

**2019**

**ANNUAL GROUNDWATER MONITORING AND  
CORRECTIVE ACTION REPORT**

**COAL COMBUSTION RESIDUALS (CCR) RULE**

**D.B. WILSON GENERATING STATION  
PHASE II CCR LANDFILL  
OHIO COUNTY, KENTUCKY**

*Prepared for:*



**Big Rivers Electric Corporation  
D.B. Wilson Generating Station  
5663 State Route 85 West  
Centertown, Kentucky 42328**

*Prepared by:*

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January 2020

## CONTENTS

Section		Page
1.0	INTRODUCTION.....	1
1.1	Site Description .....	1
1.2	Program Monitoring Well Systems.....	1
1.2.1	Operating Permit Monitoring Wells .....	1
1.2.1	Characterization Monitoring Wells .....	2
2.0	2019 ACTIVITIES SUMMARY .....	3
2.1	Groundwater Sampling .....	3
2.2	Assessment of Corrective Measures .....	3
3.0	DATA EVALUATION.....	5
3.1	Groundwater Flow.....	5
3.2	Sampling Results .....	5
3.3	Statistical Evaluation .....	5
3.4	Conclusions.....	6
4.0	2020 Planned Activities.....	7
4.1	Groundwater Monitoring .....	7
4.2	Remedy Selection .....	7
5.0	REFERENCES.....	8

### List of Tables

Table 1	Monitoring Well System Summary of Monitoring Well Construction
Table 2	Monitoring Well Network Groundwater Elevations

### List of Figures

Figure 1	General Location Map
Figure 2	CCR Groundwater Monitoring System
Figure 3	Groundwater Surface Map, November 2019

### List of Appendices

Appendix A	2009 Monitoring Well Completion Report
Appendix B	2019 Monitoring Well Construction Progress Report
Appendix C	Analytical Summary Tables
Appendix D	Analytical Laboratory Reports
Appendix E	Statistical Evaluation

## 1.0 INTRODUCTION

At the request of Big Rivers Electric Corporation (BREC), AECOM Technical Services, Inc. (AECOM) prepared this 2019 Annual Groundwater Monitoring and Corrective Action Report for the BREC D.B. Wilson Coal Combustion Residuals (CCR) Phase II Landfill (the Unit), located in Ohio County, Kentucky. This report was prepared in accordance with Part 257.90, Sub-Part (e) of the United States Environmental Protection Agency (USEPA) CCR Rule. The CCR Rule was established to regulate the disposal of CCR produced by electricity generating facilities (USEPA, 2015).

This report summarizes all activities related to the CCR Rule groundwater monitoring program at the Unit in 2019. 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 2016-2018 Annual Groundwater Monitoring and Corrective Action Report, statistical results of the baseline groundwater data indicate that the Unit requires Assessment Monitoring under the CCR Rule, as most of the Appendix III constituents, excluding fluoride and pH, have statistically significant increases (SSIs) over background. On February 5, 2018, BREC posted a formal notification that the Unit would enter into an Assessment Monitoring Program, fulfilling the requirement of 40 Code of Federal Regulations (CFR) § 257.107(h)(4).

### 1.1 Site Description

The Wilson Phase II Landfill is located in Ohio County approximately 5 miles northwest of the town of Centertown, Kentucky (**Figure 1**). The property is located northwest and adjacent to the D.B. Wilson Generating Station (Wilson Station). The current Wilson Phase II Landfill footprint is approximately 92 acres (**Figure 2**). Adjacent to the Phase II Landfill on the east is the Wilson Station Phase I Landfill, which is currently being regulated by Special Waste permit by the Kentucky Department of Environmental Protection, Division of Waste Management (KDMW) under of Title 401 of the Kentucky Administrative Regulations (KAR) Section 45.

The Wilson Phase II Landfill is raised above adjacent ground to a maximum elevation of approximately 520 feet above mean sea level (amsl). The original ground surface within the landfill footprint was an irregular post-mining reclaimed surface.

