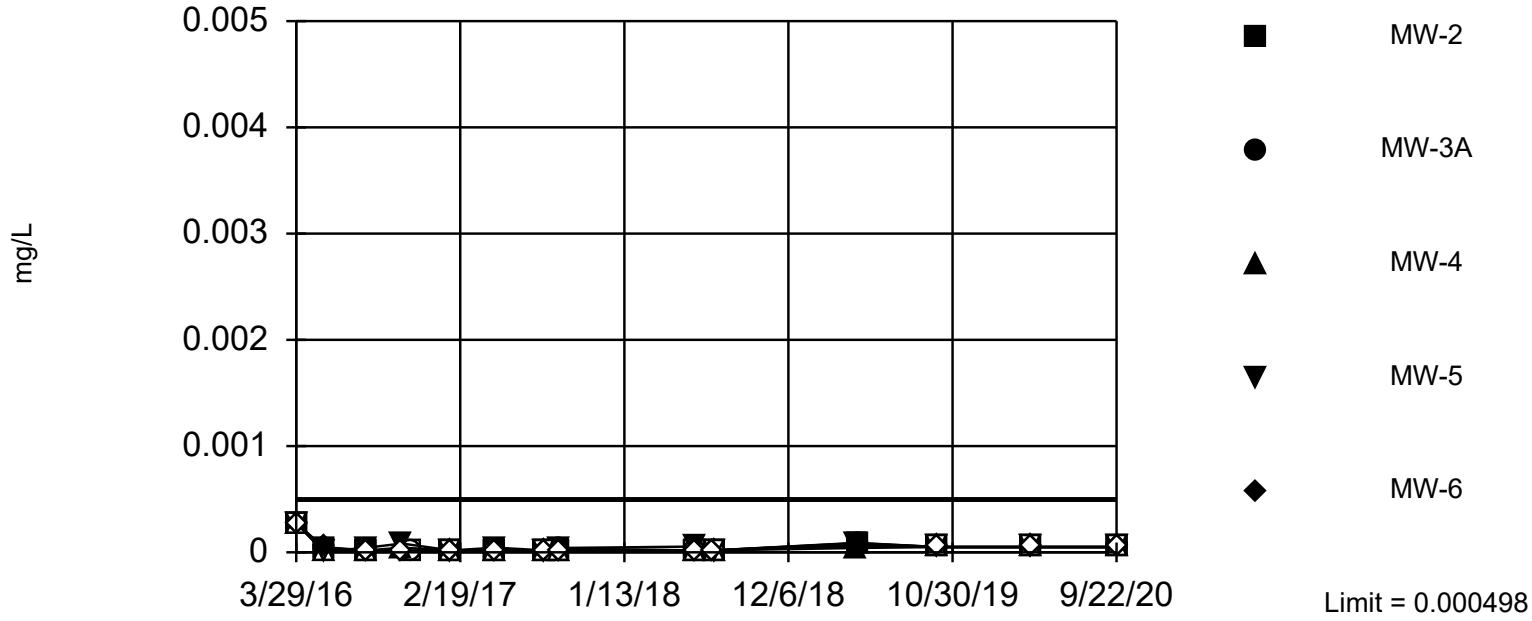
Facility: BREC Green LF Data File: Green LF All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 14 background values. 50% NDs. Report alpha = 0.2632. Individual comparison alpha = 0.05925. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

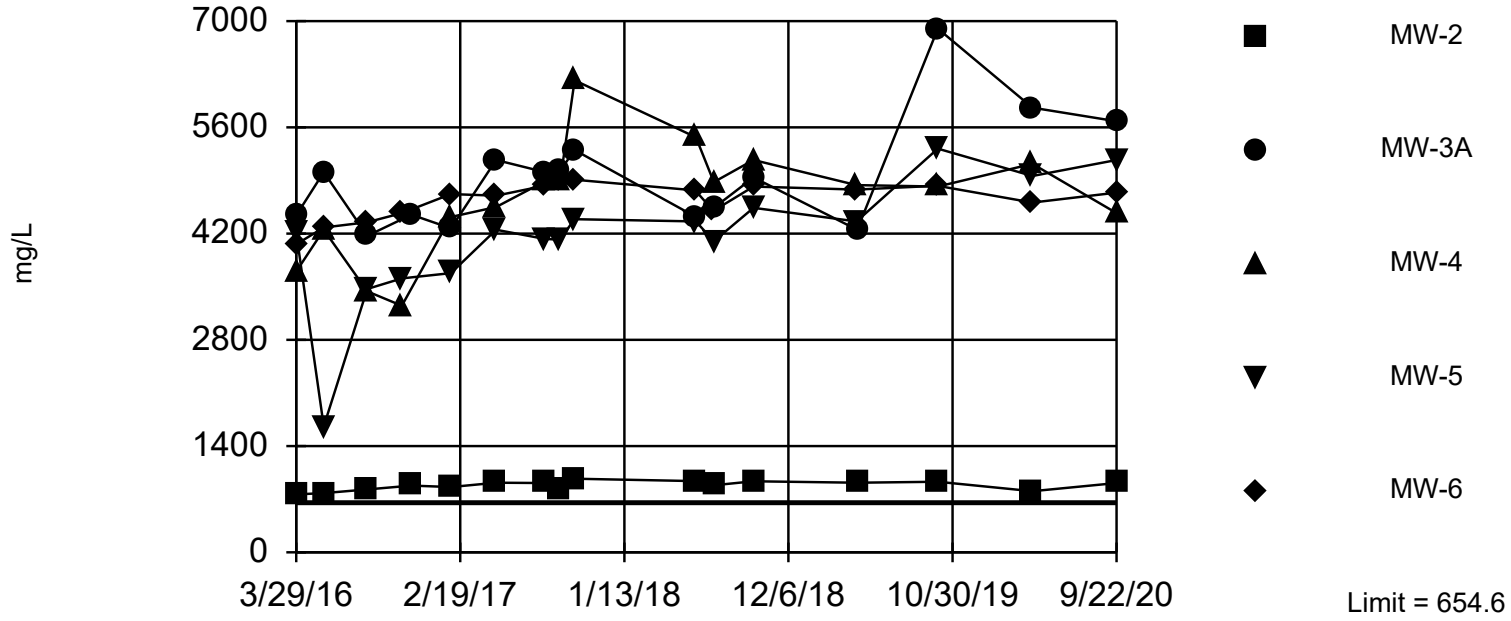
Constituent: Thallium Analysis Run 12/7/2020 3:54 PM

Facility: BREC Green LF Data File: Green LF All Data

Exceeds Limit: MW-2, MW-3A, MW-4, MW-5, MW-6

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=604.7, Std. Dev.=21.48, n=13. Report alpha = 0.1071. Individual comparison alpha = 0.0224. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Three background outliers were removed: 444 (9/30/2019); 488 (4/6/2020); 388 (9/22/2020).

Constituent: Total Dissolved Solids Analysis Run 12/7/2020 2:19 PM

Facility: BREC Green LF Data File: Green LF All Data

Appendix I
Green Surface Impoundment Statistical Evaluations

GREEN SURFACE IMPOUNDMENT STATISTICAL ANALYSIS

2020 Annual Groundwater Monitoring Report

1.0 INTRODUCTION

The 40 CFR Part 257 Appendix III 2020 groundwater monitoring data at the Green Surface Impoundment were evaluated to determine the occurrence of any statistically significant increases over background (SSIs).

2.0 STATISTICAL ANALYSIS

A determination of whether SSIs have occurred is required by 40 CFR 257.93(h)(2) for each semiannual monitoring event. The occurrence of SSIs was evaluated using an *interwell* prediction limit approach that statistically 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, whereas monitoring wells MW-12, MW-13, and MW-14 are designated downgradient detection monitoring wells.

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), the Groundwater Monitoring System and Statistical Methods Certification, and following guidance presented in ASTM D6312-17 *Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs,* and US EPA (2009) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. The test procedures were designed to balance facility-wide false positive rate and statistical power.

Site data are maintained in a Sanitas™ statistical evaluation database that was used to conduct the analyses presented herein.

2.1 Prediction Limits

Appropriate statistical prediction limits (PLs) were developed for each of the 21 Appendix III and Appendix IV monitoring constituents, as outline below, and followed the following general procedures.

1. Analytical Data Review
2. Goodness-of-Fit Testing
3. Perform adjustments to data based on the frequency on non-detect values
4. Comparison to interstation background

The background data sets for the statistical analyses consisted of analytical measurements at MW-11 collected from two background spring sampling locations (SP-10 and SP-13) collected from April 2016 to present. The background utilized for the September 2020 analysis was updated to include the data from that event.

2.2 Analytical Data Review

Analytical data were reviewed for consistency with historic data prior to any statistical evaluation. Background data were checked for outliers and high or low outliers were removed following EPA (1989) procedures prior to statistical analysis. Outliers include some previous values with elevated detection limits.

2.2.1 Goodness-of-Fit Testing

Four types of background monitoring data sets.

1. Normally distributed (or transformed normal) data sets with the frequency of censored (non-detect) values less than 50 percent

2. Non-normal (or transformed non-normal) data sets with the frequency of censored values less than 50 percent
3. Data sets for which the population distribution is not known due to the frequency of censored values greater than 50 percent
4. Data consisting of 100 percent censored values

The appropriate statistical comparison depends on the type of data set under consideration. Parametric test procedures are utilized wherever possible to increase statistical power. In general, parametric tests are utilized where the data distribution may be assumed to be normal, or transformed normal (data set 1, above). Non-parametric procedures are used where data may not confidently be assumed to be normal (data set 2, above), or where the frequency of non-detect values precludes the testing of normality (data set 3, above). Finally, it is recognized that for 100 percent non-detect data (data set 4, above) no valid statistical comparison may be made, and comparisons must be made to fixed, arbitrary values, such as the analytical method detection or quantitation limit.

To determine the type of dataset, goodness-of-fit testing was performed on both the raw data and natural logarithm of the raw greater than detection limit values using the Shapiro-Wilk W-test as recommended by US EPA (1992) and Gilbert (1987). The tests were conducted at a 95 percent confidence level with outliers removed from the dataset.

Data sets that could not confidently be determined to be normally or log normally distributed were used to determine *nonparametric* prediction limits. Data that were normally or log normally distributed were considered as a basis for calculating *parametric* prediction limits, providing that the percentage of less than detection limit values was greater than 50 percent.

2.2.2 Adjustments to Data Based on the Frequency of Non-Detect Values

After goodness-of-fit testing was completed, the frequency of less than detection limit (left censored) values was be evaluated. If the degree of left-censoring was greater than 15%, Aitchison's adjustment was used to obtain adjusted estimates of the sample mean and standard deviation. These adjusted values were then used to calculate the upper prediction limit for those data determined to be normally or log normally distributed during goodness-of-fit testing. For the statistical analysis, non-detect values were represented as one-half the detection limit.

If the degree of censoring is 50% to 100%, no method exists to reasonably estimate the sample mean and standard deviation. In this case, non-parametric procedures are utilized. If the degree of censoring is 100%, as is commonly the case with volatile organic compounds, no estimates of statistics can be calculated. In this case, a simple comparison to method reporting limit (RL) of the individual analyte is employed as the initial statistical evaluation.

2.2.3 Comparison to Background

Based on the results for goodness-of-fit testing and the degree of censoring of the various data sets, comparisons to background were made using prediction limit procedures (US EPA, 2009). Parametric prediction limits were utilized where the data may be assumed to be normally or log normally distributed.

If the data are determined to be not normal or log normal, or the frequency of non-detect values is greater than 50%, nonparametric upper prediction limits were calculated, as recommended by US EPA (2009).

The prediction limit comparisons balance statistical power and false positive rate, as recommended by US EPA (1992, 2009) and ASTM D6312-17 using verification resampling as discussed below.

2.2.4 False Positive Rate Control

A groundwater monitoring event involves a large number of individual statistical comparisons. For normal prediction limits, if the significance level of an individual statistical comparison (test) is α (defined as the *per-test* false positive rate), the *annual* false positive rate (α^*) is given by (Gibbons 1994):

Equation 1

$$\alpha^* = 1 - (1-\alpha)^r$$

where,

r = the number of annual statistical comparisons to be made
(downgradient monitoring stations × analytes × events per year.

For a typical monitoring scenario, the per-test α is held to a value *no less* than 0.01 (40 CFR 257.93(g)(2). Limiting α to the minimum value of 0.01 guards against an excessive false negative rate, or Type II error, but may result in too large an *event-wide* false positive rate. For each of the 2020 monitoring events there are 7 parameters requiring statistical evaluation (Table I1, c =7). There are three downgradient monitoring wells in the evaluation (Table I1, w = 3). For a single evaluation event (n_E = 1), the number of annual statistical comparisons (r) is equal to c x w x n_E = 21. From Equation 1, the annual false positive rate for the two sampling events is 0.19 Table I1, Row 1. Thus, for each sampling event there would be about a 19 percent probability that a statistically significant result would be obtained even though no real statistical exceedance occurred.

To limit the annual false positive rate to 0.1, as suggested by EPA (2009) (or to a corresponding event-wide false positive rate of 0.05 for semiannual sampling per 40 CFR 257.93(g)(2)), Equation 1 indicates that individual tests would have to be conducted at a significance levels of about 0.0024 (Table I1, Row 2). Very large statistical limits would have to be employed, and the individual *false negative* rate would be unacceptably high at this significance level.

Alternatively, a *verification resampling* strategy is employed to limit the annual-wide false positive rate while maintaining adequate statistical power (EPA 1992, 2009; Gibbons 1994; ASTM 2017). *A statistically significant increase is not declared until both the original sample and some number of verification resamples fail the statistical test procedures*. For the case of one or two verification resampling events, and assuming independence of measurements, α^* may be calculated as (EPA 2009):

Equation 2

$$\alpha^* = 1 - (1-\alpha^m)^r$$

where,

m = the sum of the original sample and number of retest verification samples (1 or 2).

Passing any resample passes the statistical evaluation procedure.

Table I1 Row 3 illustrate a single resample strategy with the resample required to pass. Table I1 Row 4 illustrate the case of two verification resamples with one of the two required to pass.

EPA (2009) and 40 CFR 257.93(g)(2) defines two criteria applicable to statistical analysis of groundwater monitoring data:

1. The per-event false positive rate (α^*) shall be no less than 0.05 per evert, or 0.1 annually, and,
2. The per-test false positive rate (α) shall be no less than 0.01.

These criteria were deemed by EPA to provide acceptable balance between false positive rate control and statistical power and are used for this project. The single verification sample resampling strategy (Table I1, Row 3) fits the EPA criteria and minimizes sampling and analytical cost. A single verification resampling strategy (referred to as "Pass 1 of 2") using a per-test significance level of 0.0494 was therefore used for this statistical analysis. An SSI does not occur unless the original sample and the verification resample both fail the statistical testing.

3.0 RESULTS

Prediction limit results for the two 2020 sampling events are provided in Tables I2 and I3. Time series plots showing prediction limit results are provided for each downgradient well / parameter in Attachment 1

(April 8, 2020 event) and Attachment 2 (September 25 event). Plots in the attachments are arranged in the constituent order listed in the tables.

There were no exceedances of background for any of the seven 40 CFR Part 257 Appendix III monitoring parameters for either 2020 monitoring event. These results are consistent with the previous 2018 and 2019 monitoring results. Based on this analysis assessment monitoring for 40 CFR Part 257 Appendix IV parameters is not required for the next 2021 sampling event.

4.0 REFERENCES

American Society for Testing and Materials (ASTM), 2017, *Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs at Waste Disposal Facilities*. Designation D 6312-17.

Gibbons, R.D. 1994. *Statistical Methods in Ground-Water Monitoring*. John Wiley & Sons.

Gilbert, R.O., 1987, Statistical Methods for Environmental Pollution Monitoring: Van Nostrand Reinhold, New York, 320p.

US EPA, 1989, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance*. Office of Solid Waste Management Division, US EPA, Washington, DC.

-------, 1992, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Addendum to Interim Final Guidance,* Office of Solid Waste, Permits and State Programs Division, July.

-------, 2009, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance,* Office of Resource Conservation and Recovery, Program Implementation and Information Division, March.

Tables

Table I1
2020 Annual Monitoring Report
BREC Green SI
Calculation of False Positive Rates

Row Number	*Number of Downgradient Stations (w)*	*Number of Constituents (c)*	*Number of Evaluations (n_E)*	*Number of Comparisons ($r = w \times c \times n_E$)*	*Target False Positive Rate* (α^*)	*Retest Strategy (1 of m)*	*Individual Comparison False Positive Rate (α)*
1	3	7	1	21	0.19	1	0.0100
2	3	7	1	21	0.05	1	0.0024
3	3	7	1	21	0.05	2	0.0494
4	3	7	1	21	0.05	3	0.1346

Table I2: 2020 Annual Report, BREC Green Suface Impoundment, April 2020 Prediction Limit Results

Constituent Name	Well	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Wells	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Boron (mg/L)	MW-12	0.9087	n/a	4/8/2020	0.31	No	13	MW-11	0.7632	0.07834	0	None	No	0.0494	Param Inter
Boron (mg/L)	MW-13	0.9087	n/a	4/8/2020	0.05ND	No	13	MW-11	0.7632	0.07834	0	None	No	0.0494	Param Inter
Boron (mg/L)	MW-14	0.9087	n/a	4/8/2020	0.2	No	13	MW-11	0.7632	0.07834	0	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-12	380.2	n/a	4/8/2020	98.3	No	14	MW-11	316.3	34.75	0	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-13	380.2	n/a	4/8/2020	86.6	No	14	MW-11	316.3	34.75	0	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-14	380.2	n/a	4/8/2020	195	No	14	MW-11	316.3	34.75	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-12	2348	n/a	4/8/2020	13.9	No	12	MW-11	1938	218.5	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-13	2348	n/a	4/8/2020	22.8	No	12	MW-11	1938	218.5	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-14	2348	n/a	4/8/2020	121	No	12	MW-11	1938	218.5	0	None	No	0.0494	Param Inter
Fluoride (mg/L)	MW-12	0.891	n/a	4/8/2020	0.4	No	14	MW-11	n/a	n/a	14.29	n/a	n/a	0.06267	NP Inter
Fluoride (mg/L)	MW-13	0.891	n/a	4/8/2020	0.3	No	14	MW-11	n/a	n/a	14.29	n/a	n/a	0.06267	NP Inter
Fluoride (mg/L)	MW-14	0.891	n/a	4/8/2020	0.3	No	14	MW-11	n/a	n/a	14.29	n/a	n/a	0.06267	NP Inter
pH [Field] (SU)	MW-12	7.458	6.518	4/8/2020	6.9	No	14	MW-11	6.988	0.2097	0	None	No	0.0247	Param Inter
pH [Field] (SU)	MW-13	7.458	6.518	4/8/2020	6.53	No	14	MW-11	6.988	0.2097	0	None	No	0.0247	Param Inter
pH [Field] (SU)	MW-14	7.458	6.518	4/8/2020	6.57	No	14	MW-11	6.988	0.2097	0	None	No	0.0247	Param Inter
Sulfate (mg/L)	MW-12	1407	n/a	4/8/2020	9	No	14	MW-11	1102	166	0	None	No	0.0494	Param Inter
Sulfate (mg/L)	MW-13	1407	n/a	4/8/2020	117	No	14	MW-11	1102	166	0	None	No	0.0494	Param Inter
Sulfate (mg/L)	MW-14	1407	n/a	4/8/2020	183	No	14	MW-11	1102	166	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-12	5235	n/a	4/8/2020	532	No	12	MW-11	4866	196.9	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-13	5235	n/a	4/8/2020	608	No	12	MW-11	4866	196.9	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-14	5235	n/a	4/8/2020	1030	No	12	MW-11	4866	196.9	0	None	No	0.0494	Param Inter

Notes:

Concentration units are as specified in Column 1.

mg/L - milligram per liter

su - standard units

n/a - not applicable

ND - Compound not detected, preceding number is one-half the reporting limit.

NP Inter - Non-parametric interstation prediction limit.

Param Inter - Parametric interstation prediction limit.

Table I3: 2020 Annual Monitoring Report, BREC Green Surface Impoundment, September 2020 Prediction Limit Results

Constituent Name	Well	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Wells	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Boron (mg/L)	MW-12	0.9965	n/a	9/25/2020	1ND	No	15	MW-11	0.7948	0.1105	13.33	None	No	0.0494	Param Inter
Boron (mg/L)	MW-13	0.9965	n/a	9/25/2020	1ND	No	15	MW-11	0.7948	0.1105	13.33	None	No	0.0494	Param Inter
Boron (mg/L)	MW-14	0.9965	n/a	9/25/2020	1ND	No	15	MW-11	0.7948	0.1105	13.33	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-12	379.3	n/a	9/25/2020	89.6	No	15	MW-11	317.5	33.83	0	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-13	379.3	n/a	9/25/2020	84.9	No	15	MW-11	317.5	33.83	0	None	No	0.0494	Param Inter
Calcium (mg/L)	MW-14	379.3	n/a	9/25/2020	194	No	15	MW-11	317.5	33.83	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-12	2514	n/a	9/25/2020	13.5	No	13	MW-11	1991	281.9	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-13	2514	n/a	9/25/2020	33.3	No	13	MW-11	1991	281.9	0	None	No	0.0494	Param Inter
Chloride (mg/L)	MW-14	2514	n/a	9/25/2020	131	No	13	MW-11	1991	281.9	0	None	No	0.0494	Param Inter
Fluoride (mg/L)	MW-12	0.891	n/a	9/25/2020	0.4	No	15	MW-11	n/a	n/a	13.33	n/a	n/a	0.05896	NP Inter
Fluoride (mg/L)	MW-13	0.891	n/a	9/25/2020	0.4	No	15	MW-11	n/a	n/a	13.33	n/a	n/a	0.05896	NP Inter
Fluoride (mg/L)	MW-14	0.891	n/a	9/25/2020	0.3	No	15	MW-11	n/a	n/a	13.33	n/a	n/a	0.05896	NP Inter
pH [Field] (SU)	MW-12	7.436	6.538	9/25/2020	6.83	No	15	MW-11	6.987	0.202	0	None	No	0.0247	Param Inter
pH [Field] (SU)	MW-13	7.436	6.538	9/25/2020	6.8	No	15	MW-11	6.987	0.202	0	None	No	0.0247	Param Inter
pH [Field] (SU)	MW-14	7.436	6.538	9/25/2020	6.75	No	15	MW-11	6.987	0.202	0	None	No	0.0247	Param Inter
Sulfate (mg/L)	MW-12	1418	n/a	9/25/2020	8	No	15	MW-11	1114	166.5	0	None	No	0.0494	Param Inter
Sulfate (mg/L)	MW-13	1418	n/a	9/25/2020	87	No	15	MW-11	1114	166.5	0	None	No	0.0494	Param Inter
Sulfate (mg/L)	MW-14	1418	n/a	9/25/2020	221	No	15	MW-11	1114	166.5	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-12	5234	n/a	9/25/2020	658	No	13	MW-11	4838	212.8	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-13	5234	n/a	9/25/2020	552	No	13	MW-11	4838	212.8	0	None	No	0.0494	Param Inter
Total Dissolved Solids (mg/L)	MW-14	5234	n/a	9/25/2020	946	No	13	MW-11	4838	212.8	0	None	No	0.0494	Param Inter

Notes:

Concentration units are as specified in Column 1.

mg/L - milligram per liter

su - standard units

n/a - not applicable

ND - Compound not detected, preceeding number is one-half the reporting limit.

Param Inter - Parametric interstation prediction limit.

Attachment 1

April 2020 Time Series Plots

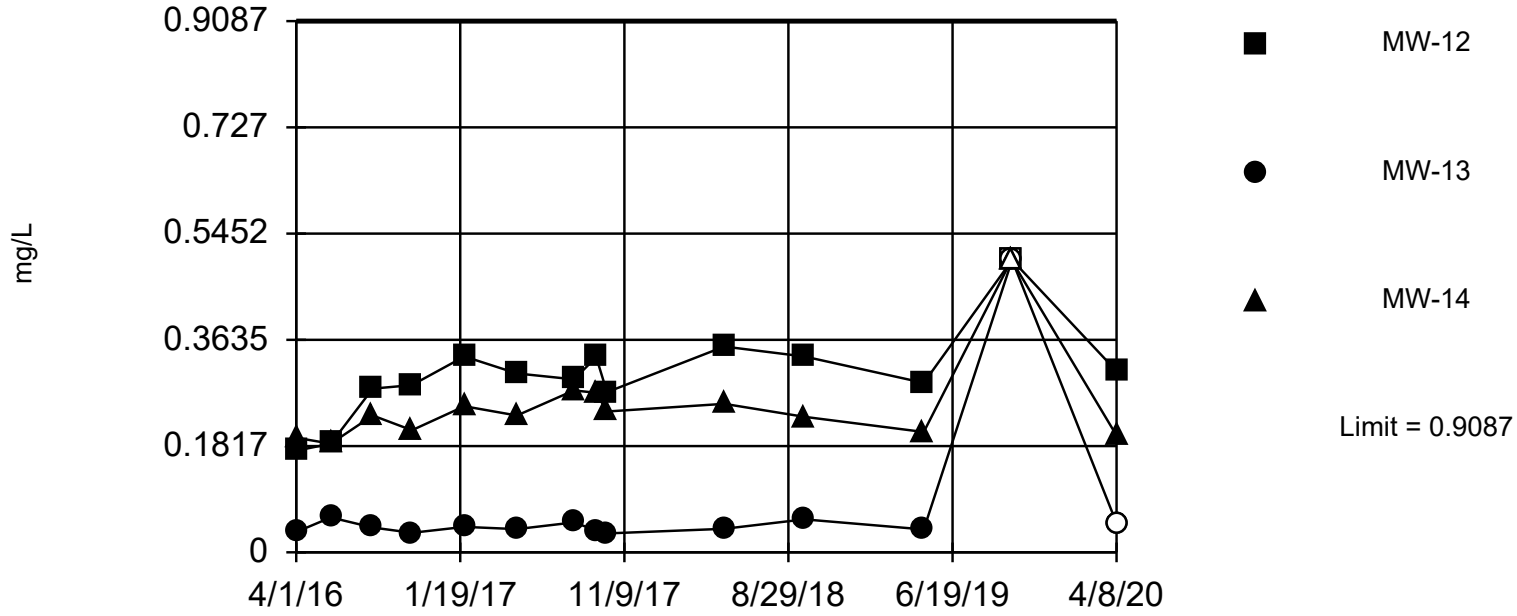
And Prediction Limit Results

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.7632, Std. Dev.=0.07834, n=13. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: <1 (10/3/2019).

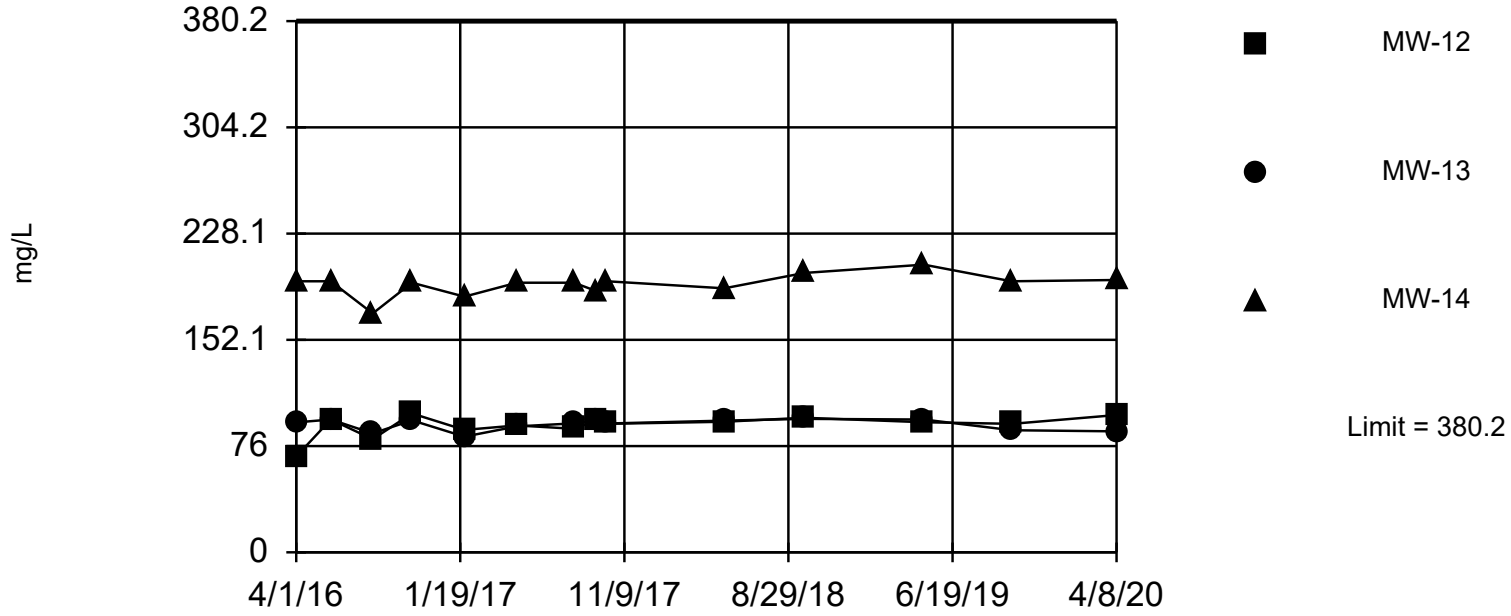
Constituent: Boron Analysis Run 12/3/2020 1:37 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=316.3, Std. Dev.=34.75, n=14. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

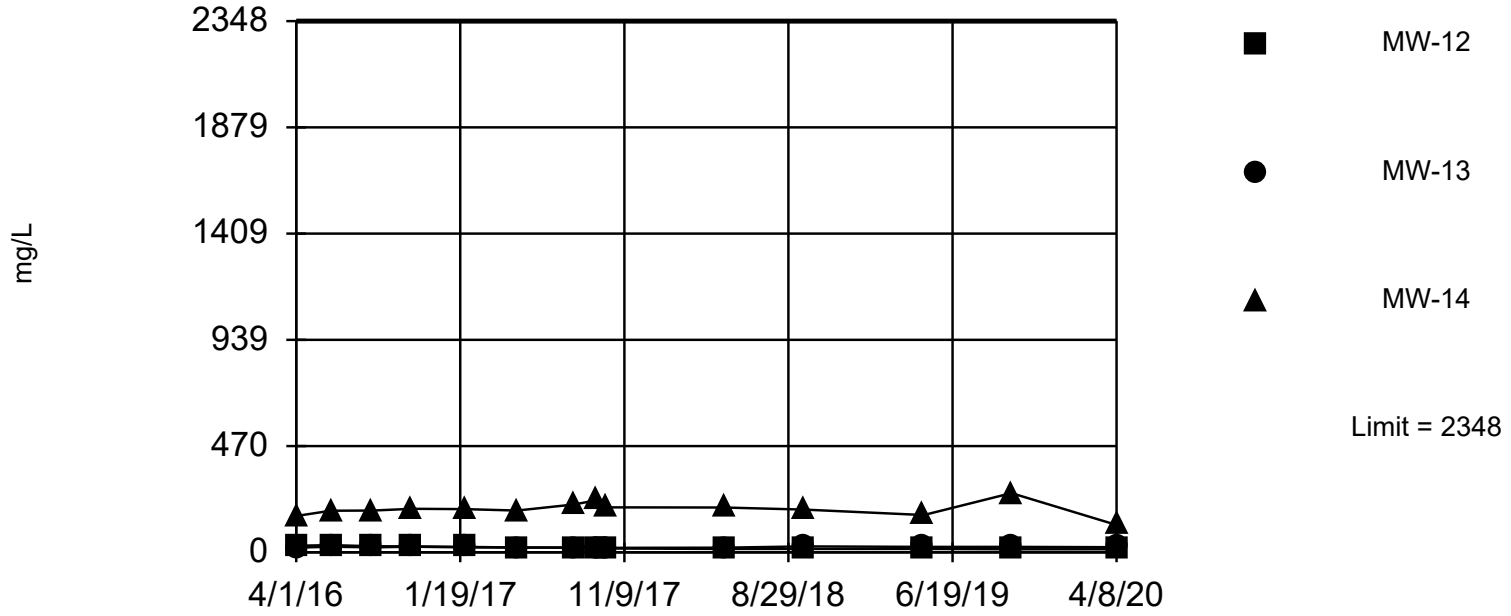
Constituent: Calcium Analysis Run 12/3/2020 1:40 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1938, Std. Dev.=218.5, n=12. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 1070 (4/1/2016); 3900 (10/3/2019).