### 1.2 Program Monitoring Well Systems

#### 1.2.1 Operating Permit Monitoring Wells

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

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

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

Details about the monitoring network are presented in the *Monitoring Well Completion Report, D.B. Wilson Special Waste Landfill, Solid Waste Permit Number 092-00004, Ohio Count, Kentucky* (Associated Engineers, Inc., April 13, 2009), a copy of which was included as **Appendix A. No changes were made to the Program Monitoring Well System in 2019.** Monitoring wells MW-1, MW-2, MW-3, MW-4, P-9, and P-11 are included in the CCR program as “water level only” monitoring points

### 1.2.1 Characterization Monitoring Wells

To address the requirements of 40 CFR § 257.95(g)(1), five (5) Characterization monitoring wells (MW-102, MW-104, MW-105, MW-110, and MW-4D) were installed in October 2018 for the characterization of groundwater at locations indicated on **Figure 2**. As-built specifics of each well installation are summarized on **Table 1**. A Monitoring Well Construction Progress Report (AECOM, December 13, 2019), included herein as **Appendix B**, was prepared to summarize the well installation process and testing results.

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

## 2.0 2019 ACTIVITIES SUMMARY

The following subsections describe the activities that were performed in 2019 for the Wilson Phase II Landfill related to the CCR Groundwater Monitoring Network.

### 2.1 Groundwater Sampling

Four groundwater sampling events were conducted at Wilson Phase II Landfill in 2019, including two Assessment Monitoring events and two Characterization sampling events. The following table summarizes the dates of the sampling event and the wells included in the event.

Event Type	Sampling Event	Dates	Wells Sampled
Assessment	13	June 27-30, 2019	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7. MW-10
Characterization	2	June 27-28, 2019	Characterization Wells MW-4D, MW-102, MW-104, MW-105, MW110
Assessment	14	November 4-7, 2019	Background (Upgradient) MW-8 Downgradient MW-5, MW-6, MW-7. MW-10
Characterization	3	November 7-8, 2019	Characterization Wells MW-4D, MW-102, MW-104, MW-105, MW110

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

Groundwater sampling activities were performed by BREC personnel in June and November 2019. Groundwater samples collected during the June 2019 event were submitted to Test America, Inc. (Test America) in Nashville, Tennessee and McCoy and McCoy Laboratories, Inc. in Madisonville, Kentucky for analyses. Groundwater samples collected during the November 2019 event were solely submitted to and McCoy and McCoy Laboratories, Inc. for analyses. Groundwater samples collected during the June and November Assessment Monitoring events were analyzed for Appendix III and Appendix IV parameters, in accordance with 40 CFR § 257.95(b). Groundwater samples collected during the June and November Characterization monitoring events were analyzed for Appendix III and Appendix IV parameters in accordance with 40 CFR § 257.95(g)(1).

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 Assessment of Corrective Measures

On December 6, 2018, BREC posted a formal notification that the Wilson Phase II Landfill would initiate an Assessment of Corrective Measures (ACM) per 40 CFR § 257.95(g)(5), fulfilling the requirement of 40 CFR

§ 257.107(h)(7). A notice of ACM initiation dated January 14, 2019 was posted to BREC's publicly-accessible CCR reporting website.

In June 2019 BREC finalized an ACM to identify applicable remedial technologies to address cobalt impacts in groundwater pursuant to Title 40 CFR Section 257.96. A report summarizing the results of the ACM (AECOM, June 2019) was posted to BREC's publicly-accessible CCR reporting website on June 14, 2019.

## 3.0 DATA EVALUATION

### 3.1 Groundwater Flow

Groundwater level data collected during the 2019 monitoring events are summarized on **Table 2**. The data collected during November 2019 were used to construct a piezometric surface map to illustrate groundwater flow conditions for the uppermost aquifer (see **Figure 3**). These data are representative of general conditions at the site and support the following analysis.