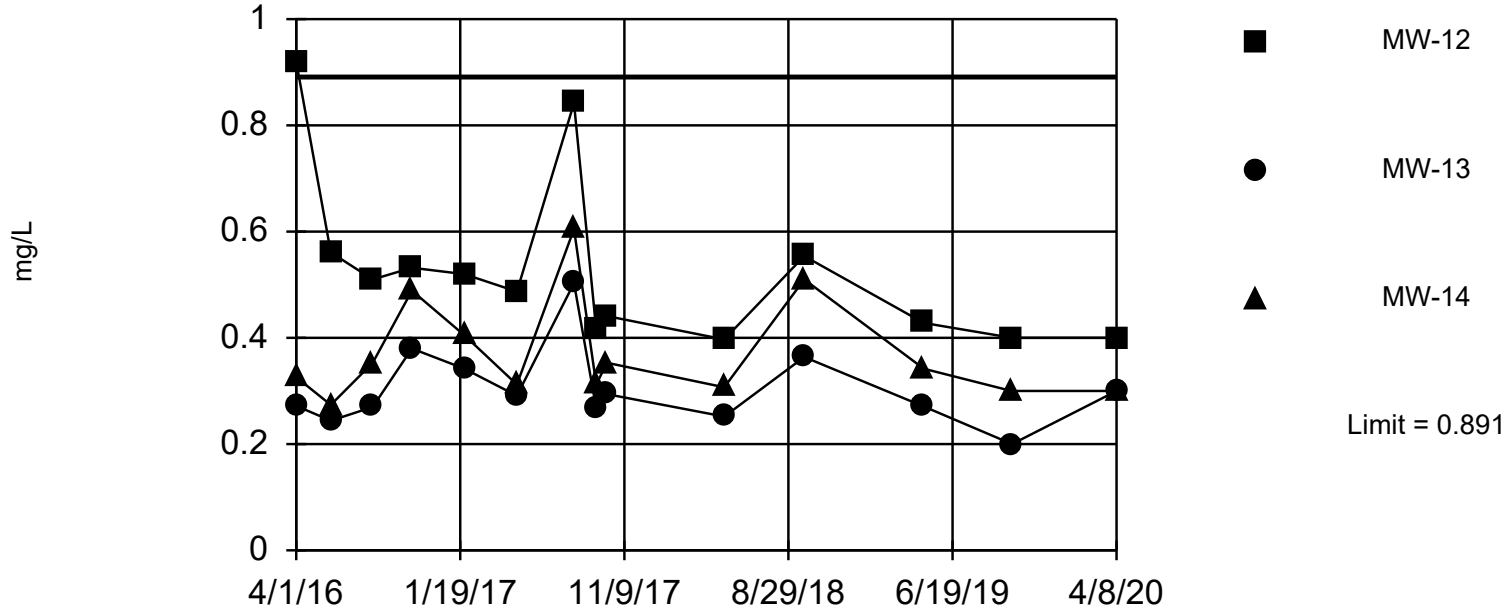
Constituent: Chloride Analysis Run 12/3/2020 1:47 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 14 background values. 14.29% NDs. Report alpha = 0.1765. Individual comparison alpha = 0.06267. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated. Insufficient data to test for seasonality; data will not be deseasonalized.

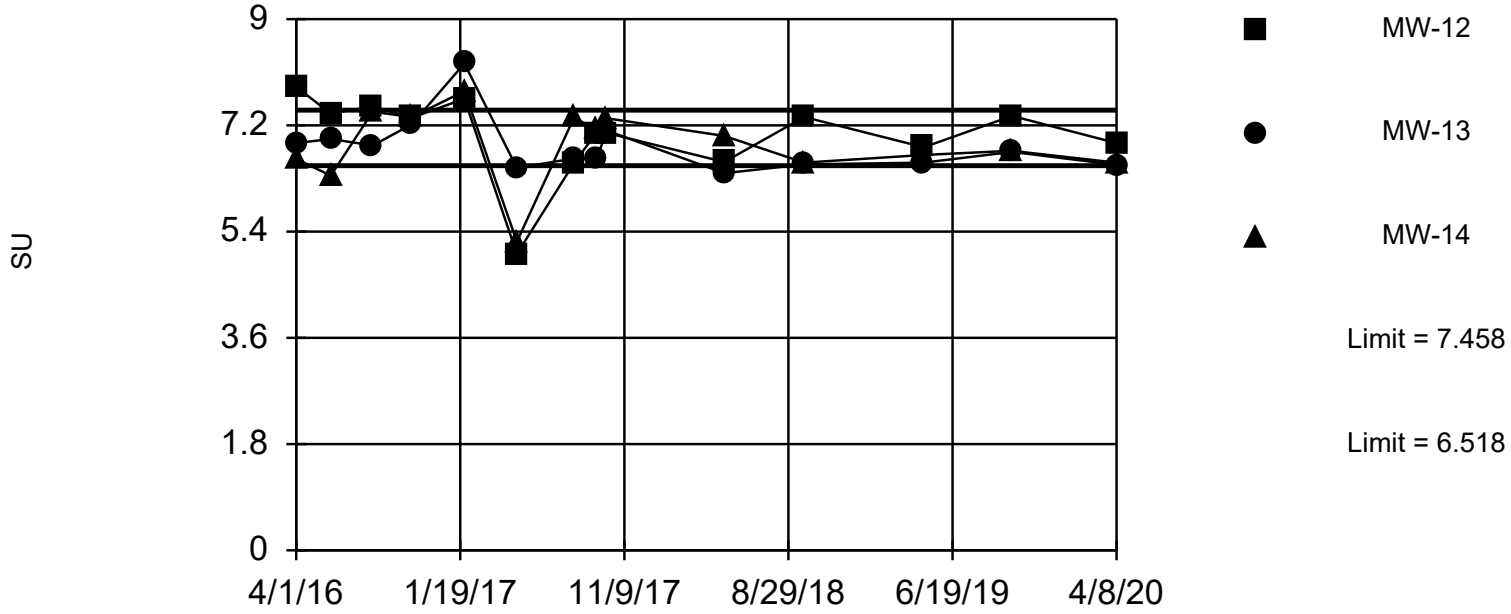
Constituent: Fluoride Analysis Run 12/3/2020 1:49 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limits

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.988, Std. Dev.=0.2097, n=14. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0247. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

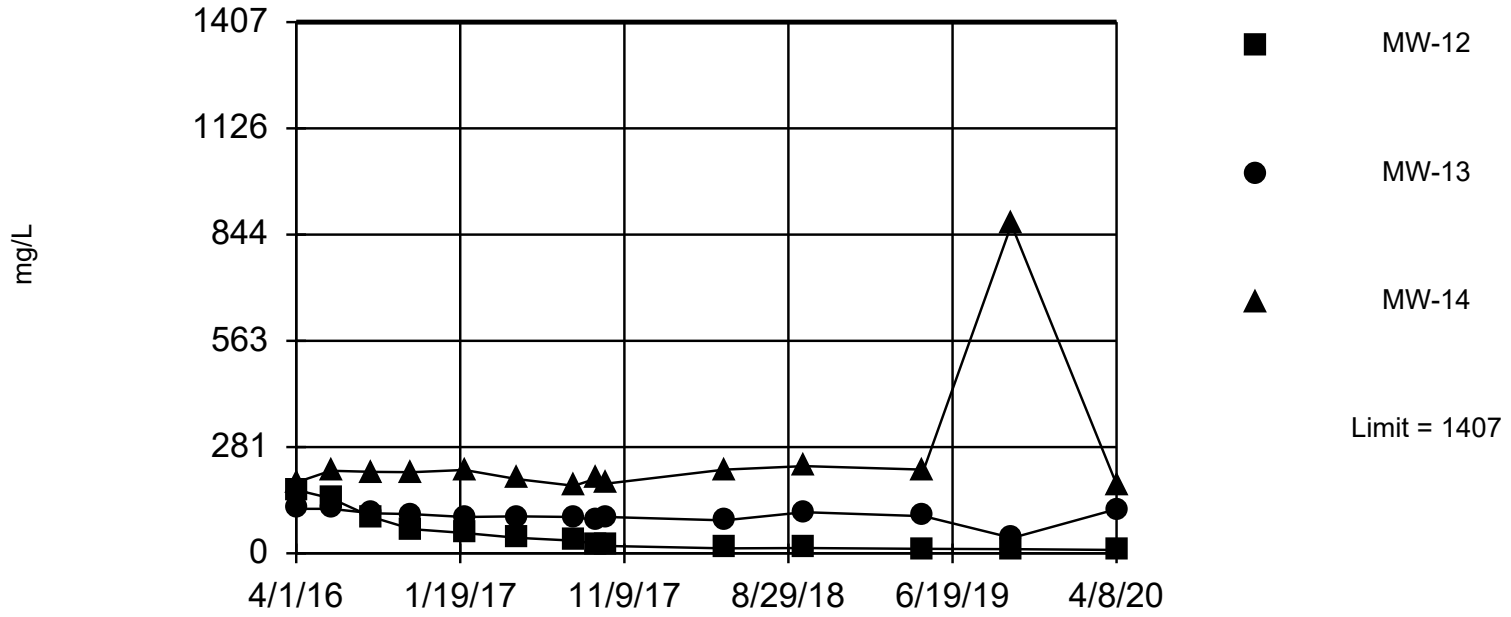
Constituent: pH [Field] Analysis Run 12/3/2020 1:50 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1102, Std. Dev.=166, n=14. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

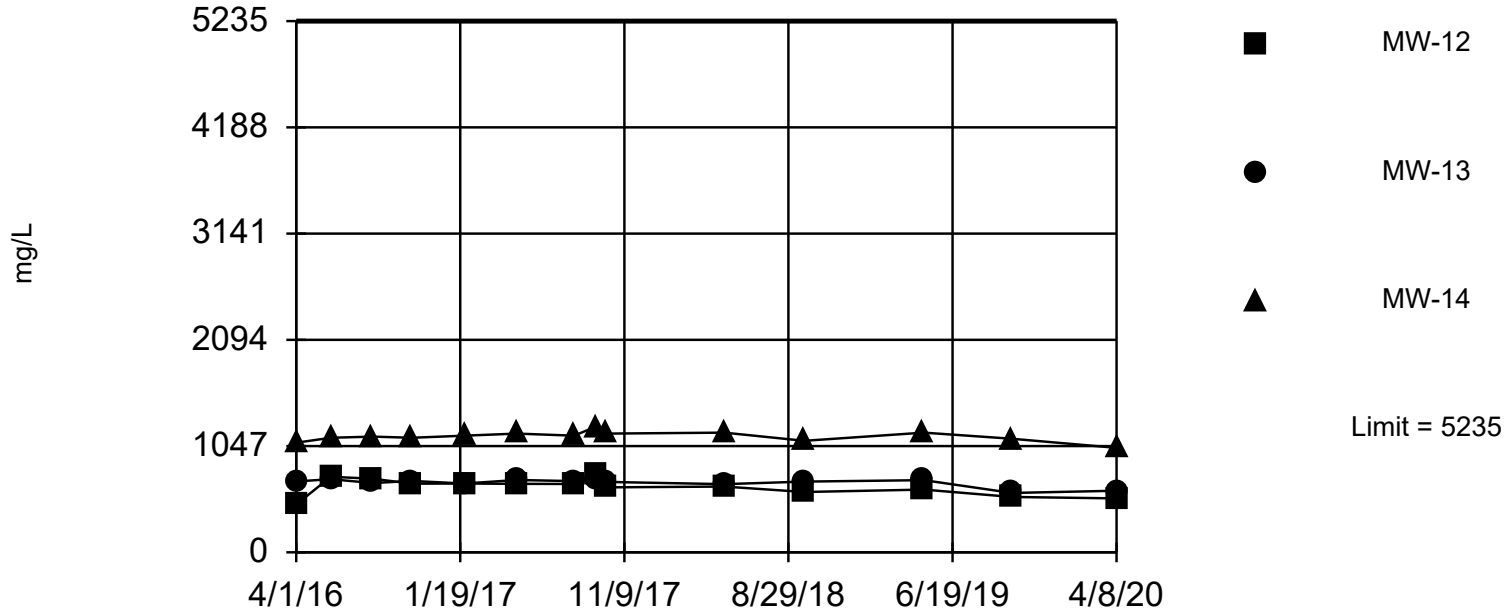
Constituent: Sulfate Analysis Run 12/3/2020 1:52 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4866, Std. Dev.=196.9, n=12. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 3920 (4/1/2016); 682 (10/3/2019).

Constituent: Total Dissolved Solids Analysis Run 12/3/2020 1:58 PM

Facility: BREC Green SI Data File: Green SI All Data_input

Attachment 2

September 2020 Time Series Plots

And Prediction Limit Results

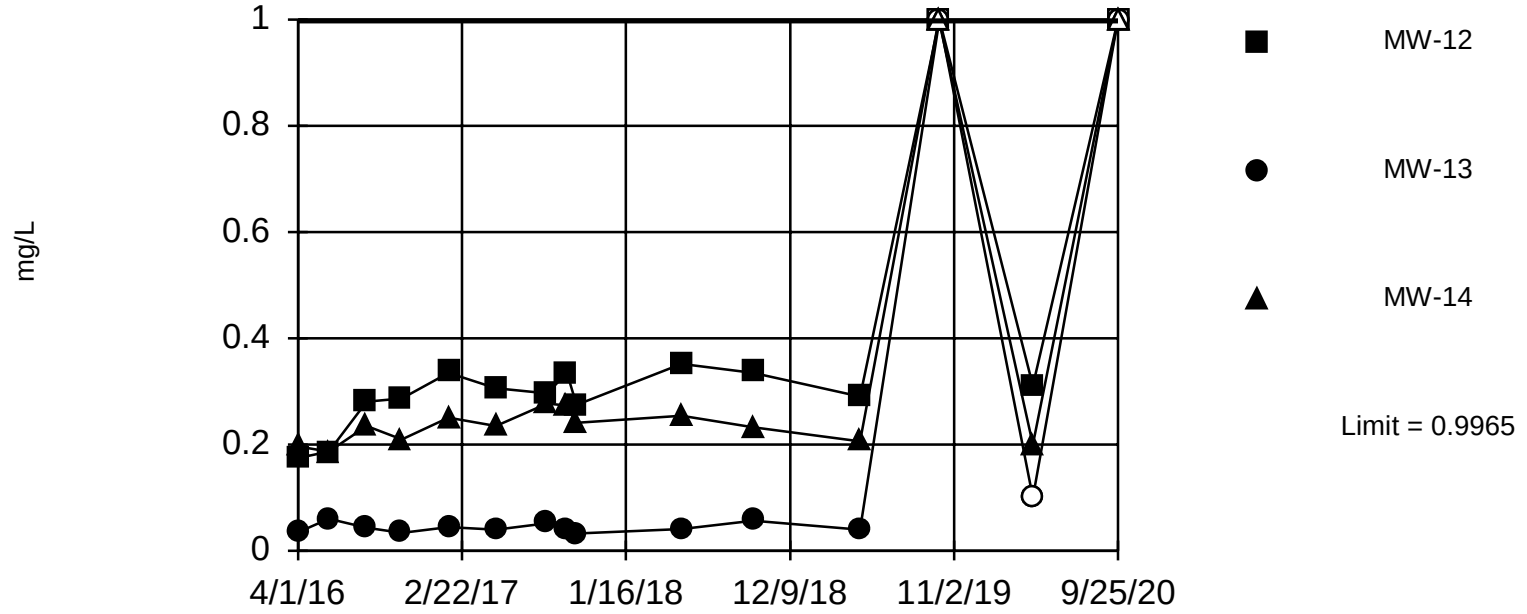
WQStat Plus™ v.9.4.32

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.7948, Std. Dev.=0.1105, n=15, 13.33% NDs. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit.

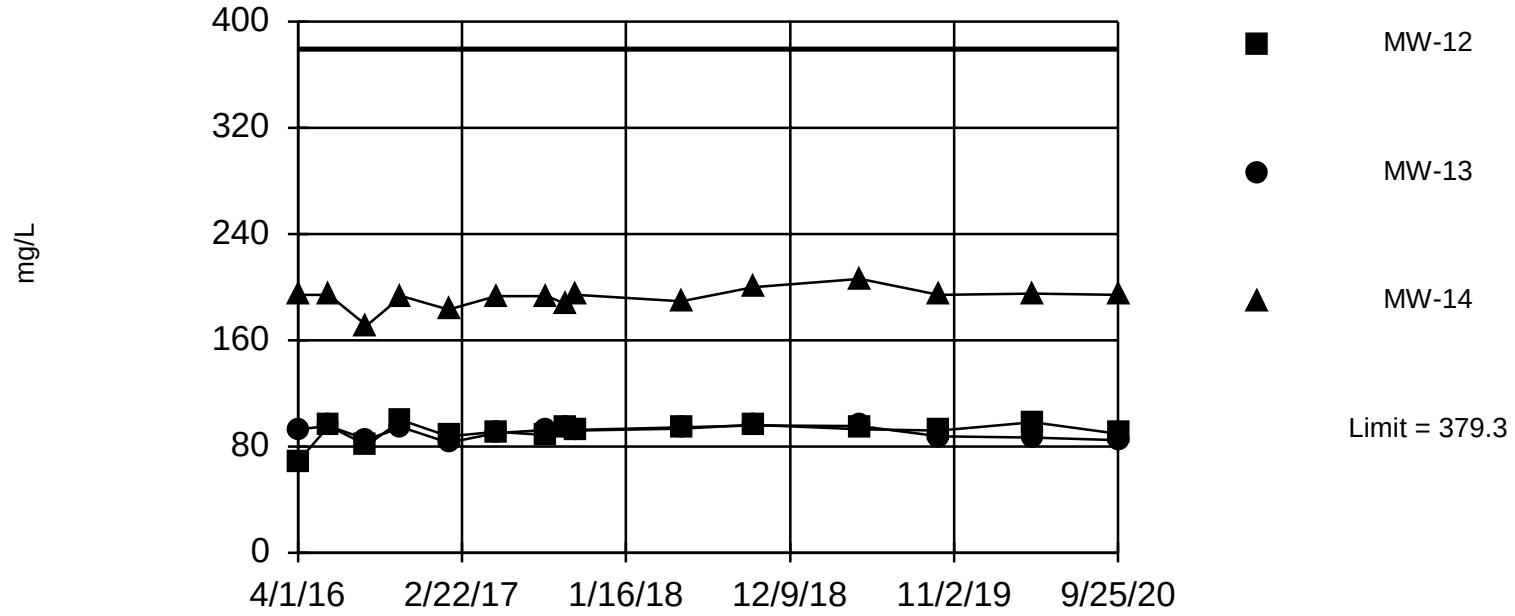
Constituent: Boron Analysis Run 11/19/2020 9:55 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=317.5, Std. Dev.=33.83, n=15. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit.

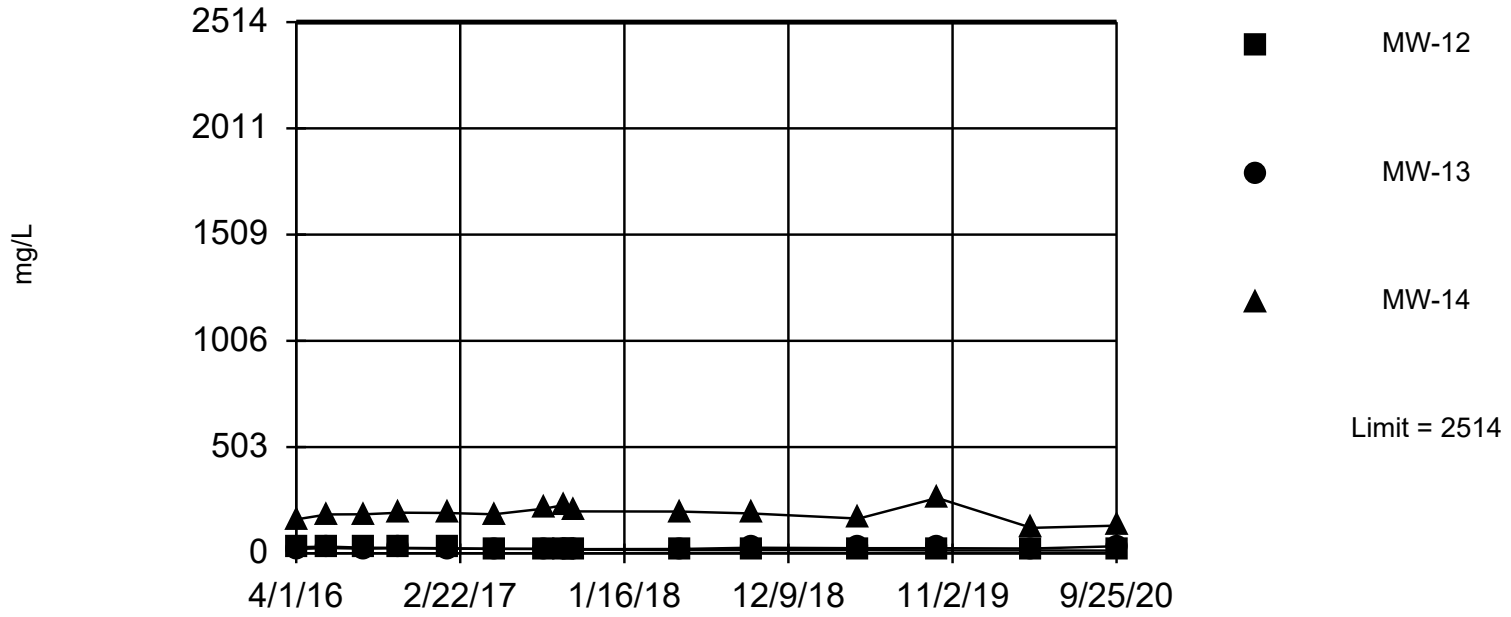
Constituent: Calcium Analysis Run 11/19/2020 9:56 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1991, Std. Dev.=281.9, n=13. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 1070 (4/1/2016); 3900 (10/3/2019).

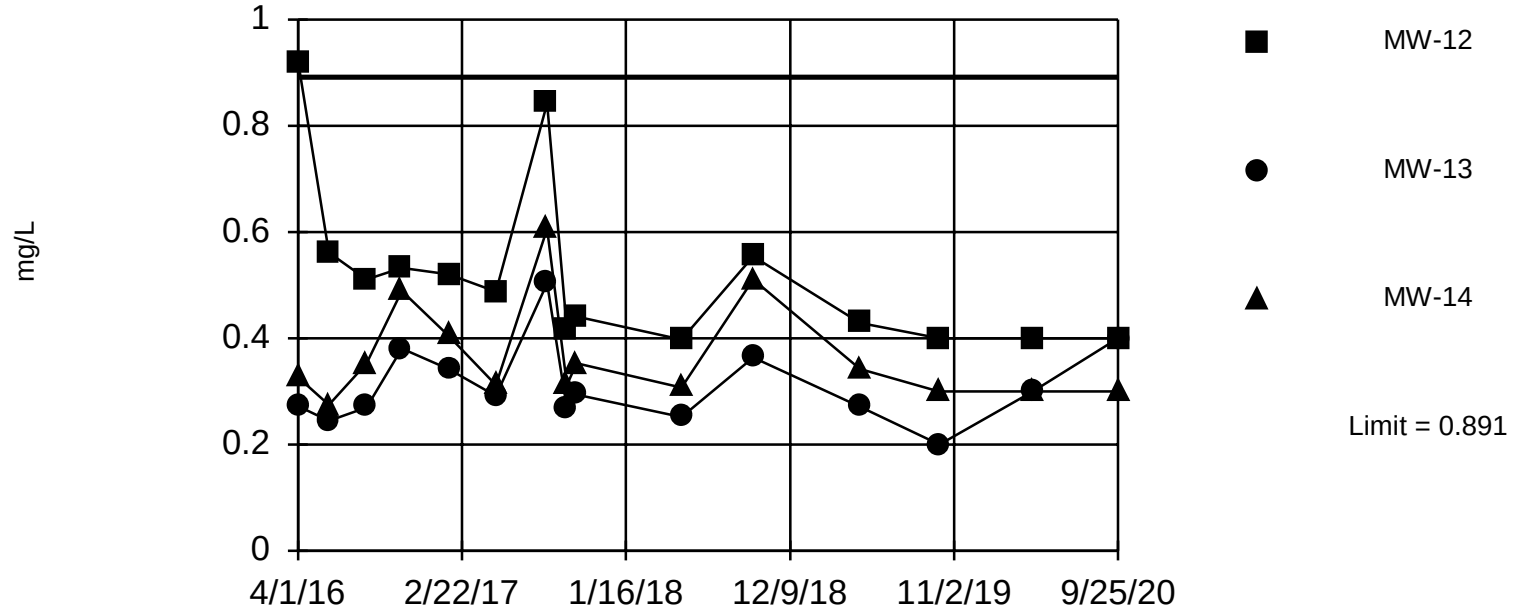
Constituent: Chloride Analysis Run 12/3/2020 11:42 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 15 background values. 13.33% NDs. Report alpha = 0.1667. Individual comparison alpha = 0.05896. Most recent point for each compliance well compared to limit. Insufficient data to test for seasonality; data will not be deseasonalized.

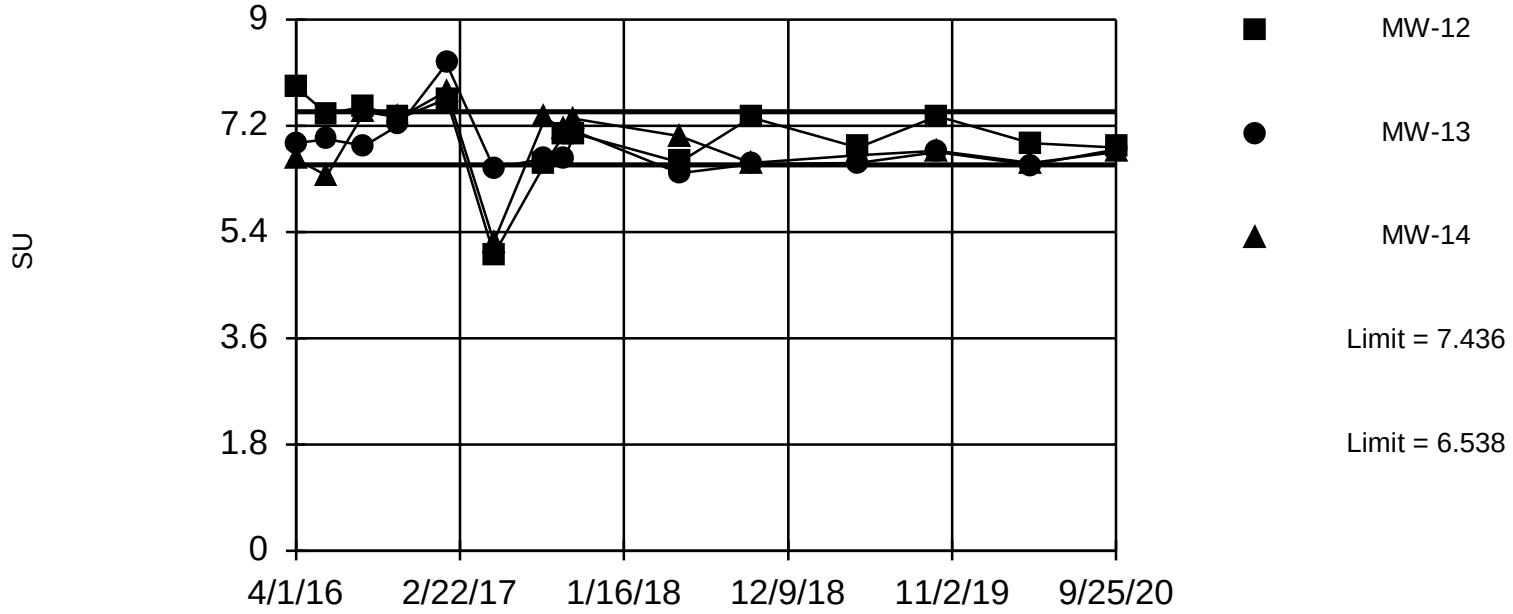
Constituent: Fluoride Analysis Run 11/19/2020 9:57 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limits

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=6.987, Std. Dev.=0.202, n=15. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0247. Most recent point for each compliance well compared to limit.

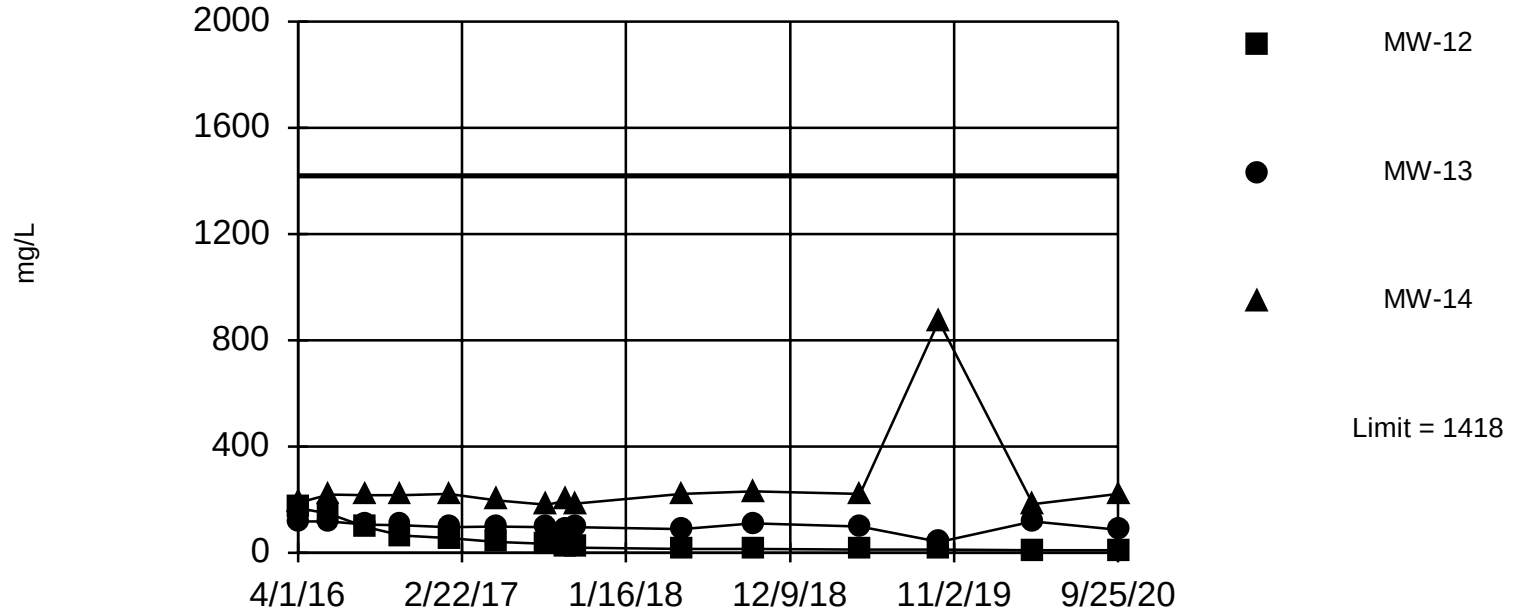
Constituent: pH [Field] Analysis Run 11/19/2020 9:58 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=1114, Std. Dev.=166.5, n=15. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit.

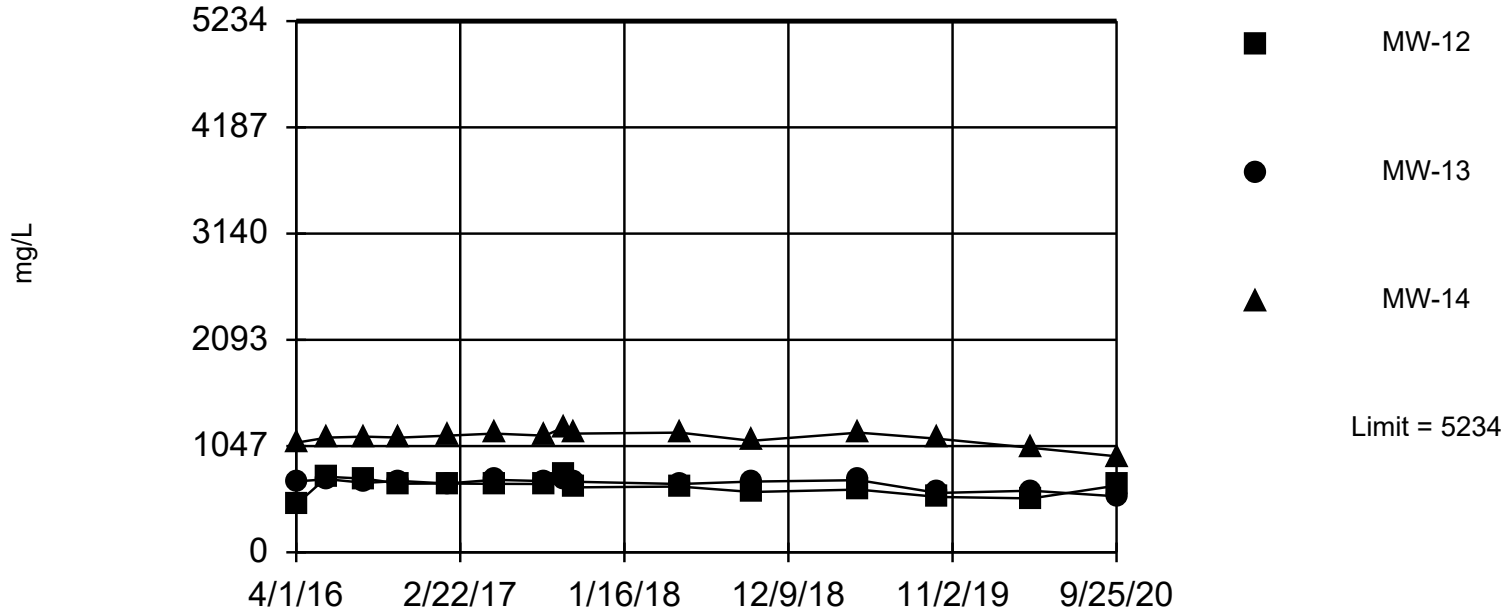
Constituent: Sulfate Analysis Run 11/19/2020 9:59 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4838, Std. Dev.=212.8, n=13. Insufficient data to test for seasonality; data will not be deseasonalized. Report alpha = 0.141. Individual comparison alpha = 0.0494. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 3920 (4/1/2016); 682 (10/3/2019).

Constituent: Total Dissolved Solids Analysis Run 12/3/2020 11:51 AM

Facility: BREC Green SI Data File: Green SI All Data_input

Appendix J
Reid/HMP&L Surface Impoundment Statistical Evaluations

REID SURFACE IMPOUNDMENT STATISTICAL ANALYSIS

2020 Annual Groundwater Monitoring Report

1.0 INTRODUCTION

Previous statistical analysis has indicated that certain 40 CFR Part 257 Appendix III constituents at downgradient monitoring wells MW-8, MW-9, and MW-10 occur at statistically significant higher concentrations than in background monitoring well MW-7. Based on these results, assessment monitoring is conducted for both 40 CFR Part 257 Appendix III and IV parameters at the Reid Surface Impoundment.

The 40 CFR Part 257 Appendix III and IV 2020 groundwater monitoring data at the Reid Surface Impoundment were evaluated to determine the occurrence of any statistically significant increases over background (SSIs) and whether or not any of the SSIs occurred at a statistically significant level (SSL) above the groundwater protection standard as defined at 40 CFR.95(h).

2.0 STATISTICAL ANALYSIS

A determination of whether SSIs have occurred is required by 40 CFR 257.93(h)(2) for each semiannual monitoring event. The occurrence of SSIs was evaluated using an *interwell* approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the Reid Surface Impoundment, monitoring well MW-7 is designated as the background well, whereas monitoring wells MW-8, MW-9, and MW-10 are designated downgradient detection monitoring wells.

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), the Groundwater Monitoring System and Statistical Methods Certification, and following guidance presented in ASTM D6312-17 *Standard Guide for Developing Appropriate Statistical Approaches for Ground-Water Detection Monitoring Programs,* and US EPA (2009) *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. The test procedures were designed to balance facility-wide false positive rate and statistical power.

Site data are maintained in a Sanitas™ statistical evaluation database that was used to conduct the analyses presented herein.

2.1 Prediction Limits

Appropriate statistical prediction limits (PLs) were developed for each of the 21 Appendix III and Appendix IV monitoring constituents, as outline below, and followed the following general procedures.

1. Analytical Data Review
2. Goodness-of-Fit Testing
3. Perform adjustments to data based on the frequency on non-detect values
4. Comparison to interstation background

The background data sets for the statistical analyses consisted of analytical measurements at MW-7 collected from two background spring sampling locations (SP-10 and SP-13) collected from March 2016 to present. The background utilized for the September 2020 analysis was updated to include the data from that event.

2.2 Analytical Data Review

Analytical data were reviewed for consistency with historic data prior to any statistical evaluation. Background data were checked for outliers and high or low outliers were removed following EPA (1989)

procedures prior to statistical analysis. Outliers includes some previous values with elevated detection limits.

2.2.1 Goodness-of-Fit Testing

Four types of background monitoring data sets.

1. Normally distributed (or transformed normal) data sets with the frequency of censored (non-detect) values less than 50 percent
2. Non-normal (or transformed non-normal) data sets with the frequency of censored values less than 50 percent
3. Data sets for which the population distribution is not known due to the frequency of censored values greater than 50 percent
4. Data consisting of 100 percent censored values

The appropriate statistical comparison depends on the type of data set under consideration. Parametric test procedures are utilized wherever possible to increase statistical power. In general, parametric tests are utilized where the data distribution may be assumed to be normal, or transformed normal (data set 1, above). Non-parametric procedures are used where data may not confidently be assumed to be normal (data set 2, above), or where the frequency of non-detect values precludes the testing of normality (data set 3, above). Finally, it is recognized that for 100 percent non-detect data (data set 4, above) no valid statistical comparison may be made, and comparisons must be made to fixed, arbitrary values, such as the analytical method detection or quantitation limit.

To determine the type of dataset, goodness-of-fit testing was performed on both the raw data and natural logarithm of the raw greater than detection limit values using the Shapiro-Wilk W-test as recommended by US EPA (1992) and Gilbert (1987). The tests were conducted at a 95 percent confidence level with outliers removed from the dataset.

Data sets that could not confidently be determined to be normally or log normally distributed were used to determine *nonparametric* prediction limits. Data that were normally or log normally distributed were considered as a basis for calculating *parametric* prediction limits, providing that the percentage of less than detection limit values was greater than 50 percent.

2.2.2 Adjustments to Data Based on the Frequency of Non-Detect Values

After goodness-of-fit testing was completed, the frequency of less than detection limit (left censored) values was be evaluated. If the degree of left-censoring was greater than 15%, Aitchison's adjustment was used to obtain adjusted estimates of the sample mean and standard deviation. These adjusted values were then used to calculate the upper prediction limit for those data determined to be normally or log normally distributed during goodness-of-fit testing. For the statistical analysis, non-detect values were represented as one-half the detection limit.

If the degree of censoring is 50% to 100%, no method exists to reasonably estimate the sample mean and standard deviation. In this case, non-parametric procedures are utilized. If the degree of censoring is 100%, as is commonly the case with volatile organic compounds, no estimates of statistics can be calculated. In this case, a simple comparison to method reporting limit (RL) of the individual analyte is employed as the initial statistical evaluation.

2.2.3 Comparison to Background

Based on the results for goodness-of-fit testing and the degree of censoring of the various data sets, comparisons to background were made using prediction limit procedures (US EPA, 2009). Parametric prediction limits were utilized where the data may be assumed to be normally or log normally distributed.

If the data are determined to be not normal or log normal, or the frequency of non-detect values is greater than 50%, nonparametric upper prediction limits were calculated, as recommended by US EPA (2009).

The prediction limit comparisons balance statistical power and false positive rate, as recommended by US EPA (1992, 2009) and ASTM D6312-17 using verification resampling as discussed below.

2.2.4 False Positive Rate Control

A groundwater monitoring event involves a large number of individual statistical comparisons. For normal prediction limits, if the significance level of an individual statistical comparison (test) is α (defined as the *per-test* false positive rate), the *annual* false positive rate (α^*) is given by (Gibbons 1994):

Equation 1

$$\alpha^* = 1 - (1-\alpha)^r$$

where,

r = the number of annual statistical comparisons to be made
(downgradient monitoring stations × analytes × events per year.

For a typical monitoring scenario, the per-test α is held to a value *no less* than 0.01 (40 CFR 257.93(g)(2). Limiting α to the minimum value of 0.01 guards against an excessive false negative rate, or Type II error, but may result in too large an *event-wide* false positive rate. For each of the 2020 monitoring events there are 21 parameters requiring statistical evaluation (Table J1, c =21). There are three downgradient monitoring wells in the evaluation (Table J1, w = 3). Assuming two annual statistical evaluations, one associated with each sample event (n_E = 2), the number of annual statistical comparisons (r) is equal to c x w x n_E = 126. From Equation 1, the annual false positive rate for the two sampling events is 0.72 Table J1, Row 1. Thus, during each sampling year there would be about a 72 percent probability that a statistically significant result would be obtained even though no real statistical exceedance occurred.

To limit the annual false positive rate to 0.1, as suggested by EPA (2009) (or to a corresponding event-wide false positive rate of 0.05 for semiannual sampling per 40 CFR 257.93(g)(2)), Equation 1 indicates that individual tests would have to be conducted at a significance levels of about 0.00084 (Table J1, Row 2). Very large statistical limits would have to be employed, and the individual *false negative* rate would be unacceptably high at this significance level.

Alternatively, a *verification resampling* strategy is employed to limit the annual-wide false positive rate while maintaining adequate statistical power (EPA 1992, 2009; Gibbons 1994; ASTM 2017). *A statistically significant increase is not declared until both the original sample and some number of verification resamples fail the statistical test procedures*. For the case of one or two verification resampling events, and assuming independence of measurements, α^* may be calculated as (EPA 2009):

Equation 2

$$\alpha^* = 1 - (1-\alpha^m)^r$$

where,

m = the sum of the original sample and number of retest verification samples (1 or 2).

Passing any resample passes the statistical evaluation procedure.

Table J1 Row 3 illustrate a single resample strategy with the resample required to pass. Table J1 Row 4 Row 4 illustrate the case of two verification resamples with one of the two required to pass.

EPA (2009) and 40 CFR 257.93(g)(2) defines two criteria applicable to statistical analysis of groundwater monitoring data:

1. The per-event false positive rate (α^*) shall be no less than 0.05 per evert, or 0.1 annually, and,
2. The per-test false positive rate (α) shall be no less than 0.01.

These criteria were deemed by EPA to provide acceptable balance between false positive rate control and statistical power and are used for this project. The single verification sample resampling strategy (Table J1, Row 3) fits the EPA criteria and minimizes sampling and analytical cost. A single verification

resampling strategy (referred to as “Pass 1 of 2”) using a per-test significance level of 0.02891 is therefore used for this statistical analysis. Reported SSIs

2.3 Comparison to Groundwater Protection Standard

Appendix IV well / constituents with SSIs indicated by the PL analysis were further evaluated to determine whether they are present at statistically significant levels (SSLs) over the groundwater protection standards (GWPSs). This evaluation was conducted by calculating the parametric or non-parametric 95% confidence limits for each well / constituent identified as an SSI using the baseline, detection, and assessment monitoring results collected to date. For a constituent to be present at an SSL over the GWPS, its 95% lower confidence limit must be greater than the GWPS.

3.0 RESULTS

Prediction limit results for the two 2020 sampling events are provided in Tables J2 and J3. Time series plots showing prediction limit results are provided for each downgradient well / parameter in Attachment 1 (April 16, 2020 event) and Attachment 2 (September 24 event). Plots in the attachments are arranged in the constituent order listed in the tables.

Comparison to groundwater protection standard results are provided in Tables J4 and J5.

3.1 Exceedances of Background

Prediction limit test results for the April 16 and September 24, 2020 monitoring events are provided in Tables J2 and J3. Interwell exceedances of the relevant PL values are highlighted. The following SSIs were noted for the April event.

MW-8	boron, calcium, chloride, fluoride, lithium, sulfate, total dissolved solids
MW-9	barium, calcium, chloride, lithium, radium 226+228, total dissolved solids
MW-10	barium, boron, chloride, fluoride, lithium, mercury, pH (field), sulfate, total dissolved solids

Similar results were noted for the September event with exceedances for the following.

MW-8	boron, calcium, chloride, fluoride, lithium, sulfate, total dissolved solids
MW-9	barium, calcium, chloride, radium 226+228
MW-10	boron, chloride, fluoride, lithium, mercury, pH (field), sulfate, total dissolved solids

Results for exceedances of background were generally consistent between the two events and consistent with the 2019 results. Appendix IV SSIs in April occurred for barium at MW-9 and MW-10, fluoride at MW-8 and MW-10, lithium at MW-8, MW-9, and MW-10, mercury at MW-10, and radium 226+228 at MW-9. Appendix IV SSIs in September occurred for barium at MW-9, fluoride at MW-8 and MW-10, lithium at MW-8 and MW-10, mercury at MW-10, and radium 226+228 at MW-9.

3.2 Comparison to Groundwater Protection Standards

Pursuant to 40 CFR 257.95(f) Appendix IV well / parameters with SSIs were further evaluated to determine whether they are present at a statistically significant level over the groundwater protection standard. This analysis was conducted by calculating the parametric or nonparametric 95 percent lower confidence limit (95% LCL) for each well / parameter identified as an SSI for each 2020 event.

The nine Appendix IV statistical SSIs occurring in April are listed in Table J4 showing the 95% LCL computation results compared to the relevant GWPS. The seven Appendix IV statistical SSIs occurring in September are similarly listed in Table J5. The only exceedance of a GWPS is for either 2020 sampling event is for lithium at MW-10. These results are consistent with the 2019 analysis.

4.0 REFERENCES

American Society for Testing and Materials (ASTM), 2017, *Standard Guide for Developing Appropriate Statistical Approaches for Groundwater Detection Monitoring Programs at Waste Disposal Facilities*. Designation D 6312-17.

Gibbons, R.D. 1994. *Statistical Methods in Ground-Water Monitoring*. John Wiley & Sons.

Gilbert, R.O., 1987, Statistical Methods for Environmental Pollution Monitoring: Van Nostrand Reinhold, New York, 320p.

US EPA, 1989, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities, Interim Final Guidance*. Office of Solid Waste Management Division, US EPA, Washington, DC.

-------, 1992, *Statistical Analysis of Ground-Water Monitoring Data at RCRA Facilities: Addendum to Interim Final Guidance,* Office of Solid Waste, Permits and State Programs Division, July.

-------, 2009, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance,* Office of Resource Conservation and Recovery, Program Implementation and Information Division, March.

Tables

Table J1
2020 Annual Monitoring Report
BREC Reid SI
Calculation of False Positive Rates

Row Number	*Number of Downgradient Stations (w)*	*Number of Constituents (c)*	*Number of Annual Evaluations (n_E)*	*Number of Annual Comparisons ($r = w \times c \times n_E$)*	*Target Annual False Positive Rate* (α^*)	*Retest Strategy (1 of m)*	*Individual Comparison False Positive Rate (α)*
1	3	21	2	126	0.72	1	0.01005
2	3	21	2	126	0.1	1	0.00084
3	3	21	2	126	0.1	2	0.02891
4	3	21	2	126	0.1	3	0.09420

Table J2: 2020 Annual Monitoring Report, BREC Reid Surface Impoundmentl, April 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-8	0.0008753	n/a	4/16/2020	0.001ND	No	13	MW-7	0.0002582	0.0002835	38.46	Aitchison`s	No	0.02891	Param Inter
Antimony (mg/L)	MW-9	0.0008753	n/a	4/16/2020	0.001ND	No	13	MW-7	0.0002582	0.0002835	38.46	Aitchison`s	No	0.02891	Param Inter
Antimony (mg/L)	MW-10	0.0008753	n/a	4/16/2020	0.001ND	No	13	MW-7	0.0002582	0.0002835	38.46	Aitchison`s	No	0.02891	Param Inter
Arsenic (mg/L)	MW-8	0.003756	n/a	4/16/2020	0.0002ND	No	13	MW-7	-6.718	0.5209	7.692	None	ln(x)	0.02891	Param Inter
Arsenic (mg/L)	MW-9	0.003756	n/a	4/16/2020	0.0002ND	No	13	MW-7	-6.718	0.5209	7.692	None	ln(x)	0.02891	Param Inter
Arsenic (mg/L)	MW-10	0.003756	n/a	4/16/2020	0.0019	No	13	MW-7	-6.718	0.5209	7.692	None	ln(x)	0.02891	Param Inter
Barium (mg/L)	MW-8	0.08925	n/a	4/16/2020	0.017	No	14	MW-7	0.06616	0.01072	0	None	No	0.02891	Param Inter
Barium (mg/L)	**MW-9**	**0.08925**	**n/a**	**4/16/2020**	**1.06**	**Yes**	**14**	**MW-7**	**0.06616**	**0.01072**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Barium (mg/L)	**MW-10**	**0.08925**	**n/a**	**4/16/2020**	**0.093**	**Yes**	**14**	**MW-7**	**0.06616**	**0.01072**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Beryllium (mg/L)	MW-8	0.0005	n/a	4/16/2020	0.0005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Beryllium (mg/L)	MW-9	0.0005	n/a	4/16/2020	0.0005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Beryllium (mg/L)	MW-10	0.0005	n/a	4/16/2020	0.0005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Boron (mg/L)	**MW-8**	**0.3576**	**n/a**	**4/16/2020**	**1.56**	**Yes**	**13**	**MW-7**	**0.2852**	**0.03326**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Boron (mg/L)	MW-9	0.3576	n/a	4/16/2020	0.32	No	13	MW-7	0.2852	0.03326	0	None	No	0.02891	Param Inter
Boron (mg/L)	**MW-10**	**0.3576**	**n/a**	**4/16/2020**	**0.54**	**Yes**	**13**	**MW-7**	**0.2852**	**0.03326**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Cadmium (mg/L)	MW-8	0.000076	n/a	4/16/2020	0.00005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Cadmium (mg/L)	MW-9	0.000076	n/a	4/16/2020	0.00005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Cadmium (mg/L)	MW-10	0.000076	n/a	4/16/2020	0.00005ND	No	12	MW-7	n/a	n/a	100	n/a	n/a	0.07168	NP Inter (NDs)
Calcium (mg/L)	**MW-8**	**48.58**	**n/a**	**4/16/2020**	**292**	**Yes**	**14**	**MW-7**	**43.4**	**2.403**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Calcium (mg/L)	**MW-9**	**48.58**	**n/a**	**4/16/2020**	**71.2**	**Yes**	**14**	**MW-7**	**43.4**	**2.403**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Calcium (mg/L)	MW-10	48.58	n/a	4/16/2020	12.5	No	14	MW-7	43.4	2.403	0	None	No	0.02891	Param Inter
Chloride (mg/L)	**MW-8**	**7.137**	**n/a**	**4/16/2020**	**47.3**	**Yes**	**14**	**MW-7**	**4.347**	**1.296**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chloride (mg/L)	**MW-9**	**7.137**	**n/a**	**4/16/2020**	**22.8**	**Yes**	**14**	**MW-7**	**4.347**	**1.296**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chloride (mg/L)	**MW-10**	**7.137**	**n/a**	**4/16/2020**	**21.5**	**Yes**	**14**	**MW-7**	**4.347**	**1.296**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chromium (mg/L)	MW-8	0.00171	n/a	4/16/2020	0.0003ND	No	13	MW-7	n/a	n/a	76.92	n/a	n/a	0.06687	NP Inter (NDs)
Chromium (mg/L)	MW-9	0.00171	n/a	4/16/2020	0.0003ND	No	13	MW-7	n/a	n/a	76.92	n/a	n/a	0.06687	NP Inter (NDs)
Chromium (mg/L)	MW-10	0.00171	n/a	4/16/2020	0.0003ND	No	13	MW-7	n/a	n/a	76.92	n/a	n/a	0.06687	NP Inter (NDs)
Cobalt (mg/L)	MW-8	0.00239	n/a	4/16/2020	0.002ND	No	13	MW-7	n/a	n/a	15.38	n/a	n/a	0.06687	NP Inter (xform)
Cobalt (mg/L)	MW-9	0.00239	n/a	4/16/2020	0.002ND	No	13	MW-7	n/a	n/a	15.38	n/a	n/a	0.06687	NP Inter (xform)
Cobalt (mg/L)	MW-10	0.00239	n/a	4/16/2020	0.002ND	No	13	MW-7	n/a	n/a	15.38	n/a	n/a	0.06687	NP Inter (xform)
Fluoride (mg/L)	**MW-8**	**0.3654**	**n/a**	**4/16/2020**	**0.4**	**Yes**	**15**	**MW-7**	**0.2806**	**0.03975**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Fluoride (mg/L)	MW-9	0.3654	n/a	4/16/2020	0.3	No	15	MW-7	0.2806	0.03975	0	None	No	0.02891	Param Inter
Fluoride (mg/L)	**MW-10**	**0.3654**	**n/a**	**4/16/2020**	**0.5**	**Yes**	**15**	**MW-7**	**0.2806**	**0.03975**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Lead (mg/L)	MW-8	0.00064	n/a	4/16/2020	0.00025ND	No	13	MW-7	n/a	n/a	69.23	n/a	n/a	0.06687	NP Inter (NDs)
Lead (mg/L)	MW-9	0.00064	n/a	4/16/2020	0.00025ND	No	13	MW-7	n/a	n/a	69.23	n/a	n/a	0.06687	NP Inter (NDs)
Lead (mg/L)	MW-10	0.00064	n/a	4/16/2020	0.00025ND	No	13	MW-7	n/a	n/a	69.23	n/a	n/a	0.06687	NP Inter (NDs)
Lithium (mg/L)	**MW-8**	**0.00994**	**n/a**	**4/16/2020**	**0.03**	**Yes**	**14**	**MW-7**	**n/a**	**n/a**	**71.43**	**n/a**	**n/a**	**0.06267**	**NP Inter (NDs)**
Lithium (mg/L)	**MW-9**	**0.00994**	**n/a**	**4/16/2020**	**0.01**	**Yes**	**14**	**MW-7**	**n/a**	**n/a**	**71.43**	**n/a**	**n/a**	**0.06267**	**NP Inter (NDs)**
Lithium (mg/L)	**MW-10**	**0.00994**	**n/a**	**4/16/2020**	**0.49**	**Yes**	**14**	**MW-7**	**n/a**	**n/a**	**71.43**	**n/a**	**n/a**	**0.06267**	**NP Inter (NDs)**
Mercury (ug/L)	MW-8	0.135	n/a	4/16/2020	0.1ND	No	12	MW-7	n/a	n/a	91.67	n/a	n/a	0.07168	NP Inter (NDs)
Mercury (ug/L)	MW-9	0.135	n/a	4/16/2020	0.1ND	No	12	MW-7	n/a	n/a	91.67	n/a	n/a	0.07168	NP Inter (NDs)
Mercury (ug/L)	**MW-10**	**0.135**	**n/a**	**4/16/2020**	**0.2**	**Yes**	**12**	**MW-7**	**n/a**	**n/a**	**91.67**	**n/a**	**n/a**	**0.07168**	**NP Inter (NDs)**
Molybdenum (mg/L)	MW-8	0.01826	n/a	4/16/2020	0.01	No	14	MW-7	0.009133	0.00424	0	None	No	0.02891	Param Inter
Molybdenum (mg/L)	MW-9	0.01826	n/a	4/16/2020	0.001ND	No	14	MW-7	0.009133	0.00424	0	None	No	0.02891	Param Inter
Molybdenum (mg/L)	MW-10	0.01826	n/a	4/16/2020	0.006	No	14	MW-7	0.009133	0.00424	0	None	No	0.02891	Param Inter