Overall groundwater flow beneath the footprint of the Wilson Phase II Landfill is to the south and southeast. Groundwater flow beneath the Landfill is influenced by extensive strip-mining and the physical extent of mine spoil deposits. These mine spoil deposits are laterally limited by the remaining bedrock high-walls left undisturbed along the north side of State Route 85 and beyond the western edge of the Wilson Phase II Landfill.

### 3.2 Sampling Results

During 2019 a total of two (2) Assessment Monitoring events and two (2) Characterization sampling events were completed. Results from these sampling events are summarized on the tables included in **Appendix C**. Complete analytical laboratory reports are included in **Appendix D**.

### 3.3 Statistical Evaluation

As part of previous Assessment Monitoring performed at the Unit, background and downgradient wells for the Phase II Landfill were sampled for Appendix IV constituents in April, July, and October 2018. In accordance with 40 CFR § 257.95, groundwater protection standards (GWPS) were established for detected Appendix IV constituents. The 2018 Assessment Monitoring results indicate the presence of cobalt at a Statistically Significant Level (SSL) above the GWPS in one monitoring well (MW-10) at the Unit, as detailed in **Appendix C**.

In accordance with 40 CFR § 257.93(f), 40 CFR § 257.93(h), and 40 CFR § 257.95(d)(2), AECOM conducted a statistical evaluation of the 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. A summary of the 2019 statistical evaluation conducted on the Appendix III and assessment Appendix IV parameters is provided as **Appendix E**.

Statistical methods were chosen in accordance with 40 CFR § 257.93(f) and the rationale behind why each method was selected is outlined in Statistical Methods Certification Document dated June 28, 2016. The Appendix III groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the Unit, monitoring well MW-8 is designated as the background well because it is located upgradient, whereas monitoring wells MW-5, MW-6, MW-7, and MW-10 are designated as compliance wells because they are located downgradient.

The statistical analysis results indicate that the following Appendix III constituents have SSIs over background (see **Appendix E; Table E3**):

- MW-5: calcium, chloride, sulfate, and total dissolved solids (TDS);
- MW-6: calcium, chloride, and TDS;
- MW-7: boron, chloride, and TDS; and
- MW-10: calcium, chloride, and TDS.

Fluoride and pH do 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 E; Table E4**):

- MW-5: cobalt and lithium;
- MW-6: cobalt and lithium;
- MW-7: cobalt and lithium; and
- MW-10: cobalt.

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 a SSL over the GWPS, its LCL must be greater than the GWPS. **Attachment E, Table E5** provides a summary of the LCLs and GWPS for cobalt and lithium at monitoring wells MW-5, MW-6, MW-7, and MW-10. The results indicate that lithium at monitoring well MW-6 and cobalt at monitoring well MW-10 (yellow highlights) are 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.

On December 6, 2018, BREC posted a formal notification that one or more constituent in Appendix IV has been detected at SSLs above the established GWPS as required by 40 CFR 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 Wilson Phase II Landfill, BREC will continue Assessment Monitoring in 2020.



## **4.0 2020 Planned Activities**

### **4.1 Groundwater Monitoring**

Continued Semi-Annual Assessment Monitoring of all operating permit monitoring wells for the Unit are planned for 2020.

### **4.2 Remedy Selection**

As required by 40 CFR Section 257.97, BREC is in the process of selecting a remedy for groundwater impacts at the Unit.

Currently BREC considers four (4) potential corrective action alternatives as viable options to address groundwater impacts at the Unit. To evaluate each alternative, additional data collection will likely be required. BREC is currently evaluating data collection needs in the following areas to assist with remedy selection:

- 1) Nature and Extent of impact – groundwater trends, influence of non-groundwater remedies, etc.
- 2) Physical Characteristics – available data on the physical characteristics of the landfill and the groundwater environment
- 3) Performance Modeling – data needed to develop digital models demonstrating the effectiveness of potential alternatives
- 4) Engineering – feasibility, cost estimates, etc.