Table J2: 2020 Annual Monitoring Report, BREC Reid Surface Impoundmentl, April 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
pH [Field] (SU)	MW-8	7.89	6.654	4/16/2020	6.78	No	15	MW-7	7.272	0.2457	0	None	No	0.01446	Param Inter
pH [Field] (SU)	MW-9	7.89	6.654	4/16/2020	7.04	No	15	MW-7	7.272	0.2457	0	None	No	0.01446	Param Inter
pH [Field] (SU)	**MW-10**	**7.89**	**6.654**	**4/16/2020**	**8.87**	**Yes**	**15**	**MW-7**	**7.272**	**0.2457**	**0**	**None**	**No**	**0.01446**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-8	1.958	n/a	4/16/2020	1.93	No	13	MW-7	-0.3211	0.4562	7.692	None	ln(x)	0.02891	Param Inter
Radium 226 + 228 (pCi/L)	**MW-9**	**1.958**	**n/a**	**4/16/2020**	**2.9**	**Yes**	**13**	**MW-7**	**-0.3211**	**0.4562**	**7.692**	**None**	**ln(x)**	**0.02891**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-10	1.958	n/a	4/16/2020	1.24	No	13	MW-7	-0.3211	0.4562	7.692	None	ln(x)	0.02891	Param Inter
Selenium (mg/L)	MW-8	0.00066	n/a	4/16/2020	0.0005ND	No	11	MW-7	n/a	n/a	90.91	n/a	n/a	0.07724	NP Inter (NDs)
Selenium (mg/L)	MW-9	0.00066	n/a	4/16/2020	0.0005ND	No	11	MW-7	n/a	n/a	90.91	n/a	n/a	0.07724	NP Inter (NDs)
Selenium (mg/L)	MW-10	0.00066	n/a	4/16/2020	0.0005ND	No	11	MW-7	n/a	n/a	90.91	n/a	n/a	0.07724	NP Inter (NDs)
Sulfate (mg/L)	**MW-8**	**27.16**	**n/a**	**4/16/2020**	**1130**	**Yes**	**14**	**MW-7**	**18.29**	**4.12**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Sulfate (mg/L)	MW-9	27.16	n/a	4/16/2020	0.25ND	No	14	MW-7	18.29	4.12	0	None	No	0.02891	Param Inter
Sulfate (mg/L)	**MW-10**	**27.16**	**n/a**	**4/16/2020**	**58**	**Yes**	**14**	**MW-7**	**18.29**	**4.12**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Thallium (mg/L)	MW-8	0.000058	n/a	4/16/2020	0.00005ND	No	11	MW-7	n/a	n/a	81.82	n/a	n/a	0.07724	NP Inter (NDs)
Thallium (mg/L)	MW-9	0.000058	n/a	4/16/2020	0.00005ND	No	11	MW-7	n/a	n/a	81.82	n/a	n/a	0.07724	NP Inter (NDs)
Thallium (mg/L)	MW-10	0.000058	n/a	4/16/2020	0.00005ND	No	11	MW-7	n/a	n/a	81.82	n/a	n/a	0.07724	NP Inter (NDs)
Total Dissolved Solids (mg/L)	**MW-8**	**310.7**	**n/a**	**4/16/2020**	**1930**	**Yes**	**13**	**MW-7**	**261.9**	**22.4**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-9**	**310.7**	**n/a**	**4/16/2020**	**320**	**Yes**	**13**	**MW-7**	**261.9**	**22.4**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Total Dissolved Solids (mg/L)	**MW-10**	**310.7**	**n/a**	**4/16/2020**	**466**	**Yes**	**13**	**MW-7**	**261.9**	**22.4**	**0**	**None**	**No**	**0.02891**	**Param Inter**

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Inter - Parametric interstation prediction limit
n/a - not applicable
ND - Compound not detected, preceding number is one-half the reporting limit.
NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.
NDs - background data contain too high a percentage of non-detect values.
Param - Parametric Prediction Limit

Table J3: 2020 Annual Monitoring Report, BREC Reid Surface Impoundment, September 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
Antimony (mg/L)	MW-8	0.0008449	n/a	9/24/2020	0.001ND	No	14	MW-7	0.0002398	0.000281	42.86	Aitchison`s	No	0.02891	Param Inter
Antimony (mg/L)	MW-9	0.0008449	n/a	9/24/2020	0.001ND	No	14	MW-7	0.0002398	0.000281	42.86	Aitchison`s	No	0.02891	Param Inter
Antimony (mg/L)	MW-10	0.0008449	n/a	9/24/2020	0.001ND	No	14	MW-7	0.0002398	0.000281	42.86	Aitchison`s	No	0.02891	Param Inter
Arsenic (mg/L)	MW-8	0.003633	n/a	9/24/2020	0.0002ND	No	14	MW-7	-6.703	0.5038	7.143	None	ln(x)	0.02891	Param Inter
Arsenic (mg/L)	MW-9	0.003633	n/a	9/24/2020	0.0002ND	No	14	MW-7	-6.703	0.5038	7.143	None	ln(x)	0.02891	Param Inter
Arsenic (mg/L)	MW-10	0.003633	n/a	9/24/2020	0.0019	No	14	MW-7	-6.703	0.5038	7.143	None	ln(x)	0.02891	Param Inter
Barium (mg/L)	MW-8	0.08933	n/a	9/24/2020	0.016	No	15	MW-7	0.06675	0.01058	0	None	No	0.02891	Param Inter
Barium (mg/L)	**MW-9**	**0.08933**	**n/a**	**9/24/2020**	**0.73**	**Yes**	**15**	**MW-7**	**0.06675**	**0.01058**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Barium (mg/L)	MW-10	0.08933	n/a	9/24/2020	0.084	No	15	MW-7	0.06675	0.01058	0	None	No	0.02891	Param Inter
Beryllium (mg/L)	MW-8	0.0005	n/a	9/24/2020	0.0005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Beryllium (mg/L)	MW-9	0.0005	n/a	9/24/2020	0.0005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Beryllium (mg/L)	MW-10	0.0005	n/a	9/24/2020	0.0005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Boron (mg/L)	**MW-8**	**0.3619**	**n/a**	**9/24/2020**	**1.41**	**Yes**	**14**	**MW-7**	**0.2884**	**0.03412**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Boron (mg/L)	MW-9	0.3619	n/a	9/24/2020	0.22	No	14	MW-7	0.2884	0.03412	0	None	No	0.02891	Param Inter
Boron (mg/L)	**MW-10**	**0.3619**	**n/a**	**9/24/2020**	**0.51**	**Yes**	**14**	**MW-7**	**0.2884**	**0.03412**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Cadmium (mg/L)	MW-8	0.000076	n/a	9/24/2020	0.00005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Cadmium (mg/L)	MW-9	0.000076	n/a	9/24/2020	0.00005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Cadmium (mg/L)	MW-10	0.000076	n/a	9/24/2020	0.00005ND	No	13	MW-7	n/a	n/a	100	n/a	n/a	0.06687	NP Inter (NDs)
Calcium (mg/L)	**MW-8**	**48.31**	**n/a**	**9/24/2020**	**257**	**Yes**	**15**	**MW-7**	**43.29**	**2.352**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Calcium (mg/L)	**MW-9**	**48.31**	**n/a**	**9/24/2020**	**65.3**	**Yes**	**15**	**MW-7**	**43.29**	**2.352**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Calcium (mg/L)	MW-10	48.31	n/a	9/24/2020	8.8	No	15	MW-7	43.29	2.352	0	None	No	0.02891	Param Inter
Chloride (mg/L)	**MW-8**	**7.004**	**n/a**	**9/24/2020**	**49.2**	**Yes**	**15**	**MW-7**	**4.277**	**1.277**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chloride (mg/L)	**MW-9**	**7.004**	**n/a**	**9/24/2020**	**19.9**	**Yes**	**15**	**MW-7**	**4.277**	**1.277**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chloride (mg/L)	**MW-10**	**7.004**	**n/a**	**9/24/2020**	**21.4**	**Yes**	**15**	**MW-7**	**4.277**	**1.277**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Chromium (mg/L)	MW-8	0.00171	n/a	9/24/2020	0.0003ND	No	14	MW-7	n/a	n/a	78.57	n/a	n/a	0.06267	NP Inter (NDs)
Chromium (mg/L)	MW-9	0.00171	n/a	9/24/2020	0.0003ND	No	14	MW-7	n/a	n/a	78.57	n/a	n/a	0.06267	NP Inter (NDs)
Chromium (mg/L)	MW-10	0.00171	n/a	9/24/2020	0.0006	No	14	MW-7	n/a	n/a	78.57	n/a	n/a	0.06267	NP Inter (NDs)
Cobalt (mg/L)	MW-8	0.00239	n/a	9/24/2020	0.002ND	No	14	MW-7	n/a	n/a	21.43	n/a	n/a	0.06267	NP Inter (xform)
Cobalt (mg/L)	MW-9	0.00239	n/a	9/24/2020	0.002ND	No	14	MW-7	n/a	n/a	21.43	n/a	n/a	0.06267	NP Inter (xform)
Cobalt (mg/L)	MW-10	0.00239	n/a	9/24/2020	0.002ND	No	14	MW-7	n/a	n/a	21.43	n/a	n/a	0.06267	NP Inter (xform)
Fluoride (mg/L)	**MW-8**	**0.3638**	**n/a**	**9/24/2020**	**0.4**	**Yes**	**16**	**MW-7**	**0.2818**	**0.03871**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Fluoride (mg/L)	MW-9	0.3638	n/a	9/24/2020	0.3	No	16	MW-7	0.2818	0.03871	0	None	No	0.02891	Param Inter
Fluoride (mg/L)	**MW-10**	**0.3638**	**n/a**	**9/24/2020**	**0.5**	**Yes**	**16**	**MW-7**	**0.2818**	**0.03871**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Lead (mg/L)	MW-8	0.00064	n/a	9/24/2020	0.00025ND	No	14	MW-7	n/a	n/a	71.43	n/a	n/a	0.06267	NP Inter
Lead (mg/L)	MW-9	0.00064	n/a	9/24/2020	0.00025ND	No	14	MW-7	n/a	n/a	71.43	n/a	n/a	0.06267	NP Inter
Lead (mg/L)	MW-10	0.00064	n/a	9/24/2020	0.00025ND	No	14	MW-7	n/a	n/a	71.43	n/a	n/a	0.06267	NP Inter
Lithium (mg/L)	**MW-8**	**0.00994**	**n/a**	**9/24/2020**	**0.03**	**Yes**	**15**	**MW-7**	**n/a**	**n/a**	**66.67**	**n/a**	**n/a**	**0.05896**	**NP Inter**
Lithium (mg/L)	MW-9	0.00994	n/a	9/24/2020	0.009	No	15	MW-7	n/a	n/a	66.67	n/a	n/a	0.05896	NP Inter
Lithium (mg/L)	**MW-10**	**0.00994**	**n/a**	**9/24/2020**	**0.56**	**Yes**	**15**	**MW-7**	**n/a**	**n/a**	**66.67**	**n/a**	**n/a**	**0.05896**	**NP Inter**
Mercury (ug/L)	MW-8	0.135	n/a	9/24/2020	0.1ND	No	13	MW-7	n/a	n/a	92.31	n/a	n/a	0.06687	NP Inter
Mercury (ug/L)	MW-9	0.135	n/a	9/24/2020	0.1ND	No	13	MW-7	n/a	n/a	92.31	n/a	n/a	0.06687	NP Inter
Mercury (ug/L)	**MW-10**	**0.135**	**n/a**	**9/24/2020**	**0.2**	**Yes**	**13**	**MW-7**	**n/a**	**n/a**	**92.31**	**n/a**	**n/a**	**0.06687**	**NP Inter**
Molybdenum (mg/L)	MW-8	0.01781	n/a	9/24/2020	0.01	No	15	MW-7	0.008924	0.004165	0	None	No	0.02891	Param Inter
Molybdenum (mg/L)	MW-9	0.01781	n/a	9/24/2020	0.001ND	No	15	MW-7	0.008924	0.004165	0	None	No	0.02891	Param Inter
Molybdenum (mg/L)	MW-10	0.01781	n/a	9/24/2020	0.007	No	15	MW-7	0.008924	0.004165	0	None	No	0.02891	Param Inter

Table J3: 2020 Annual Monitoring Report, BREC Reid Surface Impoundment, September 2020 Prediction Limit Results

Constituent Name	Station	Upper Limit	Lower Limit	Date	Observation	Exceeds	Background N	Background Stations	Background Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transformation	Alpha	Method
pH [Field] (SU)	MW-8	7.966	6.489	9/24/2020	6.58	No	16	MW-7	7.228	0.2967	0	None	No	0.01446	Param Inter
pH [Field] (SU)	MW-9	7.966	6.489	9/24/2020	6.67	No	16	MW-7	7.228	0.2967	0	None	No	0.01446	Param Inter
pH [Field] (SU)	**MW-10**	**7.966**	**6.489**	**9/24/2020**	**8.74**	**Yes**	**16**	**MW-7**	**7.228**	**0.2967**	**0**	**None**	**No**	**0.01446**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-8	1.169	n/a	9/24/2020	0.366	No	12	MW-7	0.7699	0.1811	0	None	No	0.02891	Param Inter
Radium 226 + 228 (pCi/L)	**MW-9**	**1.169**	**n/a**	**9/24/2020**	**3.44**	**Yes**	**12**	**MW-7**	**0.7699**	**0.1811**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Radium 226 + 228 (pCi/L)	MW-10	1.169	n/a	9/24/2020	0.594	No	12	MW-7	0.7699	0.1811	0	None	No	0.02891	Param Inter
Selenium (mg/L)	MW-8	0.00066	n/a	9/24/2020	0.0005ND	No	12	MW-7	n/a	n/a	91.67	n/a	n/a	0.07168	NP Inter (NDs)
Selenium (mg/L)	MW-9	0.00066	n/a	9/24/2020	0.0005ND	No	12	MW-7	n/a	n/a	91.67	n/a	n/a	0.07168	NP Inter (NDs)
Selenium (mg/L)	MW-10	0.00066	n/a	9/24/2020	0.0005ND	No	12	MW-7	n/a	n/a	91.67	n/a	n/a	0.07168	NP Inter (NDs)
Sulfate (mg/L)	**MW-8**	**27.02**	**n/a**	**9/24/2020**	**1400**	**Yes**	**15**	**MW-7**	**17.87**	**4.289**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Sulfate (mg/L)	MW-9	27.02	n/a	9/24/2020	0.25ND	No	15	MW-7	17.87	4.289	0	None	No	0.02891	Param Inter
Sulfate (mg/L)	**MW-10**	**27.02**	**n/a**	**9/24/2020**	**62**	**Yes**	**15**	**MW-7**	**17.87**	**4.289**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Thallium (mg/L)	MW-8	0.000058	n/a	9/24/2020	0.00005ND	No	12	MW-7	n/a	n/a	83.33	n/a	n/a	0.07168	NP Inter (NDs)
Thallium (mg/L)	MW-9	0.000058	n/a	9/24/2020	0.00005ND	No	12	MW-7	n/a	n/a	83.33	n/a	n/a	0.07168	NP Inter (NDs)
Thallium (mg/L)	MW-10	0.000058	n/a	9/24/2020	0.00005ND	No	12	MW-7	n/a	n/a	83.33	n/a	n/a	0.07168	NP Inter (NDs)
Total Dissolved Solids (mg/L)	**MW-8**	**310.7**	**n/a**	**9/24/2020**	**1940**	**Yes**	**13**	**MW-7**	**261.9**	**22.4**	**0**	**None**	**No**	**0.02891**	**Param Inter**
Total Dissolved Solids (mg/L)	MW-9	310.7	n/a	9/24/2020	308	No	13	MW-7	261.9	22.4	0	None	No	0.02891	Param Inter
Total Dissolved Solids (mg/L)	**MW-10**	**310.7**	**n/a**	**9/24/2020**	**436**	**Yes**	**13**	**MW-7**	**261.9**	**22.4**	**0**	**None**	**No**	**0.02891**	**Param Inter**

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Normal and field duplicate samples averaged, where applicable
Inter - Parametric interstation prediction limit
n/a - not applicable
ND - Compound not detected, preceding number is one-half the reporting limit.
NP Inter - Non-parametric interstation prediction limit. Text in parenthesis indicates reason for non-parametric determination, as follows.
NDs - background data contain too high a percentage of non-detect values.
Param - Parametric Prediction Limit

Table J4: 2020 Annual Monitoring Report, BREC Reid Surface Impoundment, April 2020 Comparison of 95% LCL to GWPS

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
Barium (mg/L)	MW-9	1.03	0.635	2	No	14	0.7628	0.3039	0	None	No	0.05	NP (selected)
Barium (mg/L)	MW-10	0.08562	0.06273	2	No	14	0.07417	0.02418	0	None	No	0.05	Param.
Fluoride (mg/L)	MW-8	0.498	0.404	4	No	15	0.4679	0.1044	0	None	No	0.05	NP (selected)
Fluoride (mg/L)	MW-10	0.5745	0.4874	4	No	15	0.5309	0.09571	0	None	No	0.05	Param.
Lithium (mg/L)	MW-8	0.03651	0.03333	0.04	No	14	0.03492	0.003354	0	None	No	0.05	Param.
Lithium (mg/L)	MW-9	0.01199	0.006754	0.04	No	14	0.0104	0.003744	21.43	Aitchison`s	No	0.05	Param.
Lithium (mg/L)	**MW-10**	**0.5154**	**0.3326**	**0.04**	**Yes**	**14**	**0.424**	**0.1931**	**0**	**None**	**No**	**0.05**	**Param.**
Mercury (ug/L)	MW-10	0.122	0.05	2	No	12	0.0796	0.06028	75	None	No	0.05	NP (NDs)
Radium 226 + 228 (pCi/L)	MW-9	2.453	1.793	5	No	13	2.123	0.6676	0	None	No	0.05	Param.

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
NP - Non-parametric Confidence Limit
Param - Parametric Confidence Limit

Table J5: 2020 Annual Monitoring Report, BREC Reid Surface Impoundment, September 2020 Comparison of 95% LCL to GWPS

Constituent Name	Well	Upper Limit	Lower Limit	GWPS	Exceeds	N	Mean	Standard Deviation	% Non-detects	Non-detect Adjustment	Transform	Alpha	Method
Barium (mg/L)	MW-9	0.967	0.635	2	No	15	0.7606	0.2929	0	None	No	0.05	NP (selected)
Fluoride (mg/L)	MW-8	0.488	0.4	4	No	16	0.4637	0.1023	0	None	No	0.05	NP (selected)
Fluoride (mg/L)	MW-10	0.5697	0.4883	4	No	16	0.529	0.09278	0	None	No	0.05	Param.
Lithium (mg/L)	MW-8	0.03617	0.03301	0.04	No	15	0.03459	0.003473	0	None	No	0.05	Param.
Lithium (mg/L)	**MW-10**	**0.5192**	**0.3469**	**0.04**	**Yes**	**15**	**0.433**	**0.1894**	**0**	**None**	**No**	**0.05**	**Param.**
Mercury (ug/L)	MW-10	0.122	0.05	2	No	13	0.08886	0.06668	69.23	None	No	0.05	NP (NDs)
Radium 226 + 228 (pCi/L)	MW-9	2.563	1.871	5	No	14	2.217	0.7317	0	None	No	0.05	Param.

Notes:
Concentration units are as specified in Column 1.
mg/L - milligram per liter
ug/L - microgram per liter
Normal and field duplicate samples averaged, where applicable
NP - Non-parametric Confidence Limit
Param - Parametric Confidence Limit

Attachment 1

April 2020 Time Series Plots

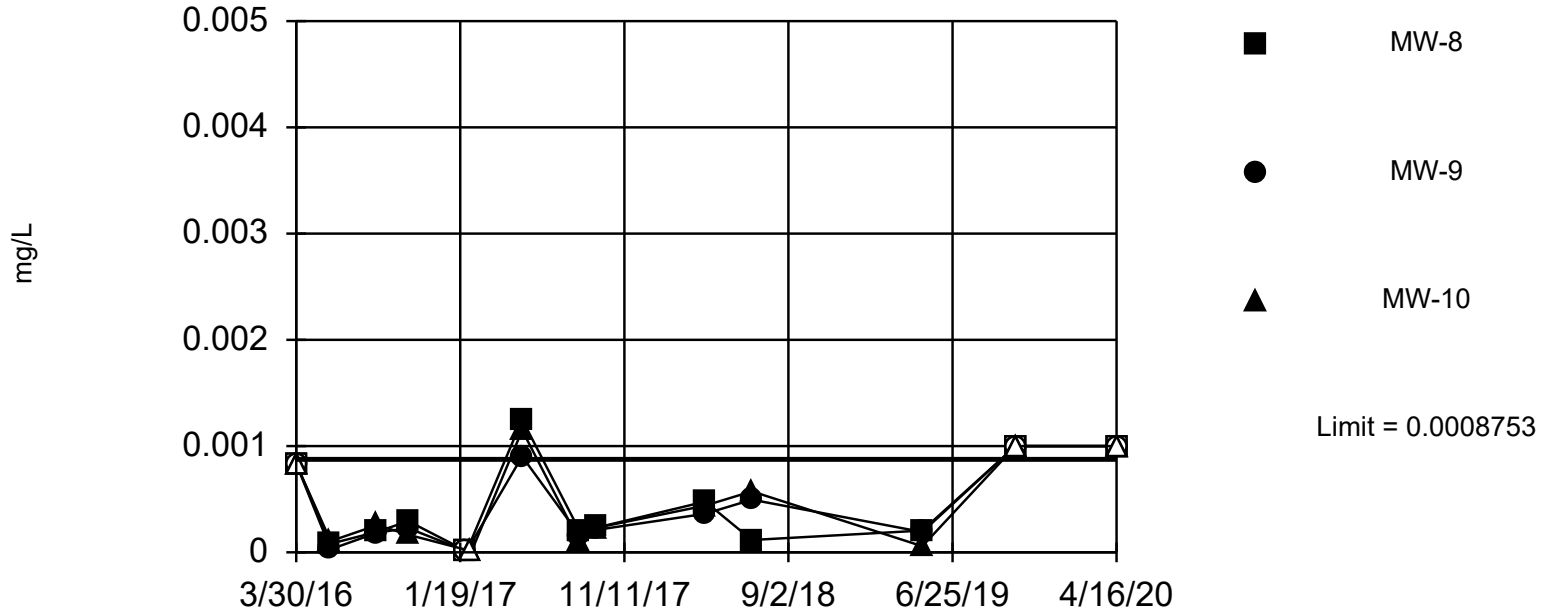
And Prediction Limit Results

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0002582, Std. Dev.=0.0002835, n=13, 38.46% NDs. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Antimony Analysis Run 11/24/2020 11:36 AM

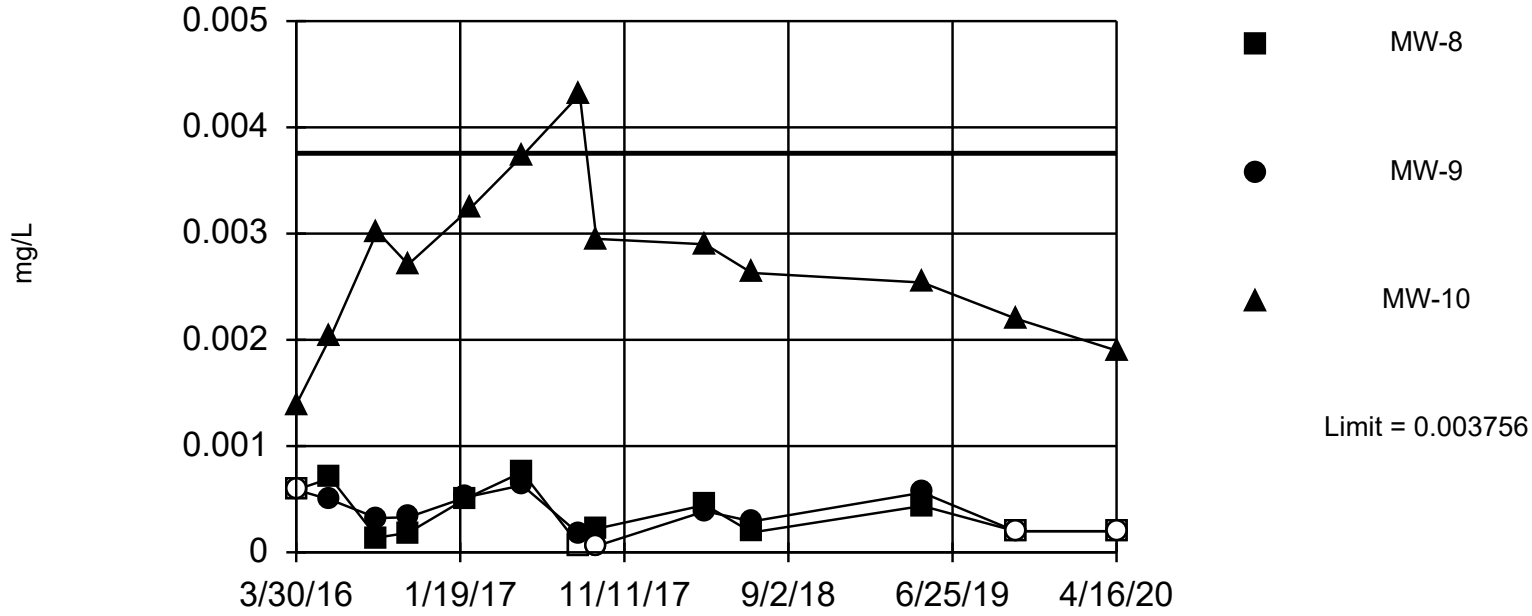
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-6.718, Std. Dev.=0.5209, n=13, 7.692% NDs. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

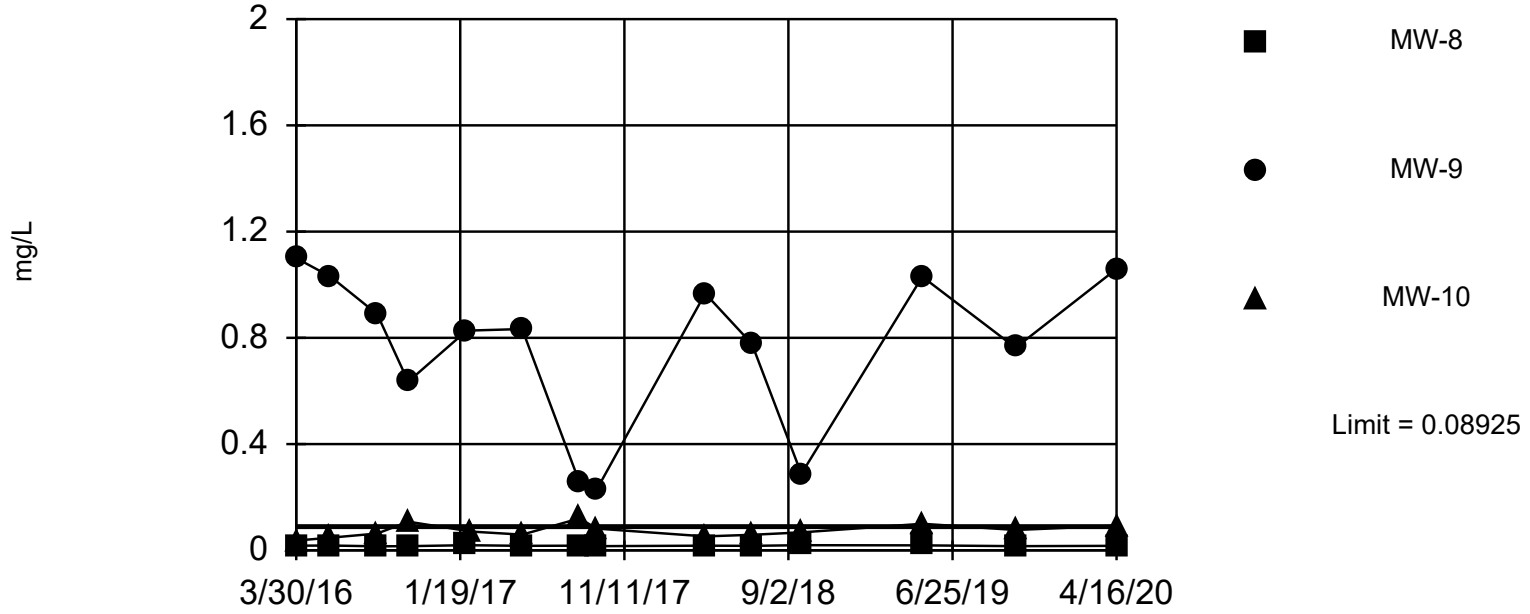
Constituent: Arsenic Analysis Run 11/24/2020 11:40 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-9, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.06616, Std. Dev.=0.01072, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 11/24/2020 12:02 PM

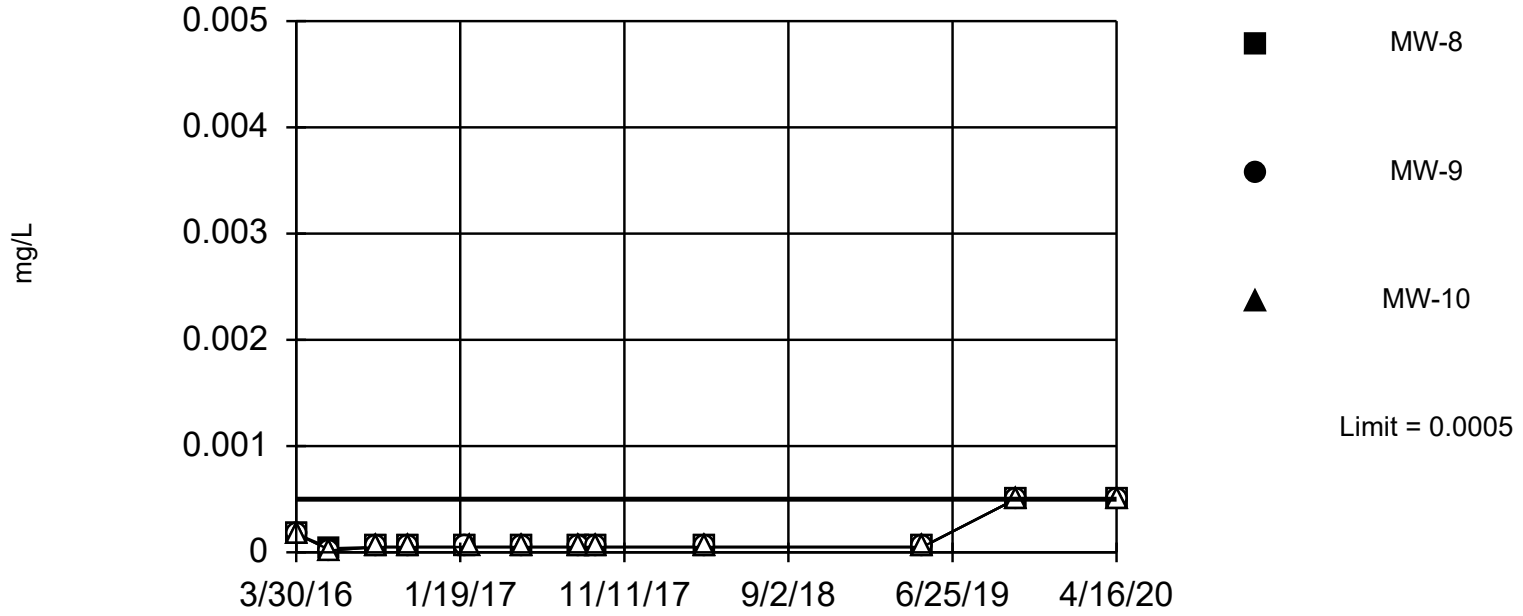
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 100% NDs. Report alpha = 0.2. Individual comparison alpha = 0.07168. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Beryllium Analysis Run 11/24/2020 12:05 PM

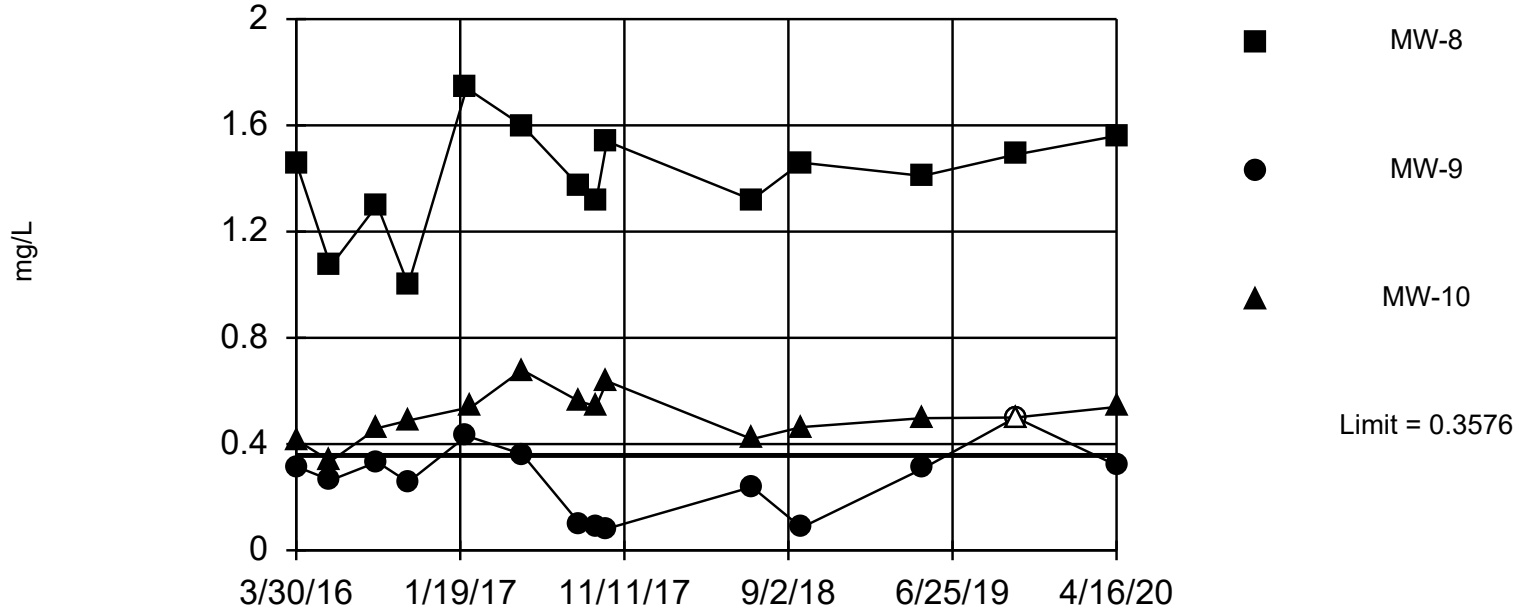
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2852, Std. Dev.=0.03326, n=13. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: <1 (10/16/2019).

Constituent: Boron Analysis Run 11/24/2020 12:14 PM

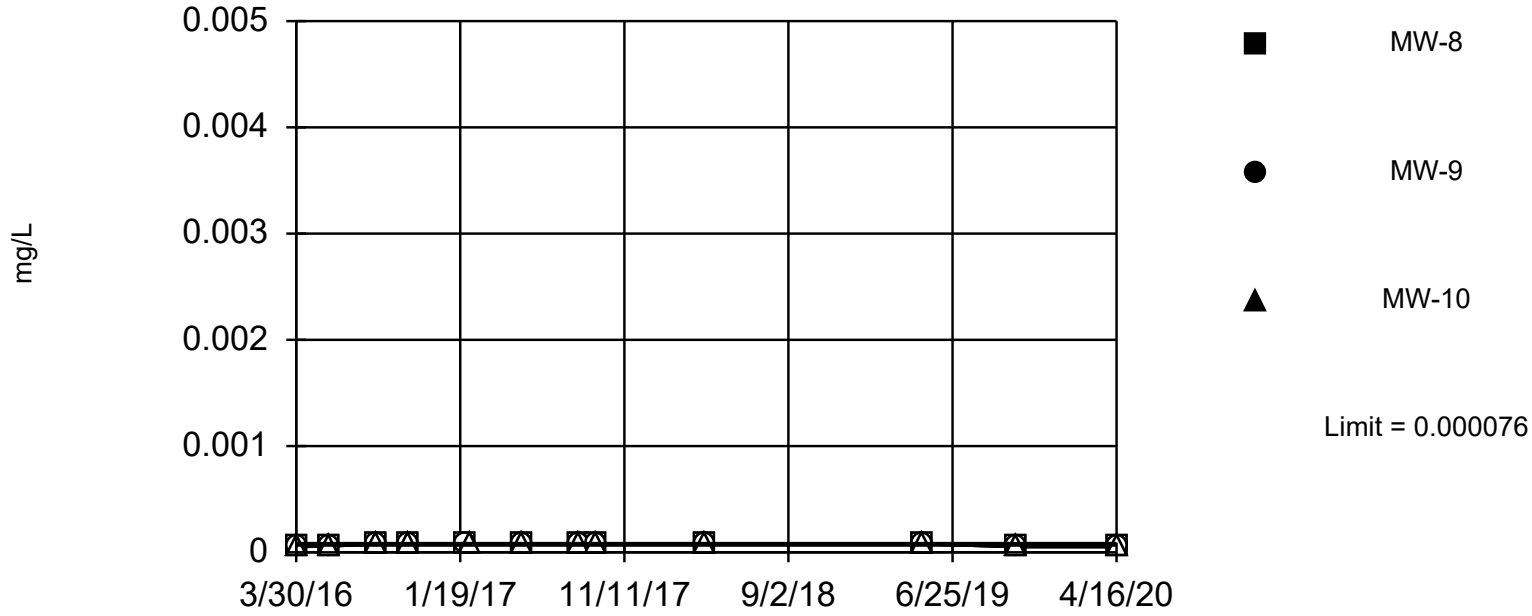
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 100% NDs. Report alpha = 0.2. Individual comparison alpha = 0.07168. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

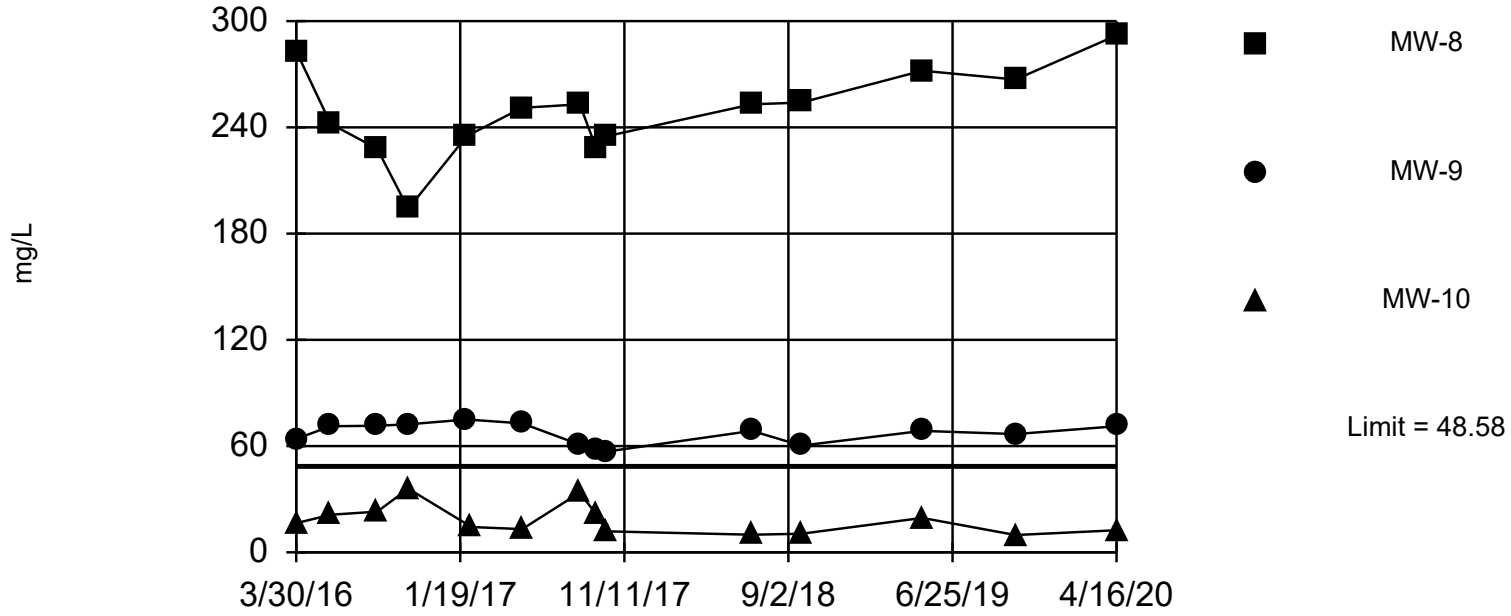
Constituent: Cadmium Analysis Run 11/24/2020 12:13 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-9

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=43.4, Std. Dev.=2.403, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

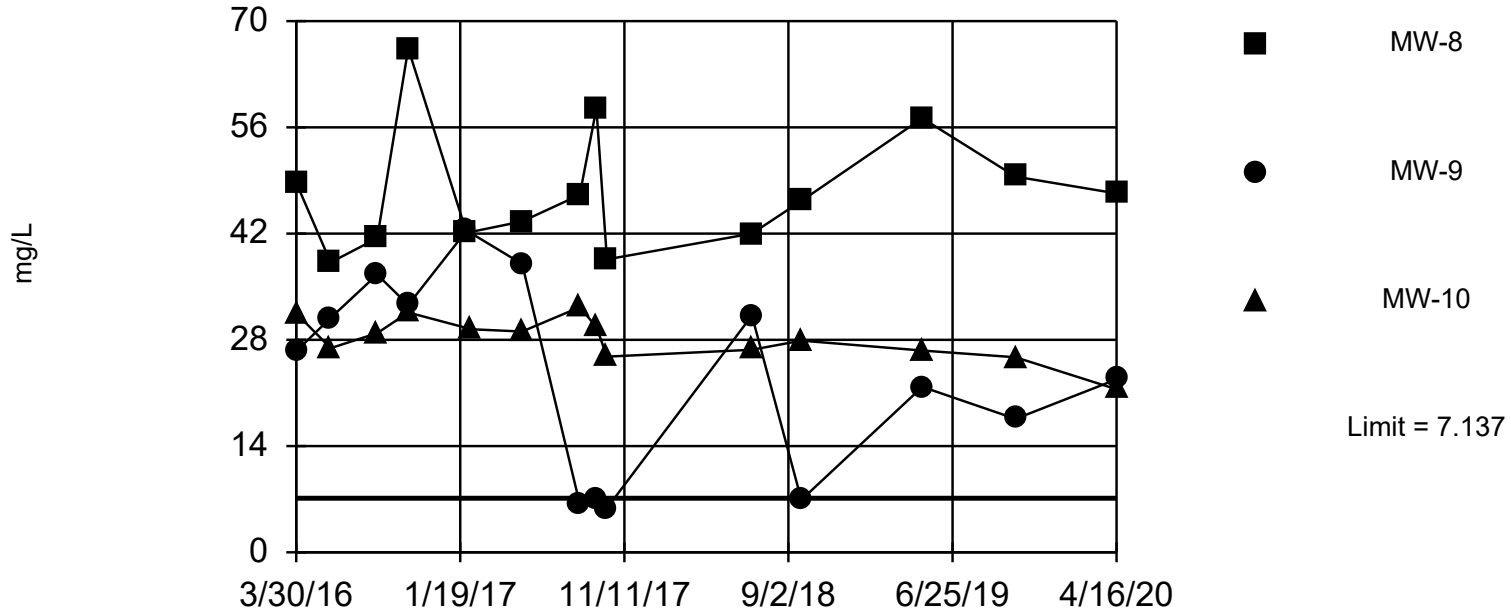
Constituent: Calcium Analysis Run 11/24/2020 12:18 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-9, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.347, Std. Dev.=1.296, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Chloride Analysis Run 11/24/2020 12:22 PM

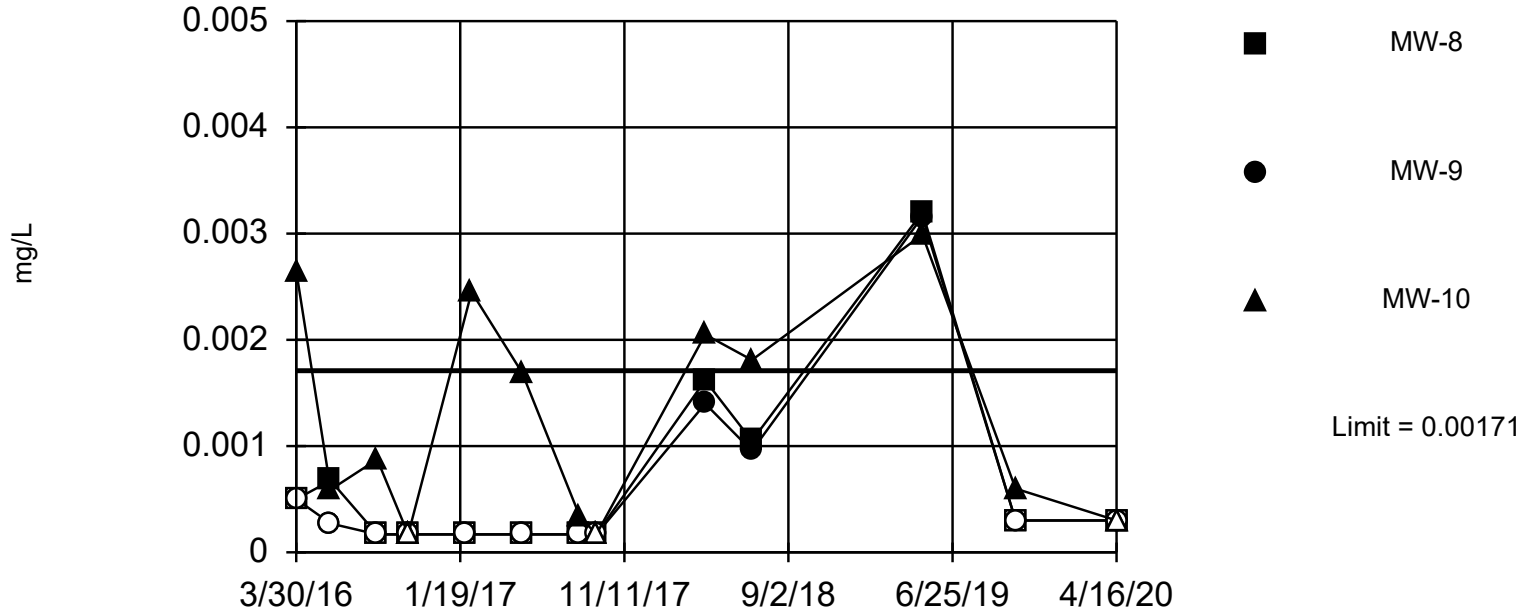
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 76.92% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Chromium Analysis Run 11/24/2020 12:24 PM

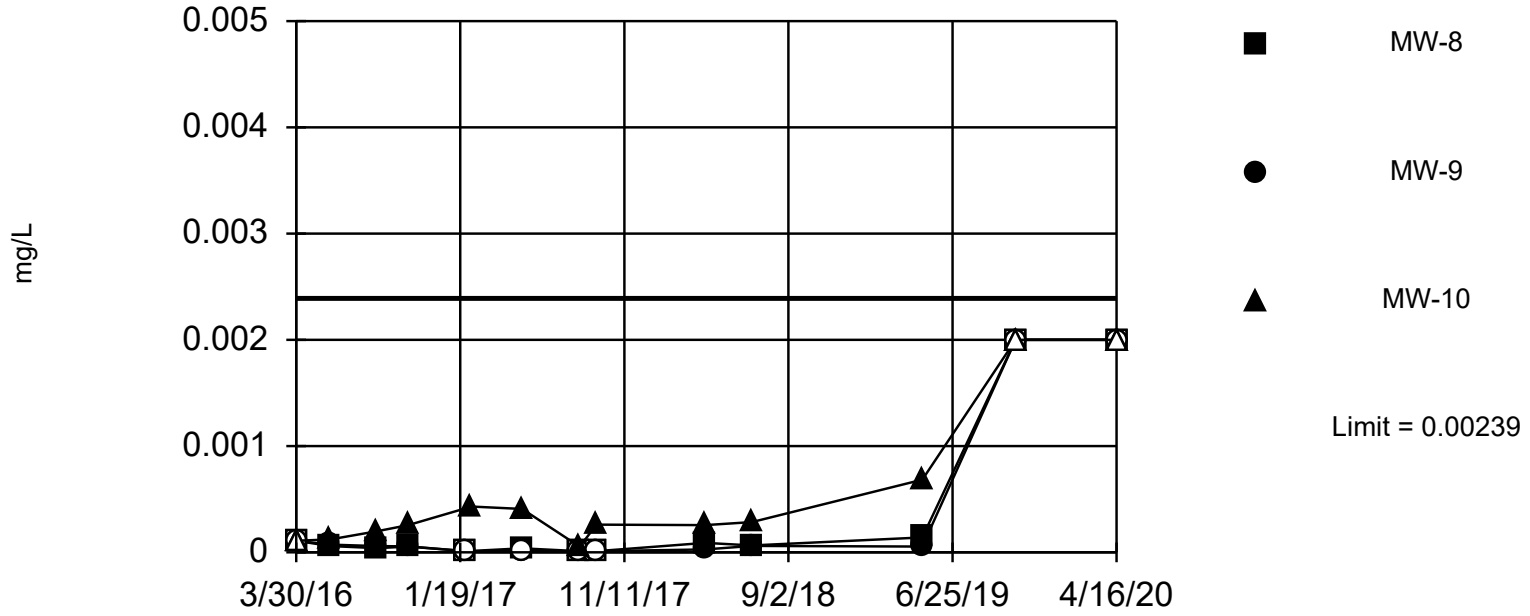
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 0.9423, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 13 background values. 15.38% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

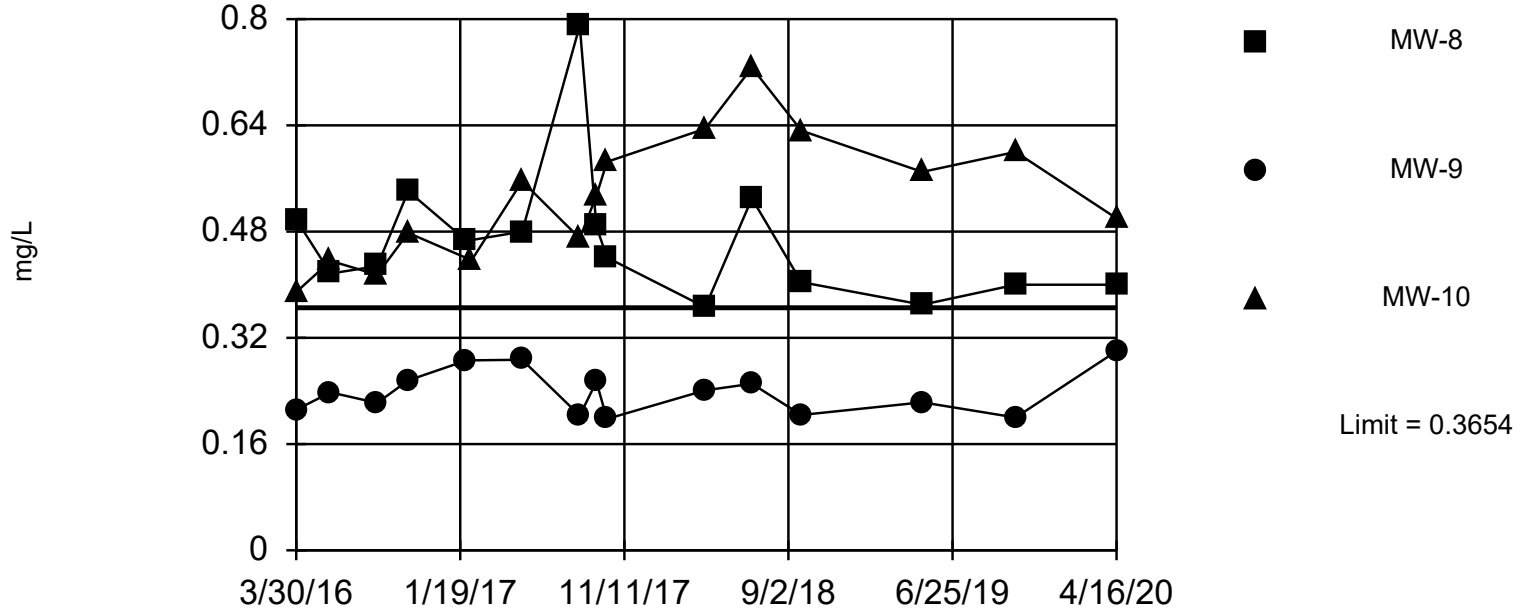
Constituent: Cobalt Analysis Run 11/24/2020 12:27 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2806, Std. Dev.=0.03975, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Fluoride Analysis Run 11/24/2020 12:29 PM

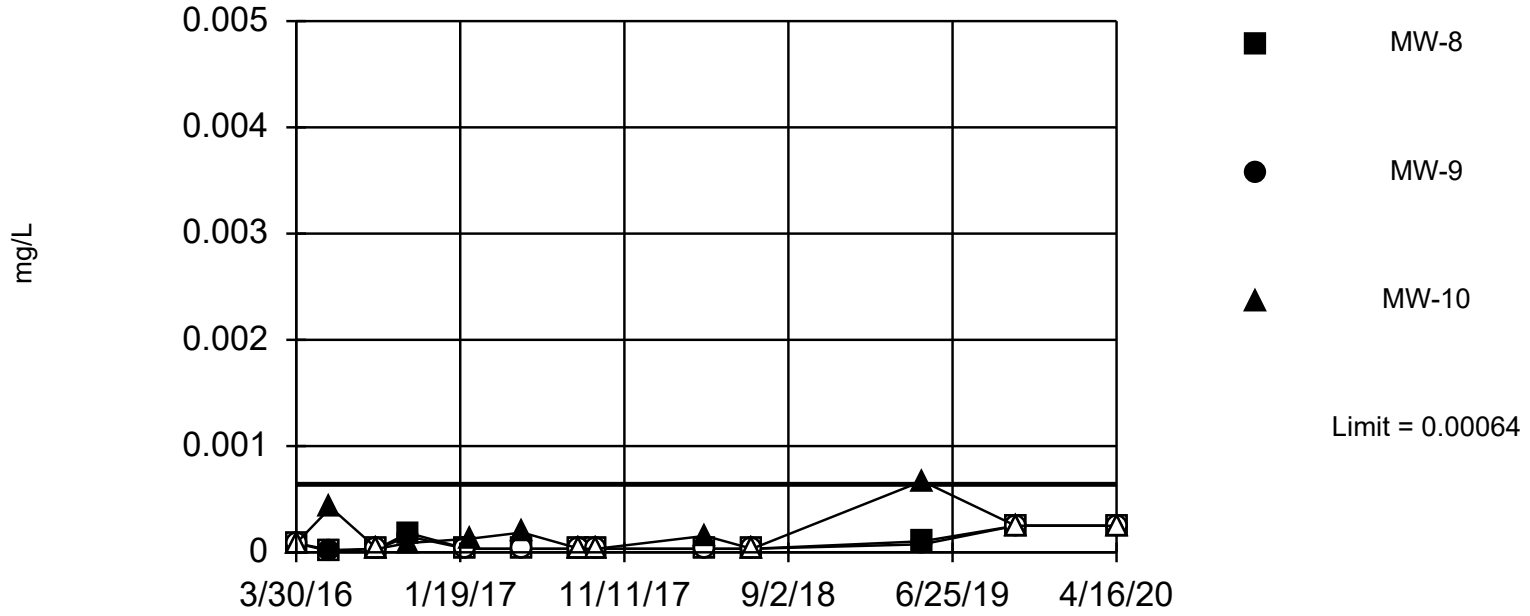
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 69.23% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lead Analysis Run 11/24/2020 12:31 PM

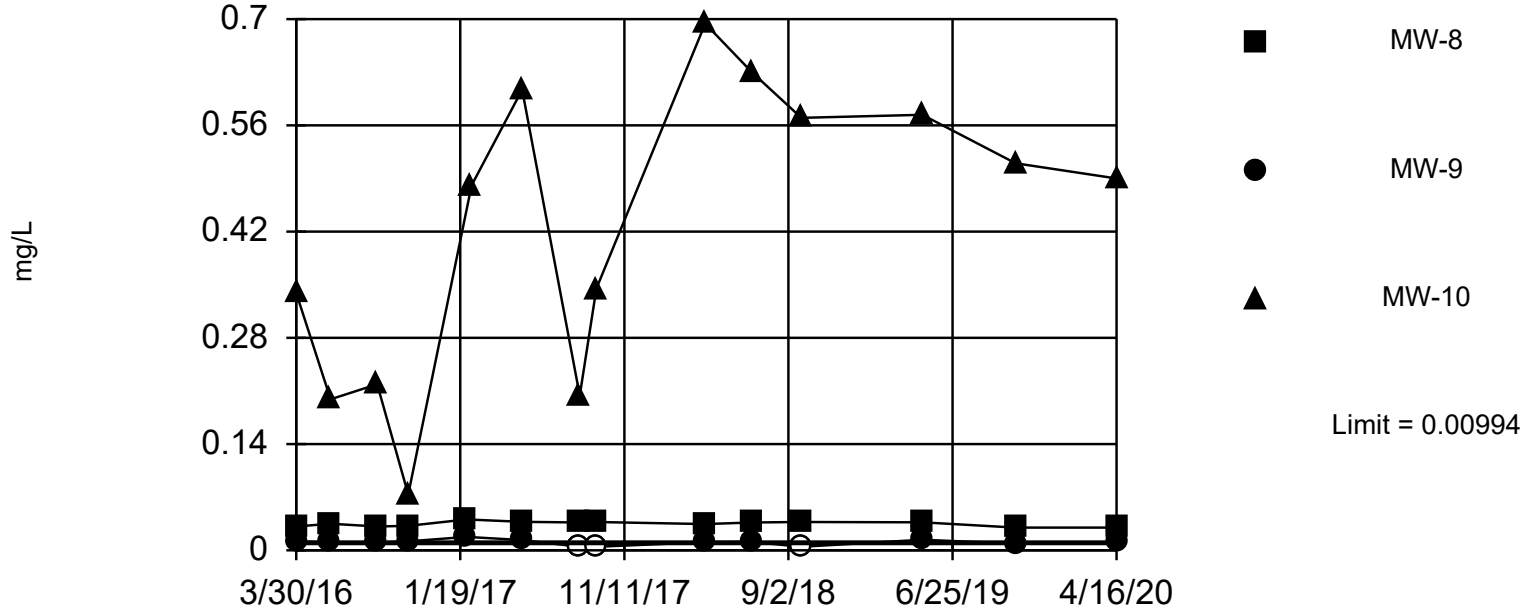
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-9, MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 71.43% NDs. Report alpha = 0.1765. Individual comparison alpha = 0.06267. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lithium Analysis Run 11/24/2020 12:33 PM

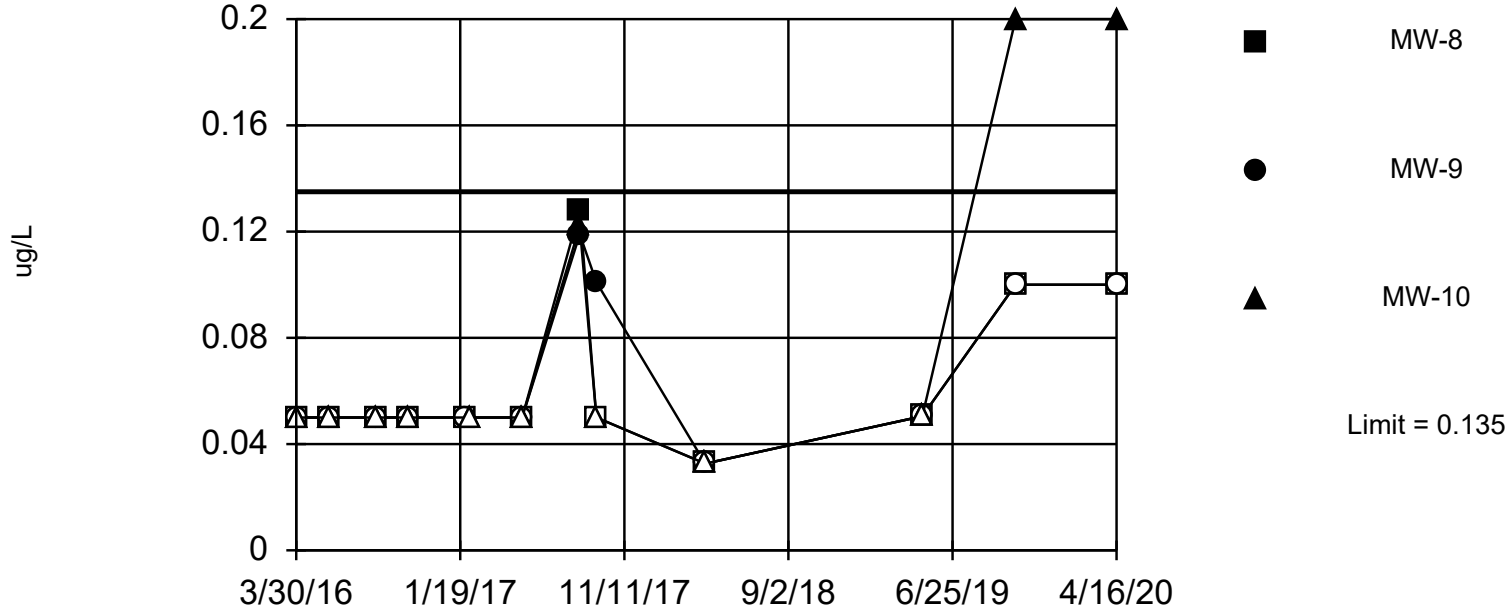
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-10

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.2. Individual comparison alpha = 0.07168. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Mercury Analysis Run 11/24/2020 12:36 PM

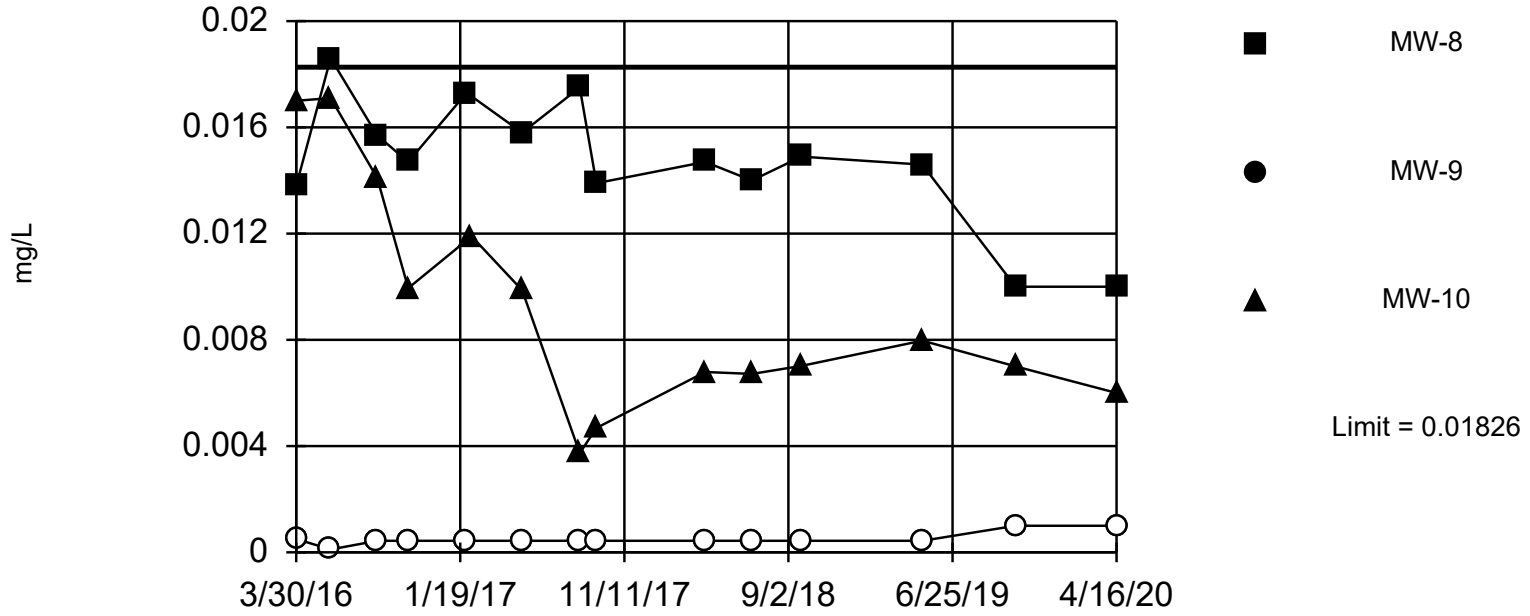
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.009133, Std. Dev.=0.00424, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

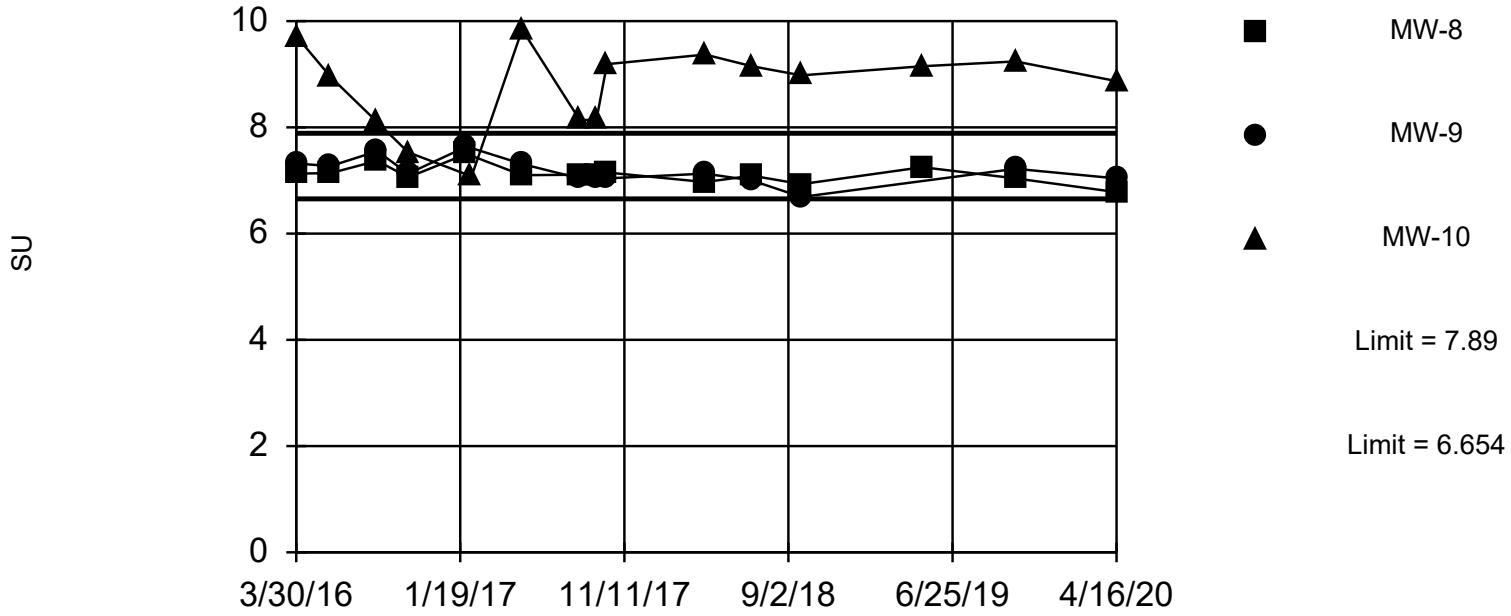
Constituent: Molybdenum Analysis Run 11/24/2020 12:42 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limits: MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=7.272, Std. Dev.=0.2457, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.01446. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: pH [Field] Analysis Run 11/24/2020 12:44 PM

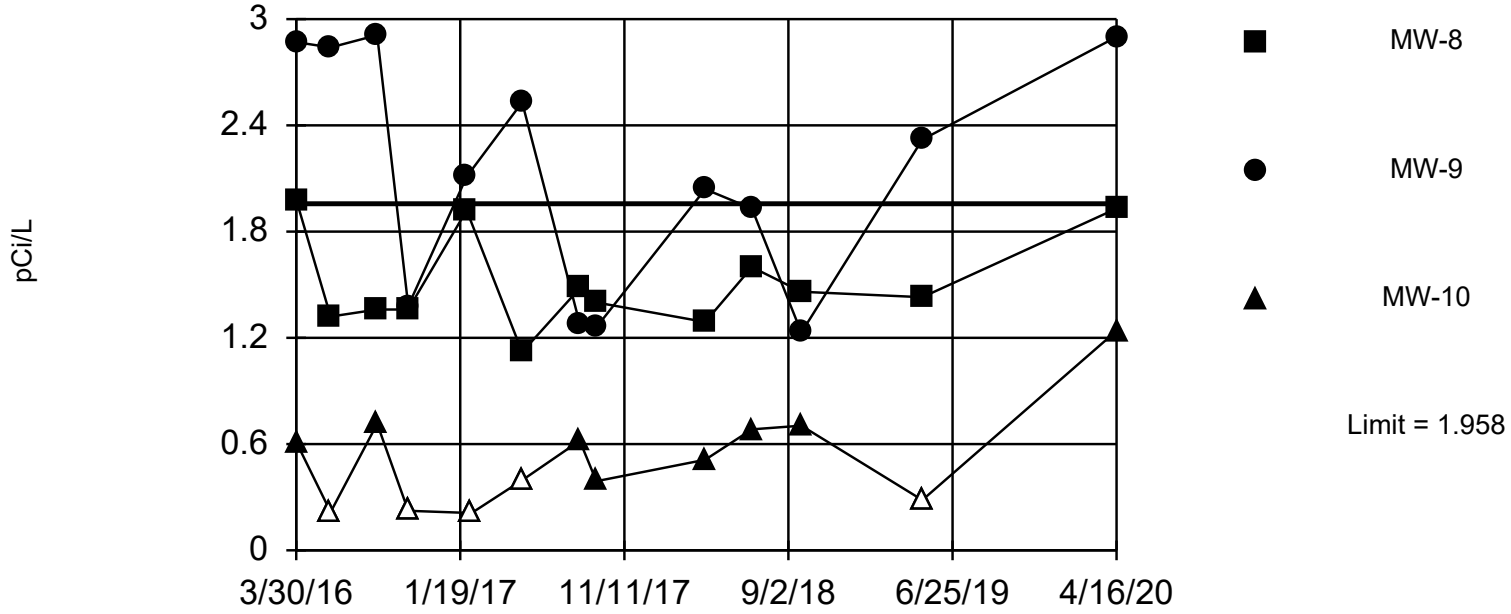
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-9

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-0.3211, Std. Dev.=0.4562, n=13, 7.692% NDs. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Radium 226 + 228 Analysis Run 11/24/2020 12:50 PM

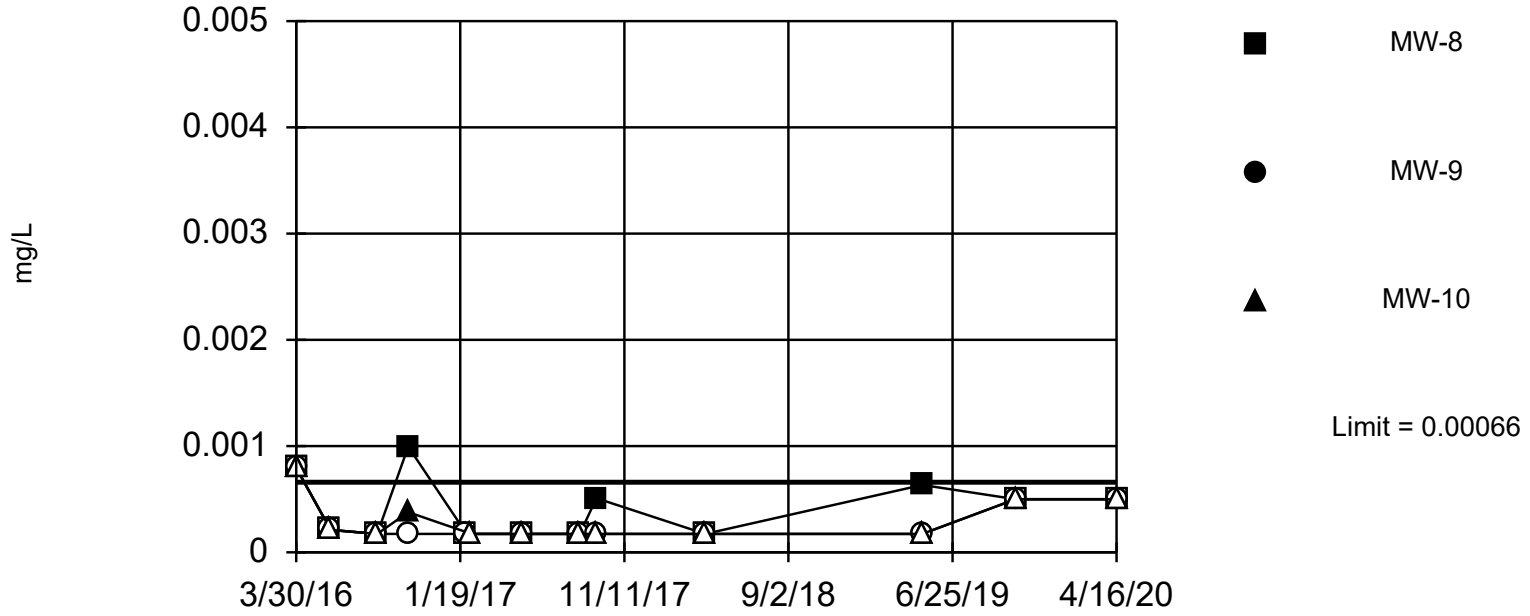
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 11 background values. 90.91% NDs. Report alpha = 0.2143. Individual comparison alpha = 0.07724. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Selenium Analysis Run 11/24/2020 12:53 PM

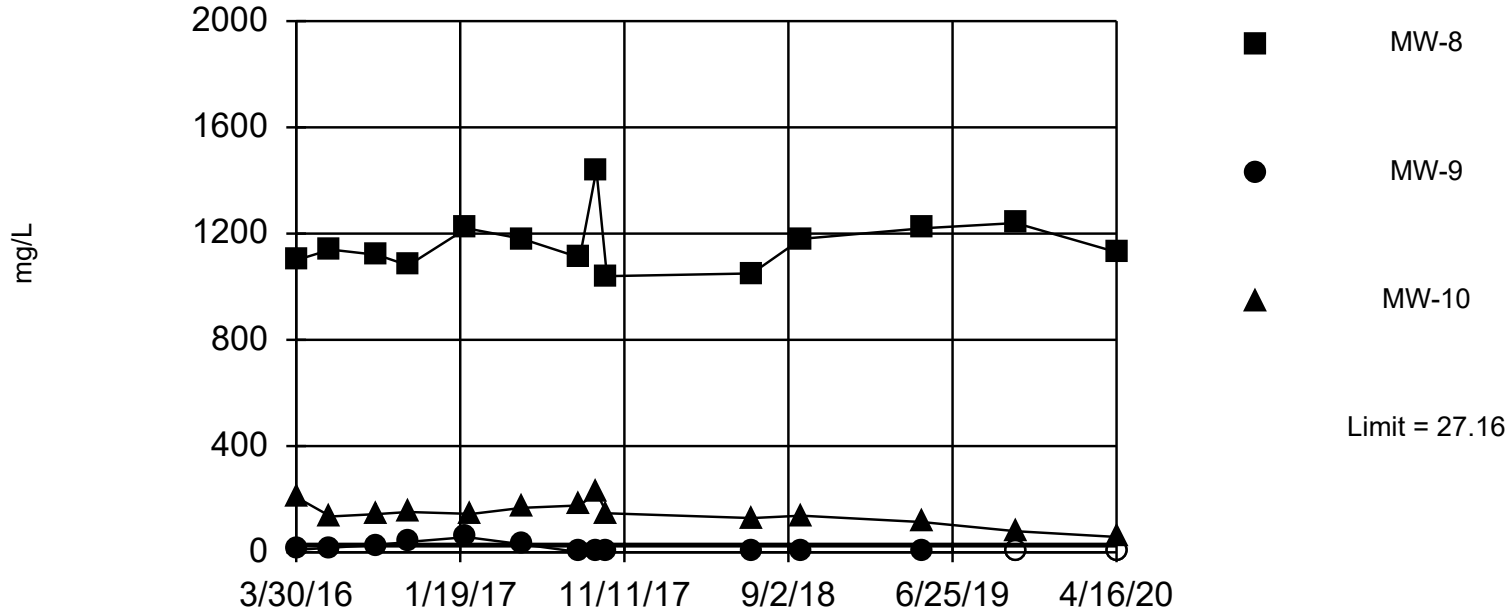
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=18.29, Std. Dev.=4.12, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Sulfate Analysis Run 11/24/2020 12:57 PM

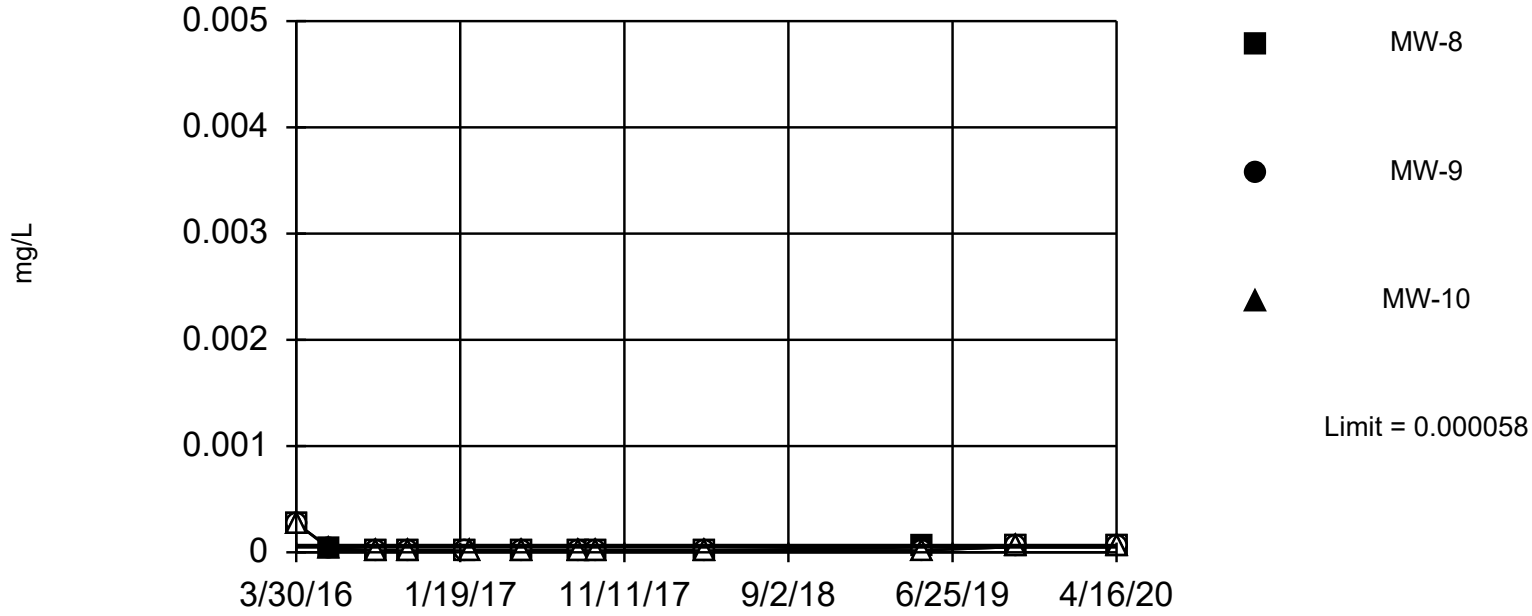
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 11 background values. 81.82% NDs. Report alpha = 0.2143. Individual comparison alpha = 0.07724. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <0.00055 (3/30/2016).

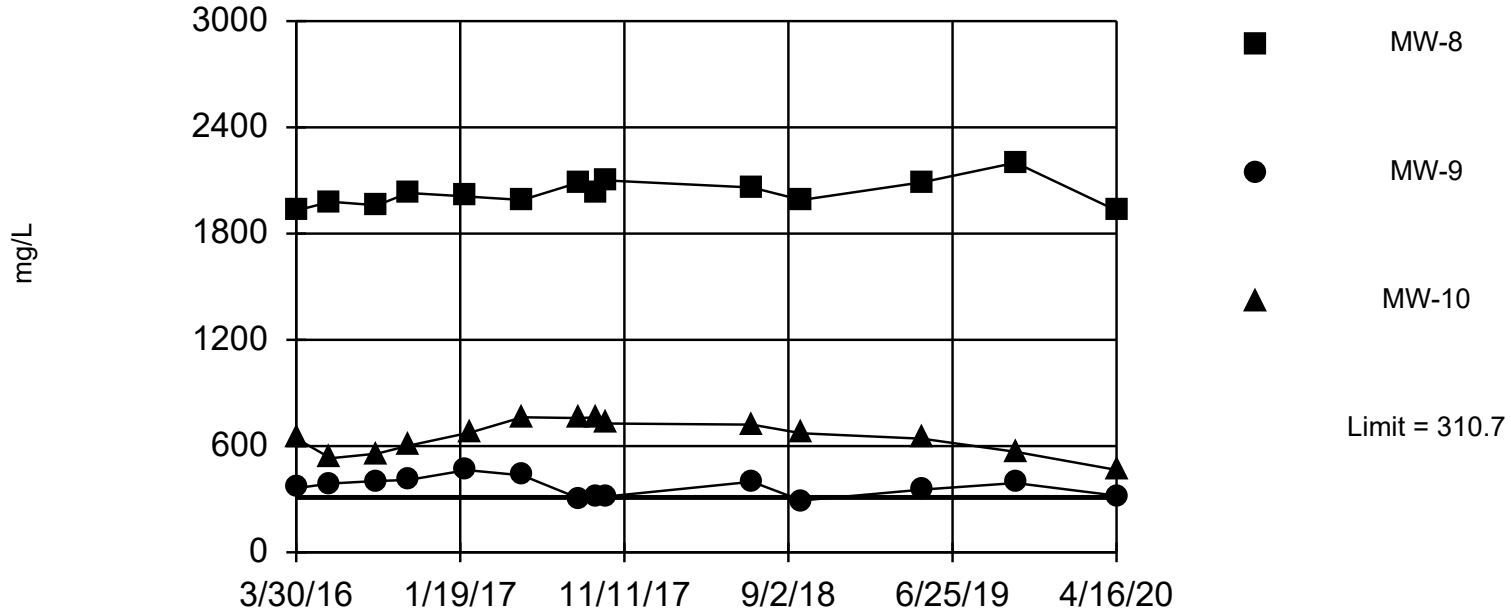
Constituent: Thallium Analysis Run 11/24/2020 12:58 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-9, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=261.9, Std. Dev.=22.4, n=13. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: 148 (4/16/2020).

Constituent: Total Dissolved Solids Analysis Run 11/24/2020 1:02 PM

Facility: BREC Reid SI Data File: Reid SI All Data

Attachment 2

September 2020 Time Series Plots

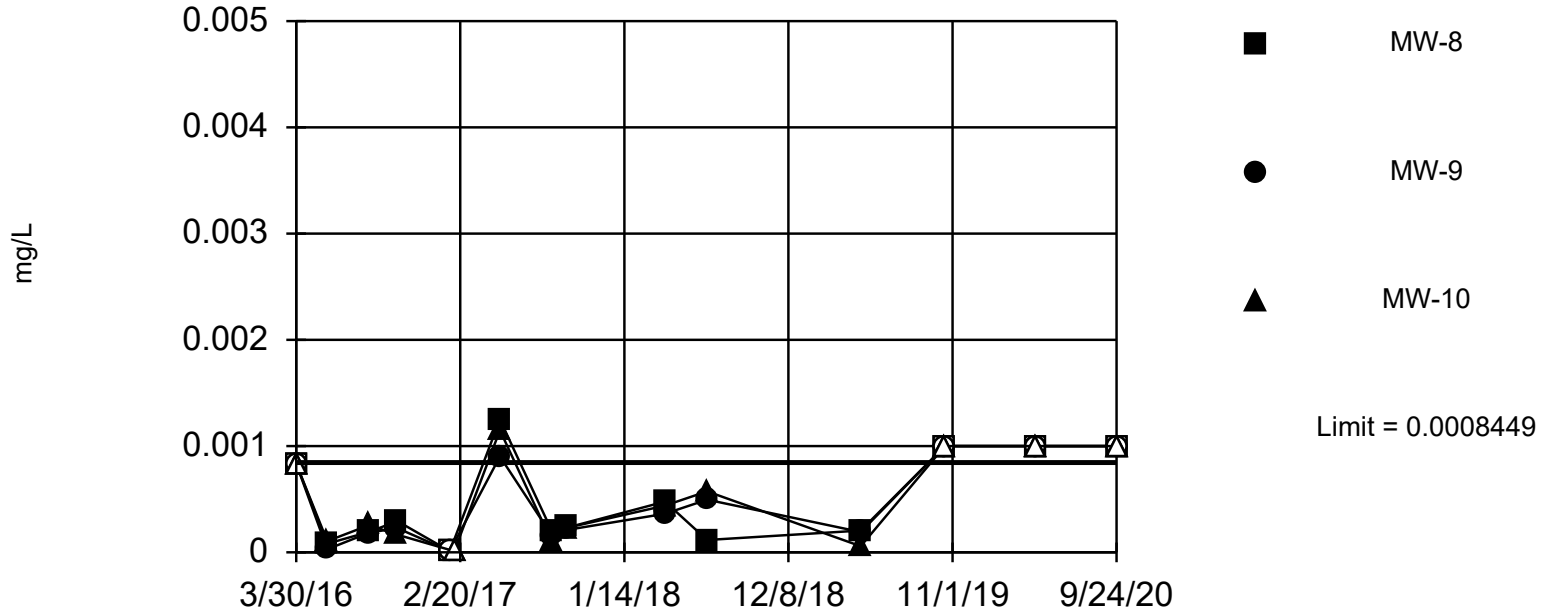
And Prediction Limit Results

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (after Aitchison`s Adjustment): Mean=0.0002398, Std. Dev.=0.000281, n=14, 42.86% NDs. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Antimony Analysis Run 11/24/2020 8:36 AM

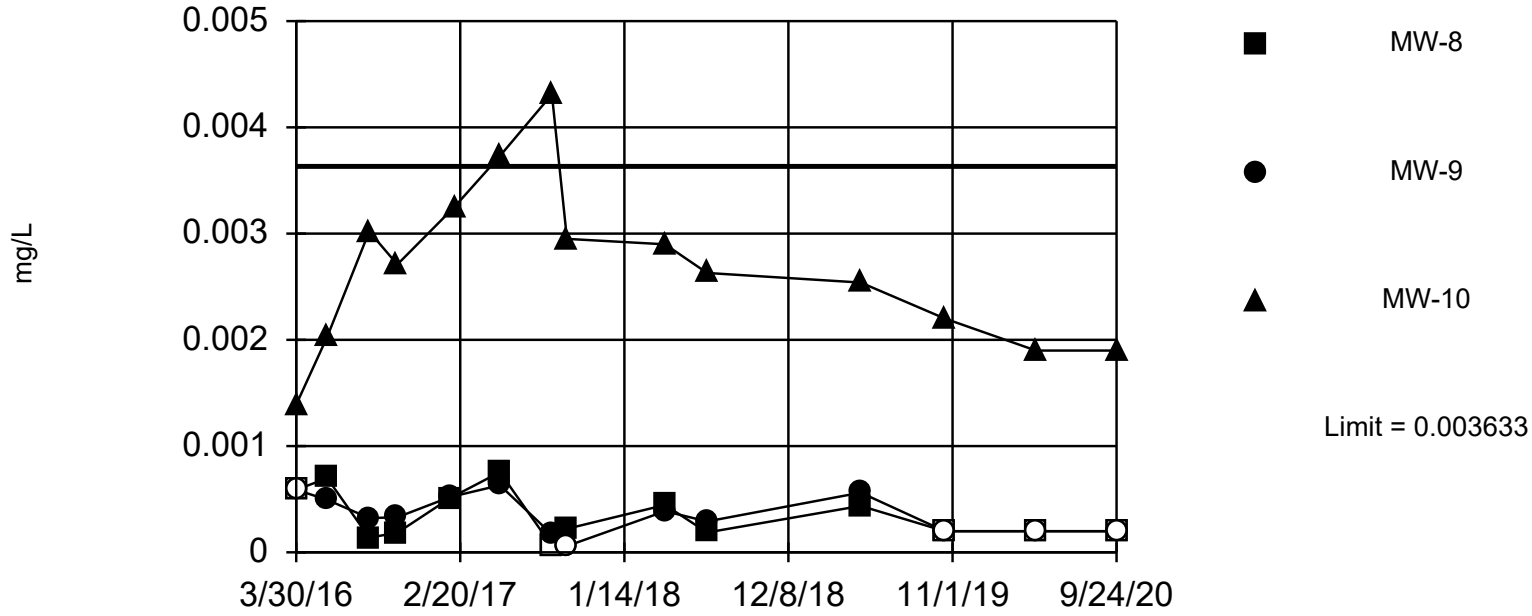
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=-6.703, Std. Dev.=0.5038, n=14, 7.143% NDs. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

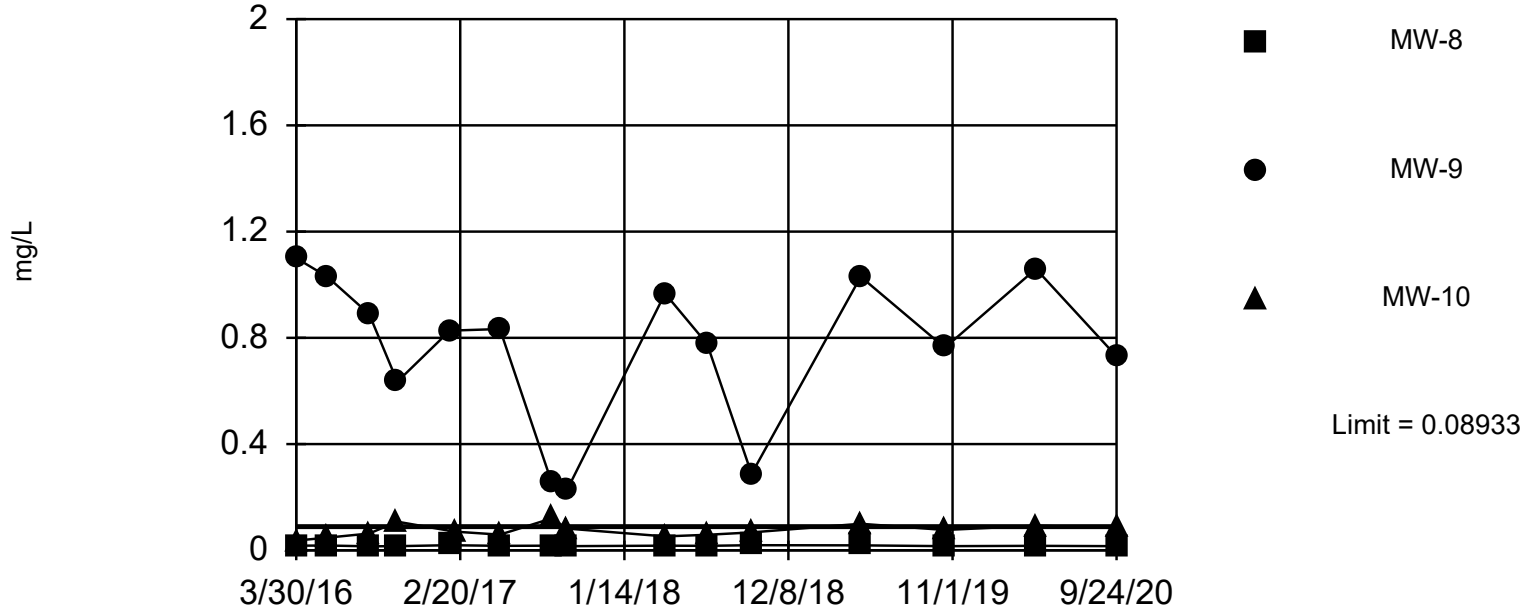
Constituent: Arsenic Analysis Run 11/24/2020 8:44 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-9

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.06675, Std. Dev.=0.01058, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Barium Analysis Run 11/24/2020 8:51 AM

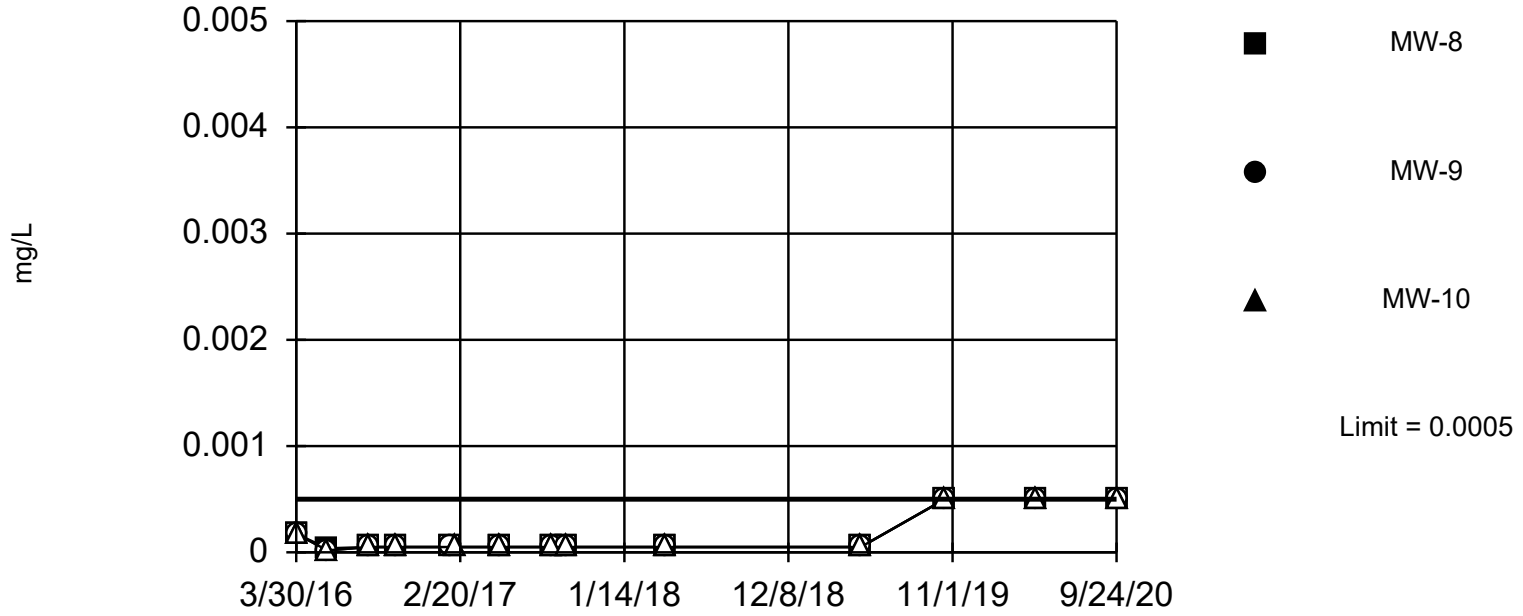
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 100% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Beryllium Analysis Run 11/24/2020 8:53 AM

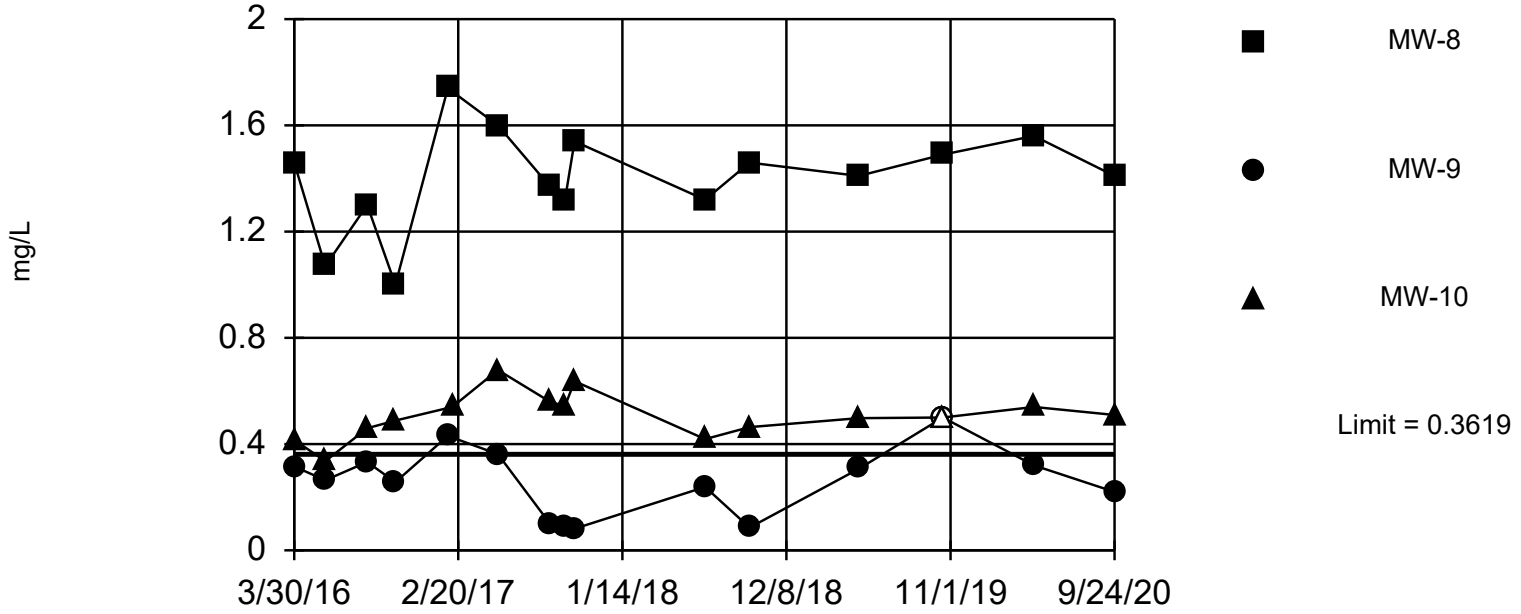
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2884, Std. Dev.=0.03412, n=14. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. One background outlier was removed: <1 (10/16/2019).

Constituent: Boron Analysis Run 11/24/2020 10:35 AM

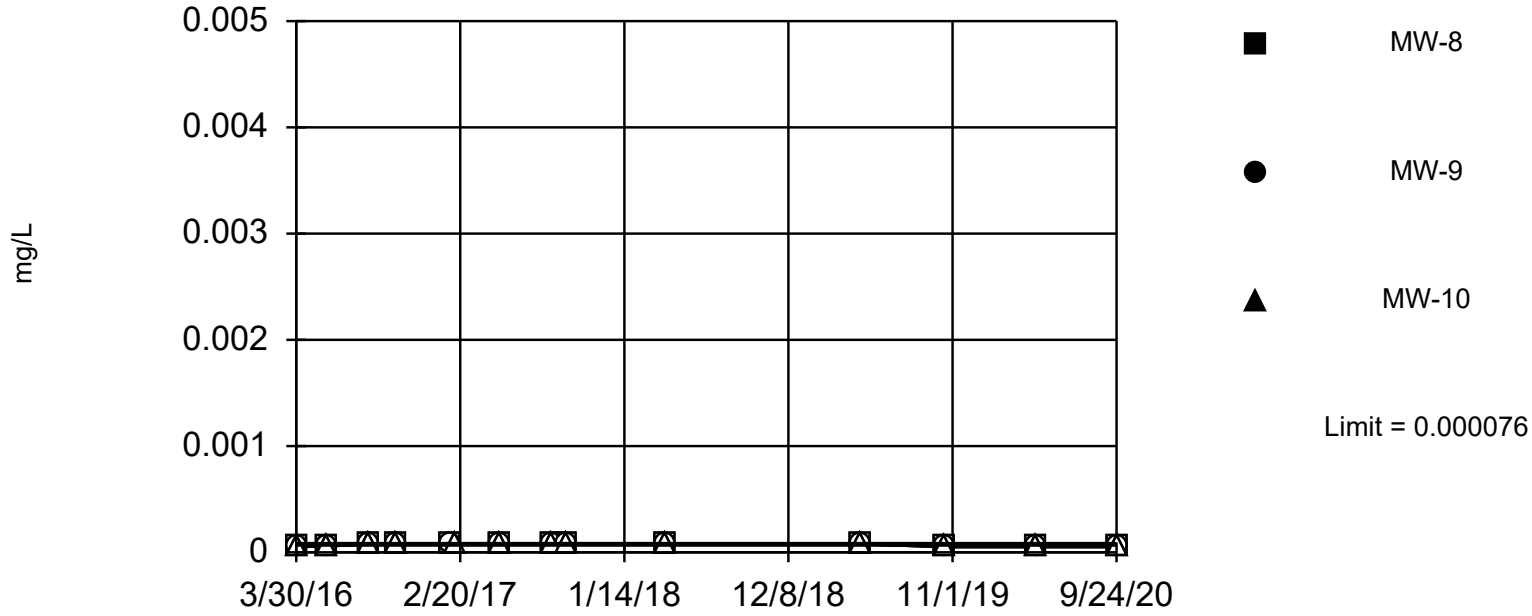
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 13 background values. 100% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

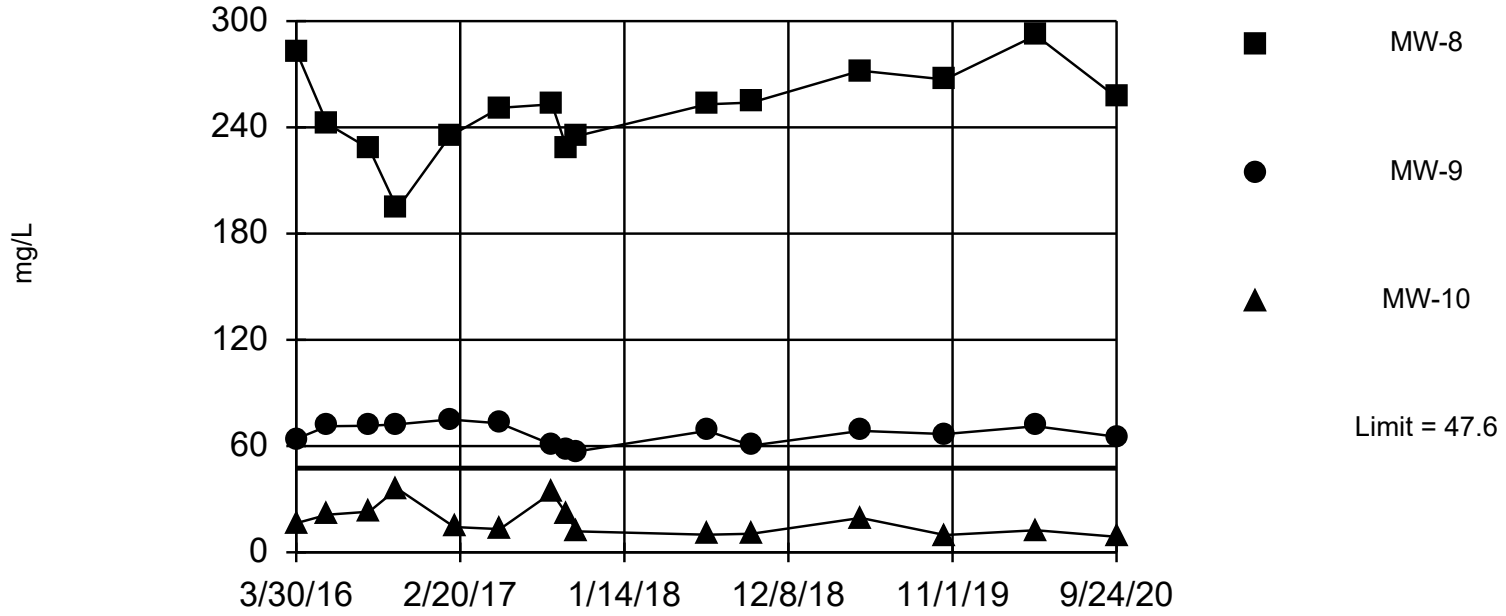
Constituent: Cadmium Analysis Run 11/24/2020 9:07 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-9

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 15 background values. Report alpha = 0.1667. Individual comparison alpha = 0.05896. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

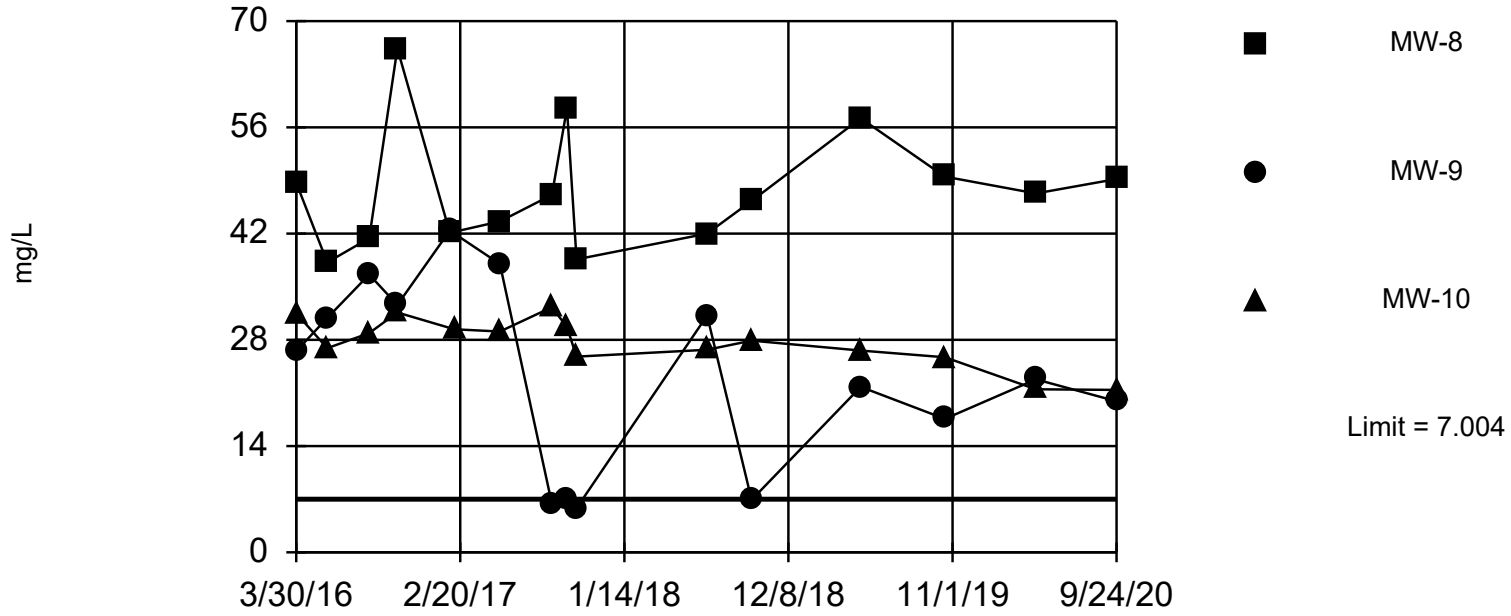
Constituent: Calcium Analysis Run 11/24/2020 9:12 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-9, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=4.277, Std. Dev.=1.277, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Chloride Analysis Run 11/24/2020 9:17 AM

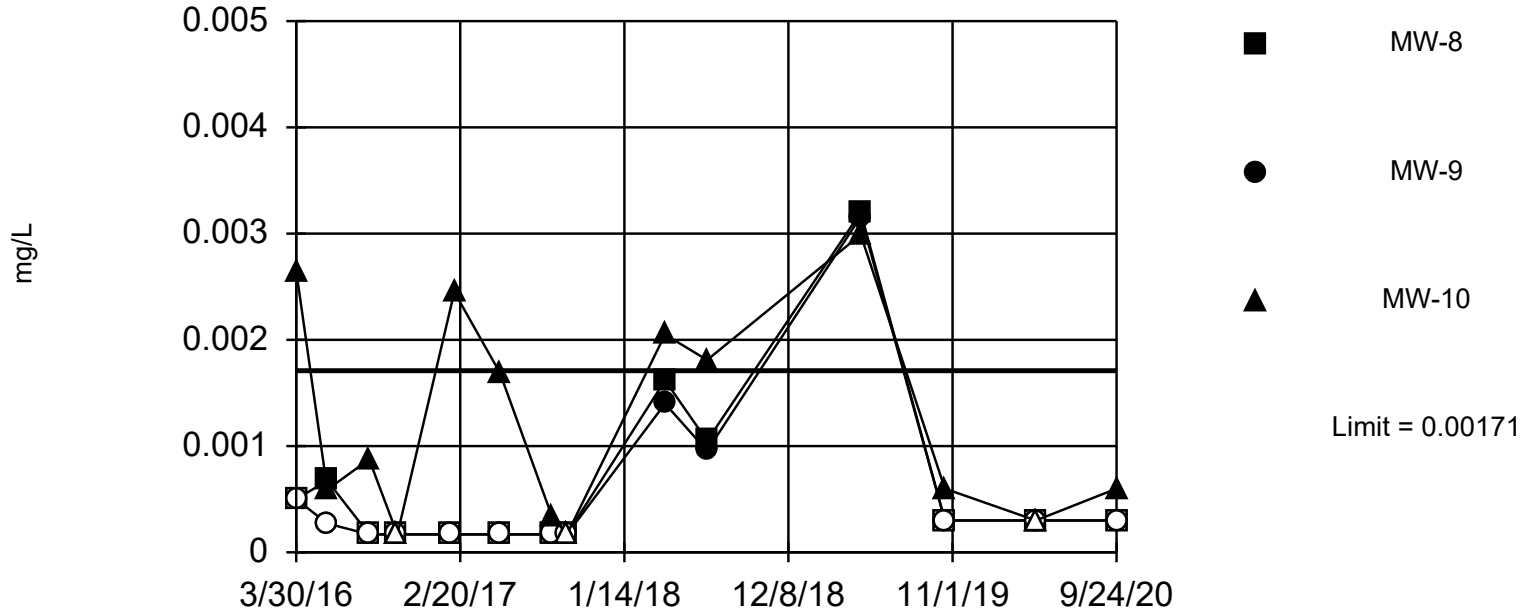
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 14 background values. 78.57% NDs. Report alpha = 0.1765. Individual comparison alpha = 0.06267. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Chromium Analysis Run 11/24/2020 9:25 AM

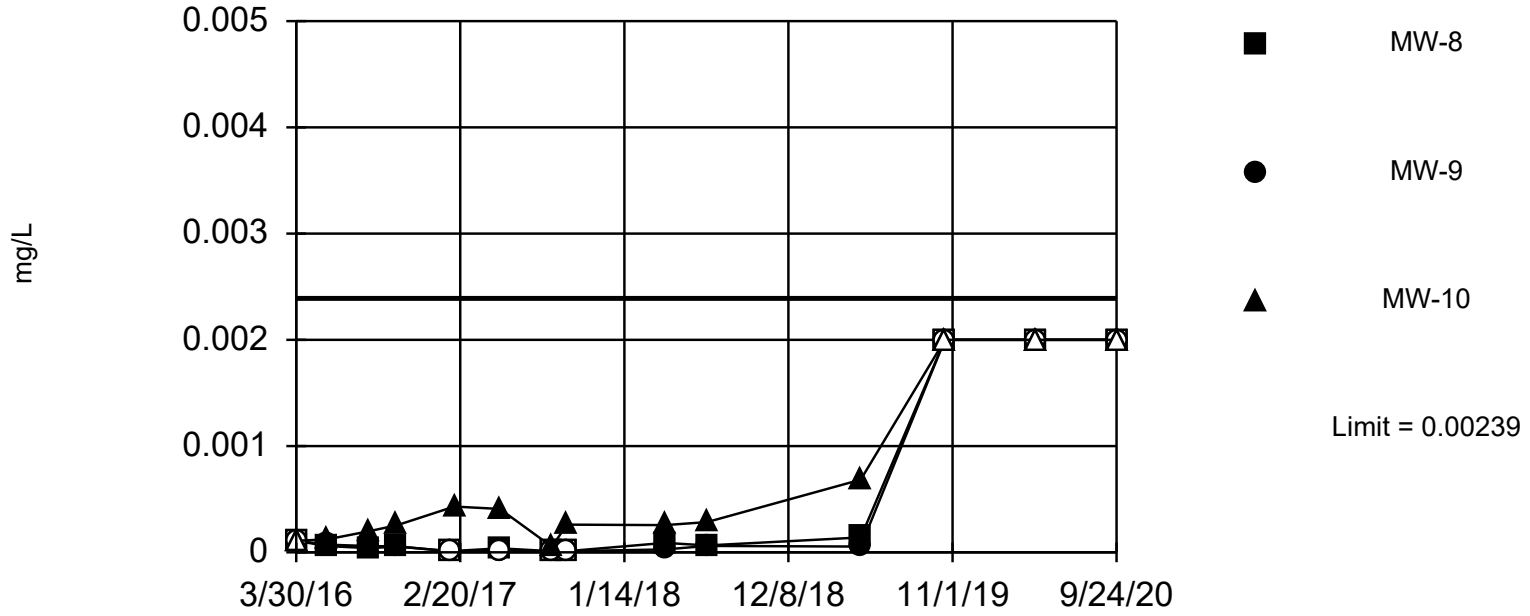
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used after natural log transformation resulted in a parametric limit of 3.205, which exceeds 10 times the highest background value (user-adjustable cutoff). Limit is highest of 14 background values. 21.43% NDs. Report alpha = 0.1765. Individual comparison alpha = 0.06267. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

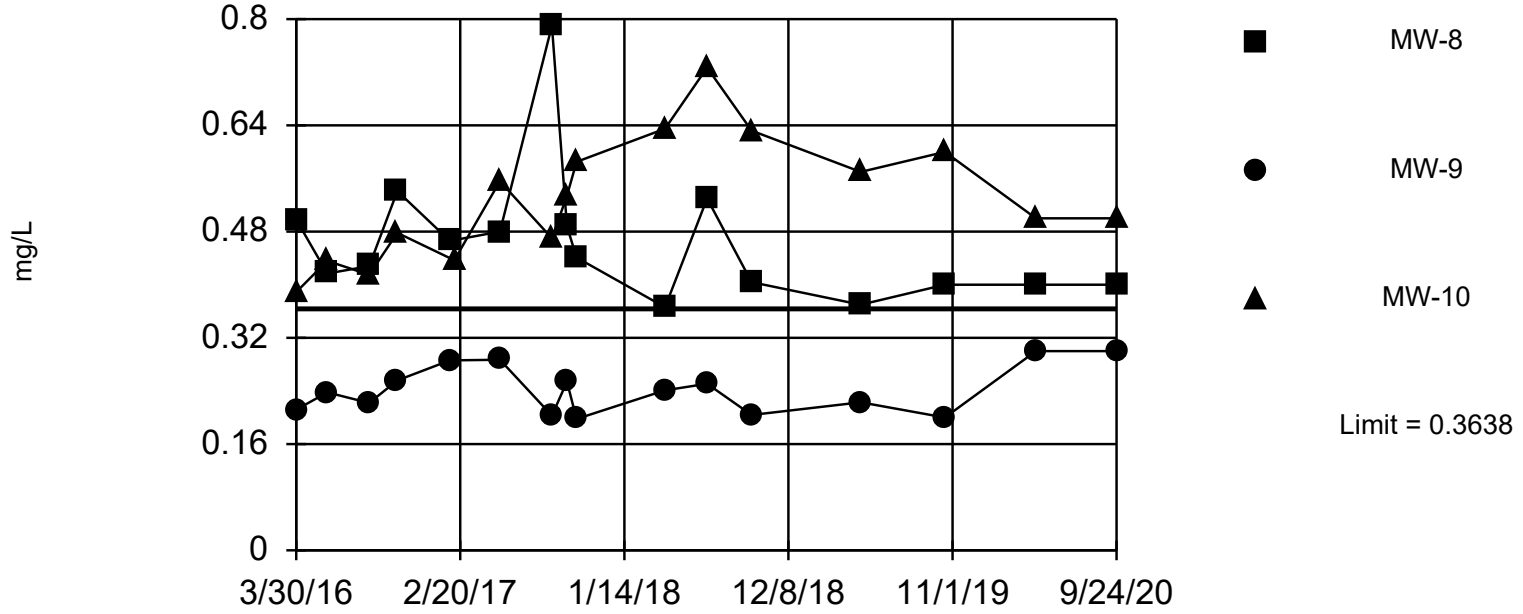
Constituent: Cobalt Analysis Run 11/24/2020 9:27 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.2818, Std. Dev.=0.03871, n=16. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Fluoride Analysis Run 11/24/2020 9:31 AM

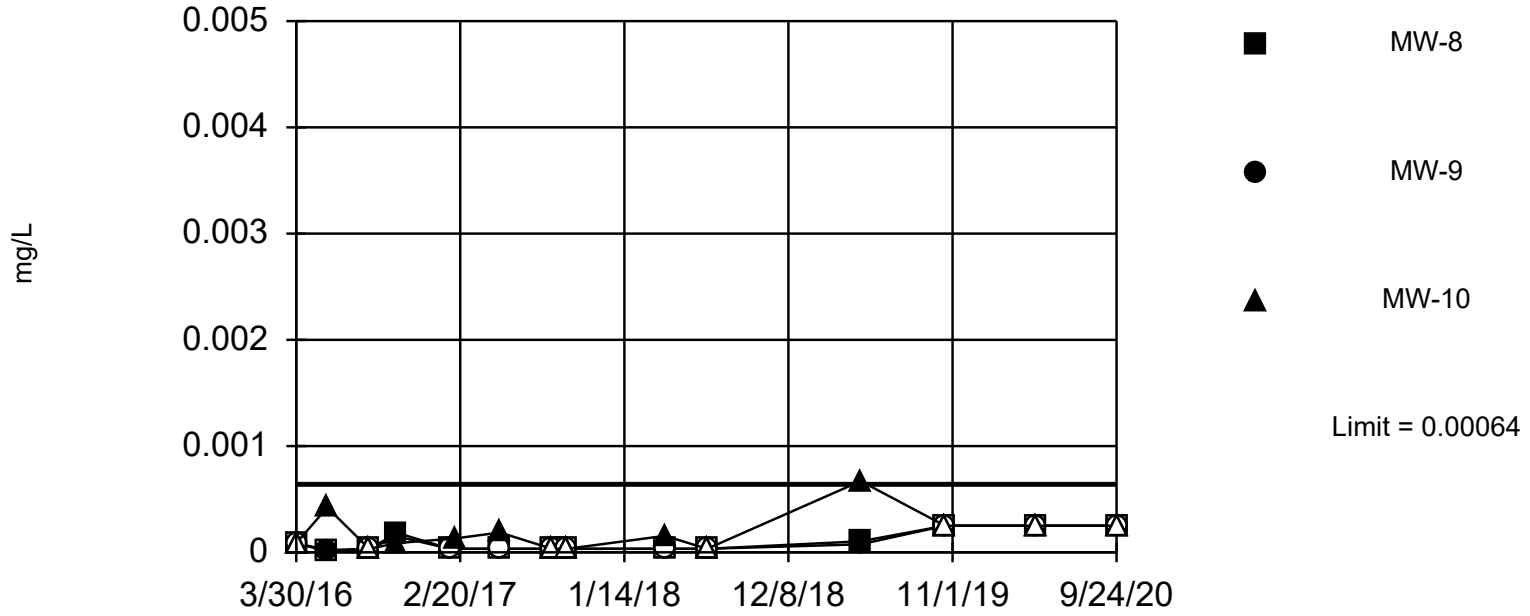
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 14 background values. 71.43% NDs. Report alpha = 0.1765. Individual comparison alpha = 0.06267. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lead Analysis Run 11/24/2020 9:36 AM

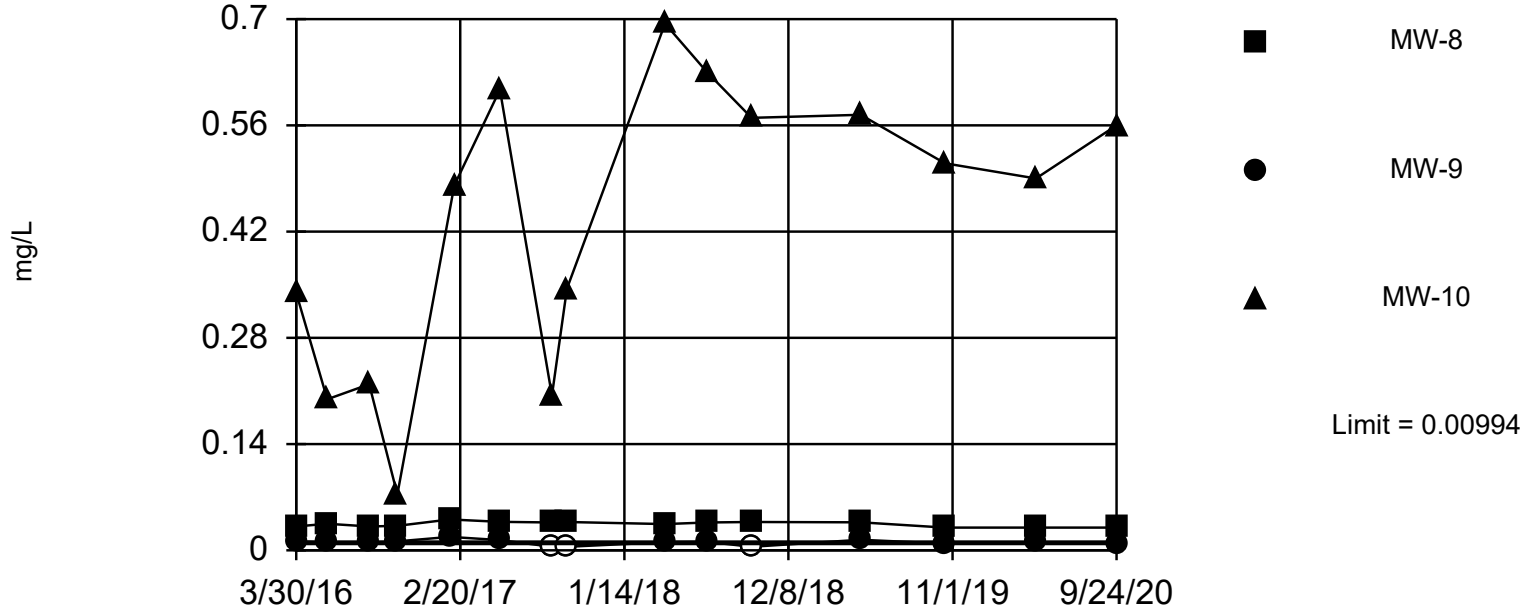
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 15 background values. 66.67% NDs. Report alpha = 0.1667. Individual comparison alpha = 0.05896. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Lithium Analysis Run 11/24/2020 9:43 AM

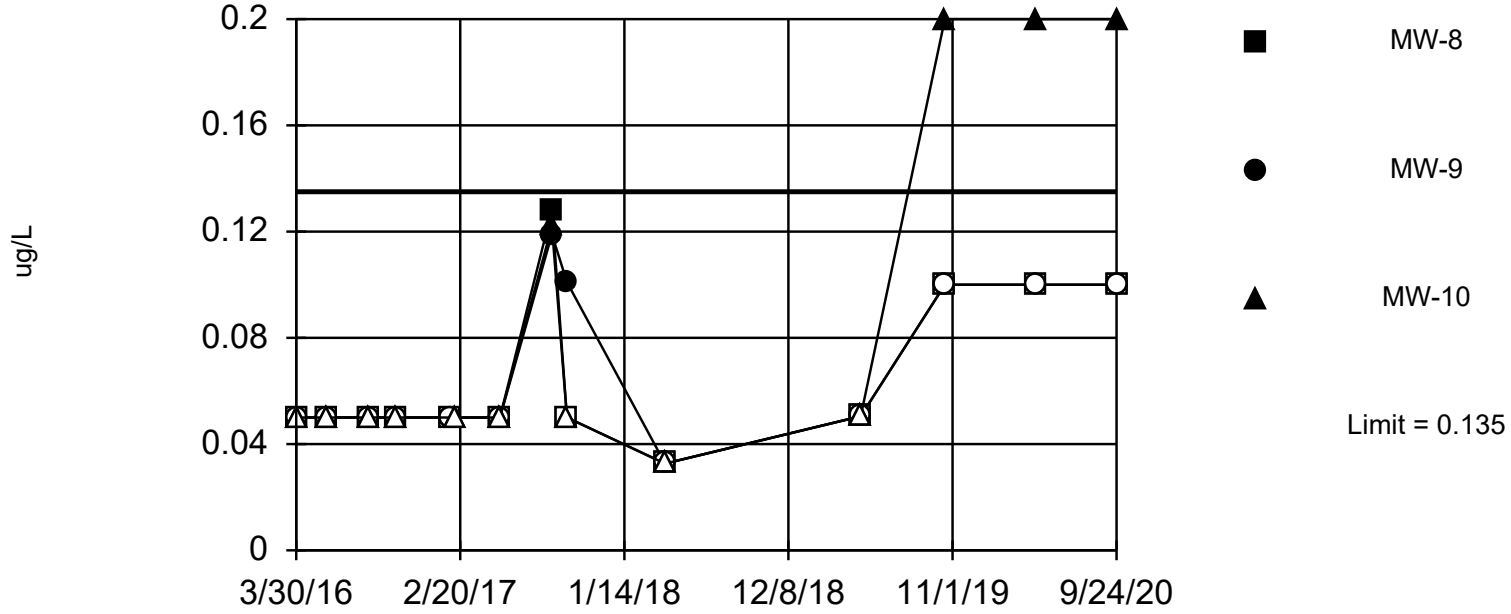
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-10

Prediction Limit

Interwell Non-parametric



NP test selected by user. Limit is highest of 13 background values. 92.31% NDs. Report alpha = 0.1875. Individual comparison alpha = 0.06687. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Mercury Analysis Run 11/24/2020 9:47 AM

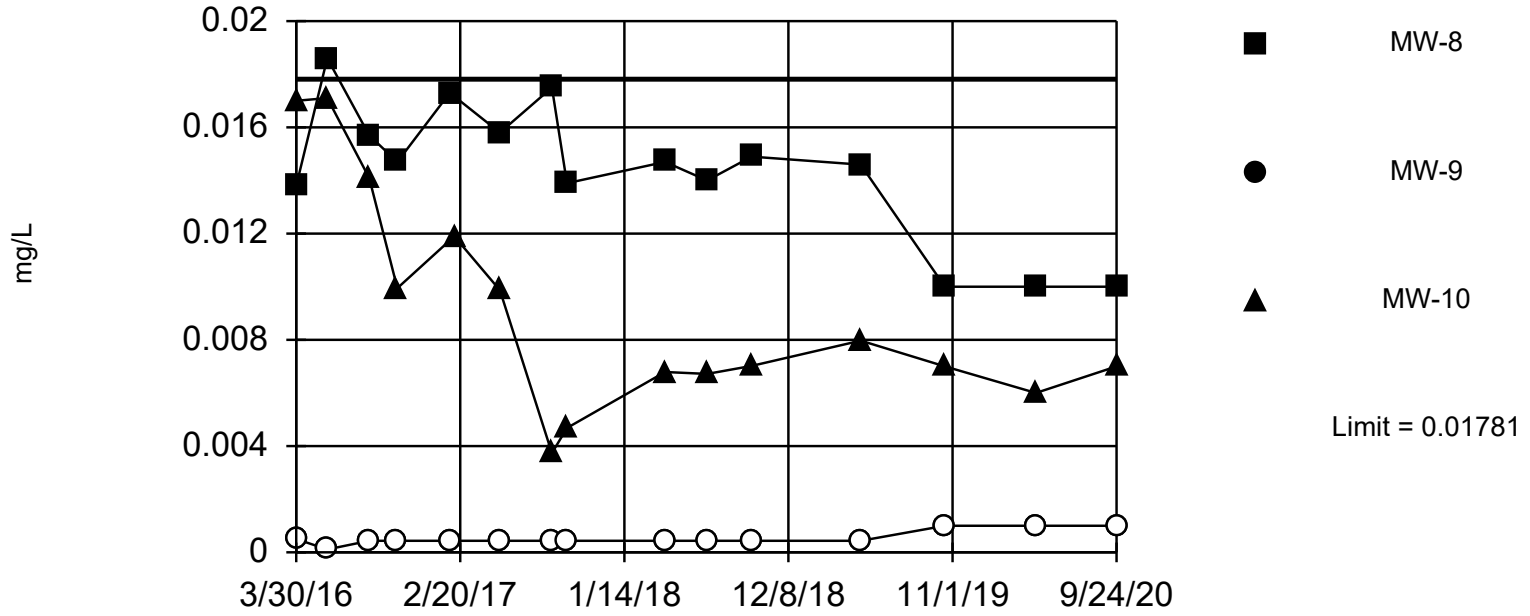
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.008924, Std. Dev.=0.004165, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

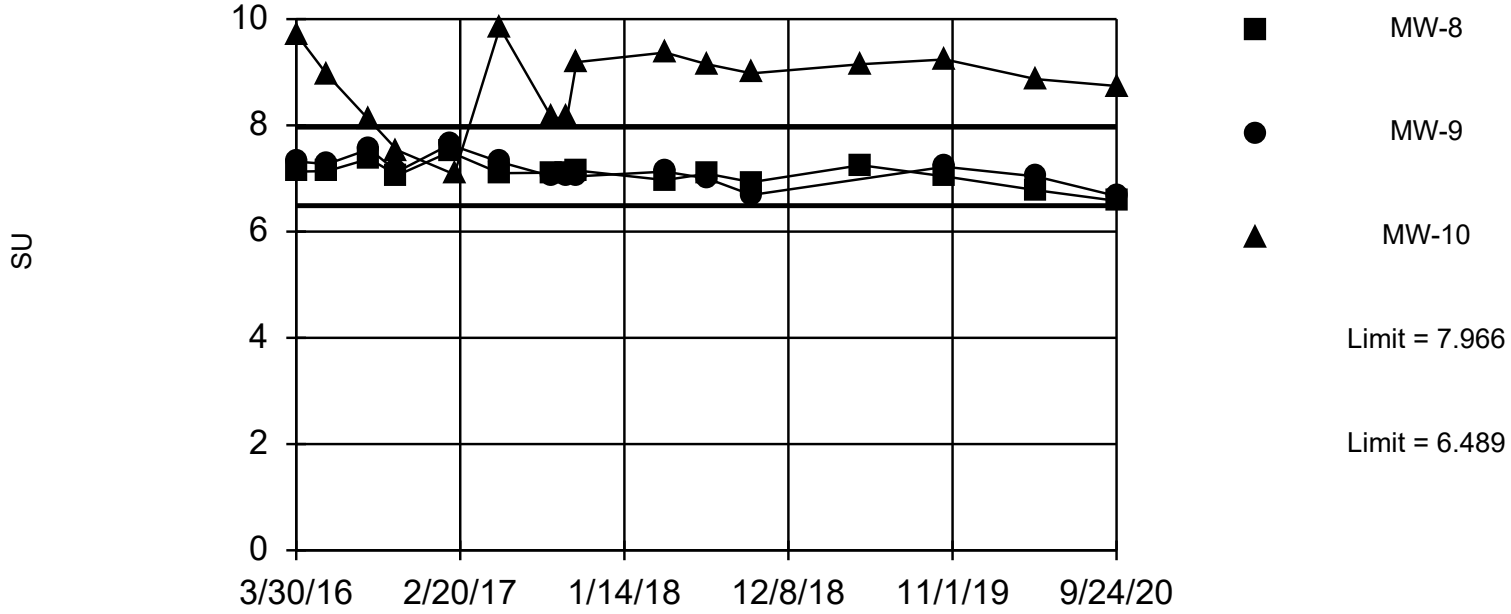
Constituent: Molybdenum Analysis Run 11/24/2020 9:52 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limits: MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=7.228, Std. Dev.=0.2967, n=16. Report alpha = 0.08425. Individual comparison alpha = 0.01446. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: pH [Field] Analysis Run 11/24/2020 9:54 AM

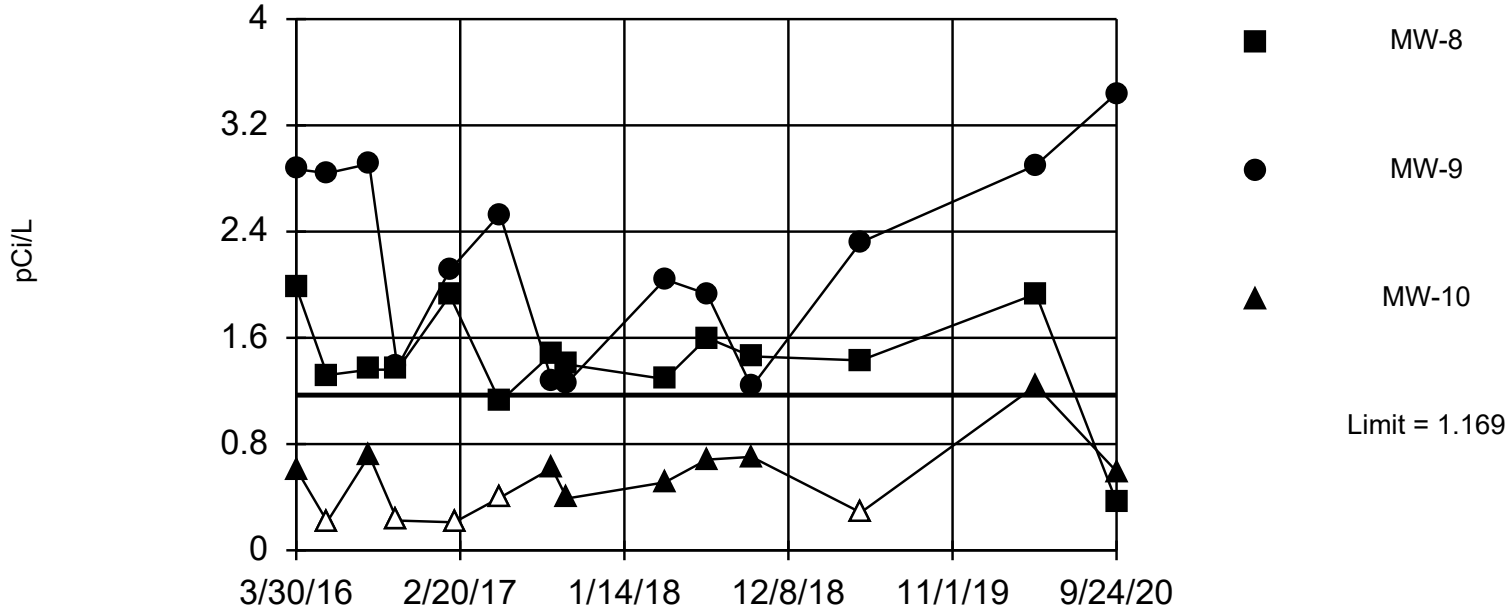
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-9

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=0.7699, Std. Dev.=0.1811, n=12. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: <0.506 (10/18/2016); 1.83 (4/16/2020).

Constituent: Radium 226 + 228 Analysis Run 11/24/2020 10:03 AM

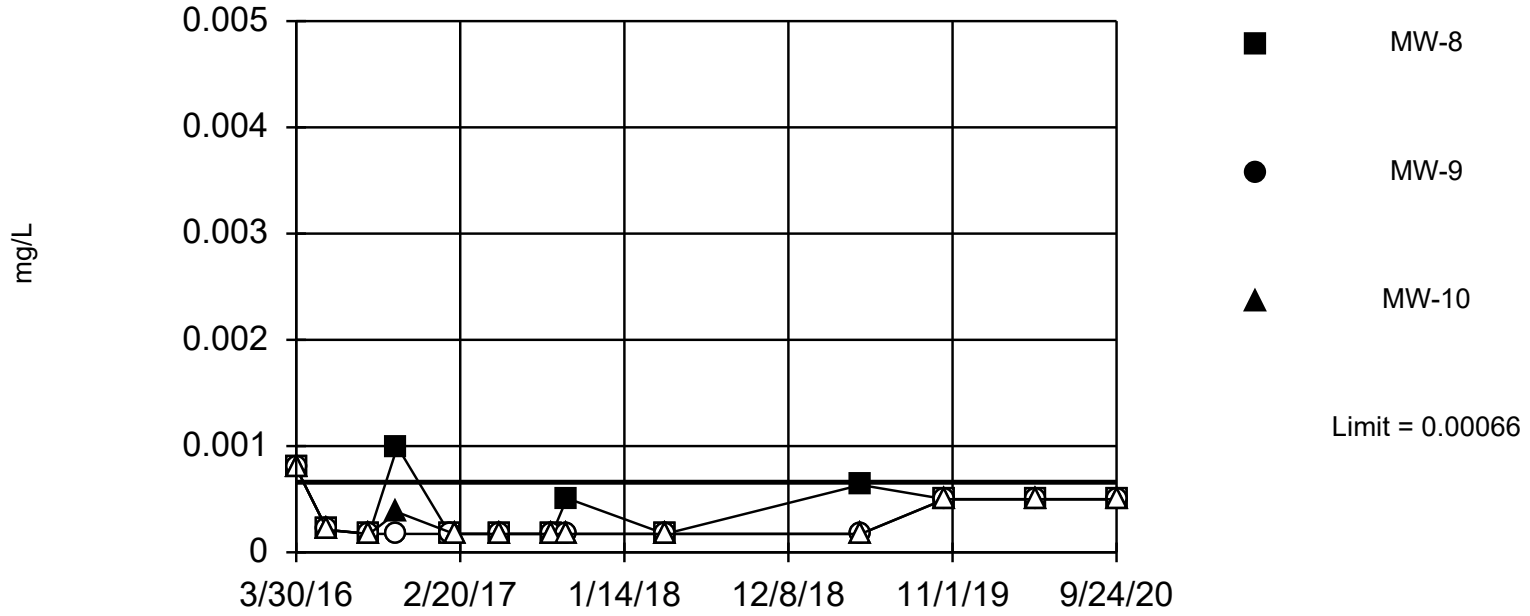
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 91.67% NDs. Report alpha = 0.2. Individual comparison alpha = 0.07168. Most recent point for each compliance well compared to limit. After outlier removal all values were the same, so outlier results were invalidated.

Constituent: Selenium Analysis Run 11/24/2020 10:11 AM

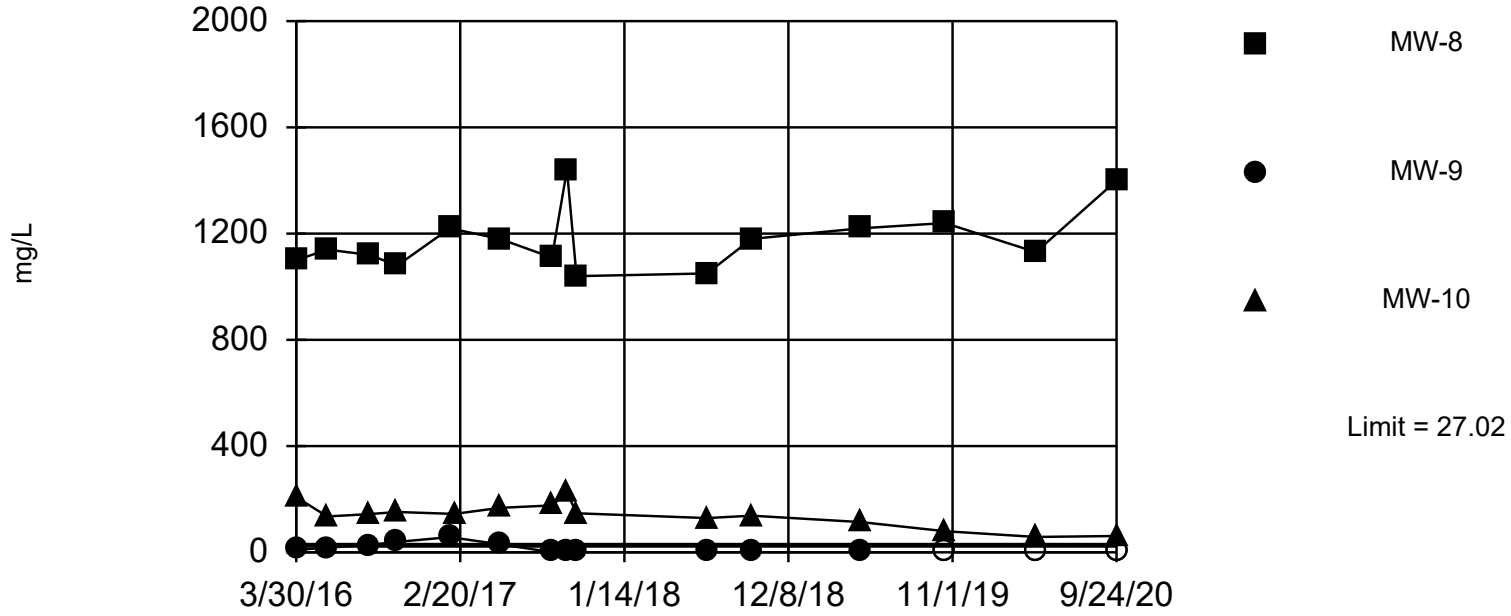
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=17.87, Std. Dev.=4.289, n=15. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. No background outliers were found.

Constituent: Sulfate Analysis Run 11/24/2020 10:15 AM

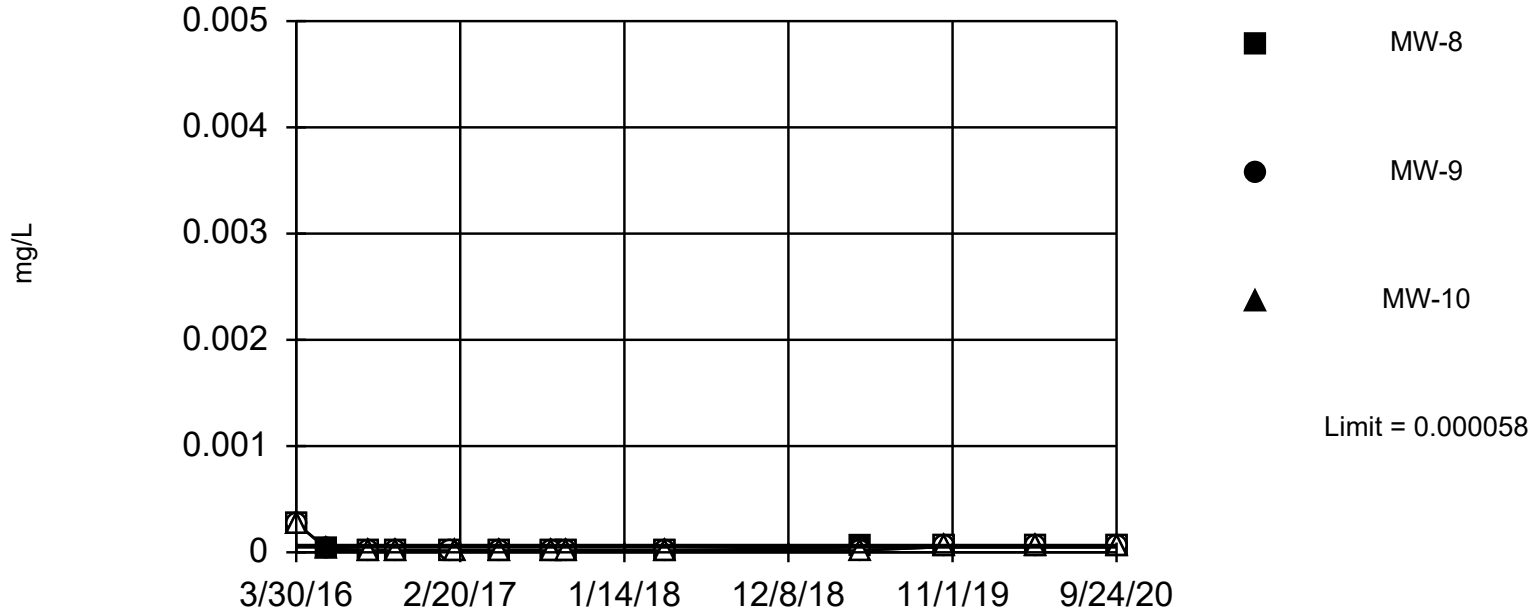
Facility: BREC Reid SI Data File: Reid SI All Data

WQStat Plus™ v.9.4.32
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 12 background values. 83.33% NDs. Report alpha = 0.2. Individual comparison alpha = 0.07168. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. After outlier removal distribution was non-normal; user chose to continue. One background outlier was removed: <0.00055 (3/30/2016).

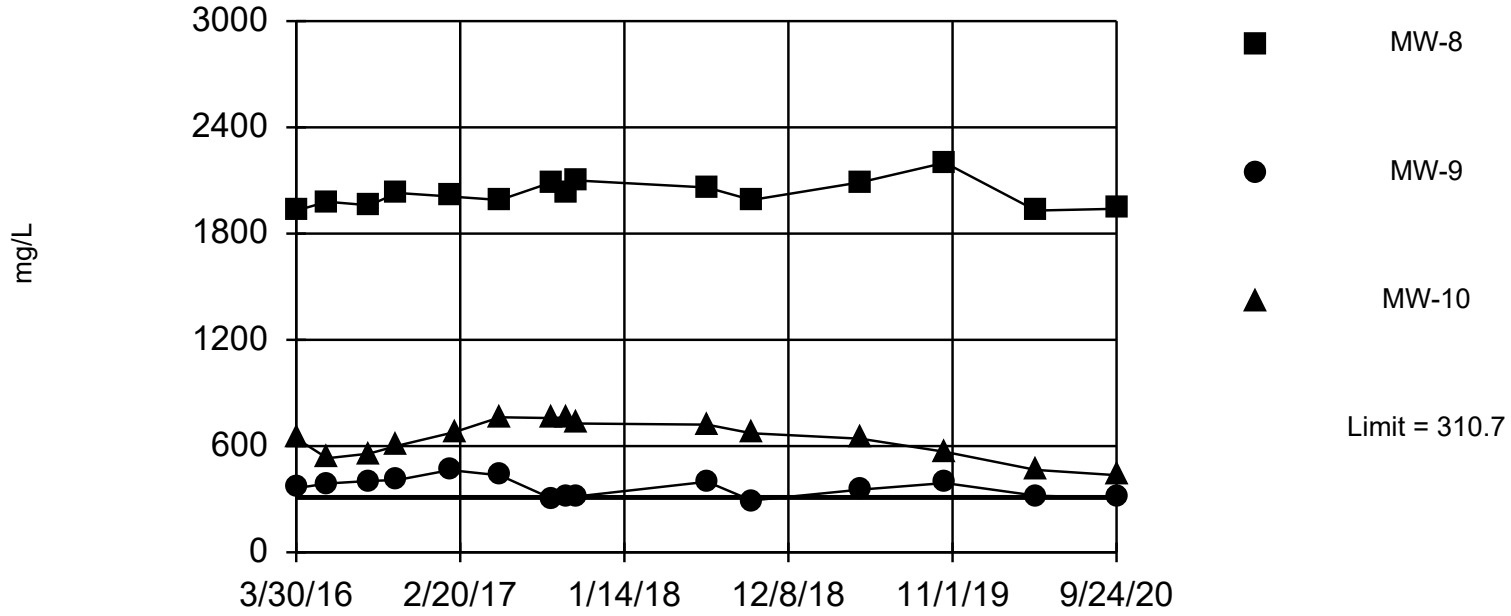
Constituent: Thallium Analysis Run 11/24/2020 10:18 AM

Facility: BREC Reid SI Data File: Reid SI All Data

Exceeds Limit: MW-8, MW-10

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=261.9, Std. Dev.=22.4, n=13. Report alpha = 0.08425. Individual comparison alpha = 0.02891. Most recent point for each compliance well compared to limit. The EPA 1989 Outlier Test was performed on the background data. Two background outliers were removed: 148 (4/16/2020); 114 (9/24/2020).

Constituent: Total Dissolved Solids Analysis Run 11/24/2020 10:45 AM

Facility: BREC Reid SI Data File: Reid SI All Data

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