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

In 2019, BREC constructed a series of collection trenches around the perimeter of the Unit to address non-groundwater releases. The 2020 groundwater monitoring program will assist in evaluating the success of the non-groundwater release remedies and provide relevant and important information to be considered in the final groundwater remedy selection.

## **5.0 REFERENCES**

AECOM, June 2019. Assessment of Corrective Measures Under the CCR Rule, Phase II Landfill; D.B. Wilson Generating Station, Ohio County, Kentucky.

United States Environmental Protection Agency, 2015. Part 257.90, Sub-Part (e) Coal Combustion Residuals Rule.

## Tables

**TABLE 1**  
**MONITORING WELL SYSTEM SUMMARY OF MONITORING WELL CONSTRUCTION**  
**WILSON PHASE II LANDFILL**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

Well No.		Location*		Reference Elevation*		Casing Length (feet, TOIC)	Size / Type (ID / Material)	Filter Pack Interval (feet, NAD27)		Screened Interval (feet, NAD27)		Bottom of Boring (feet, GS)
		Lat	Long	TOIC (feet, NAD27)	GS (feet, NAD27)			Top	Bottom	Top	Bottom	
<b>Operating Permit Monitoring Wells</b>												
MW-5 (8005-3477)	D	37.4638	-87.0910	469.14	467.42	75.0	2 inch / PVC	404.92	391.42	402.92	392.92	76
MW-6 (8005-3476)	D	37.4614	-87.0910	433.06	431.12	53.5	2 inch / PVC	390.42	377.12	388.12	378.12	54
MW-7 (8005-3479)	D	37.4584	-87.0913	426.14	424.08	50.0	2 inch / PVC	386.58	373.18	384.58	374.58	50.9
MW-8 (8005-3475)	U / B	37.4682	-87.0883	471.60	470.01	63.5	2 inch / PVC	419.53	405.96	417.05	407.05	64.05
MW-10 (8005-3478)	D	37.4544	-87.0902	398.91	396.91	22.4	2 inch / PVC	387.16	373.83	384.99	374.99	23.08
<b>Characterization Wells</b>												
MW-4D (8007-4811)	D / C	37.4542	-87.0851	410.02	407.03	96.4	2 inch / PVC	326.03	313.03	324.03	314.03	111
MW-102 (8007-2995)	D / C	37.4613	-87.0757	399.71	396.46	39.3	2 inch / PVC	372.46	360.46	370.46	360.46	36
MW-104 (8007-2994)	D / C	37.4517	-87.0826	392.87	389.76	43.4	2 inch / PVC	361.76	349.26	359.76	349.76	40
MW-105 (8007-2992)	D / C	37.4516	-87.0973	396.74	393.56	63.3	2 inch / PVC	366.56	333.56	343.56	333.56	60
MW-110 (8007-2996)	D / C	37.4521	-87.0907	393.54	390.56	42.8	2 inch / PVC	362.56	350.56	360.56	350.56	76 / 40
<b>Water Levels Only</b>												
P-9 (8005-3480)	water level only	37.4622	-87.0867	432.37	429.19	38.7	2 inch / PVC	402.99	389.99	400.99	390.99	39.2
P-11 (8005-3472)	water level only	37.4593	-87.0872	446.55	444.03	68.6	2 inch / PVC	388.43	374.90	385.93	375.93	69.13
MW-1 (8002-9621)	water level only	37.4667	-87.0852	443.89	442.31	36.3	4 inch / PVC	419.6	407.6	417.6	407.6	36
MW-2 (8002-9622)	water level only	37.4618	-87.0820	417.11	414.60	36.0	4 inch / PVC	393.3	381.1	391.1	381.1	36
MW-3 (8002-9623)	water level only	37.4576	-87.0845	411.12	408.19	36.2	4 inch / PVC	387.2	374.9	384.9	374.9	36
MW-4 (8002-9624)	water level only	37.4546	-87.0850	408.82	406.55	31.3	4 inch / PVC	389.6	377.5	387.5	377.5	31

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

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

PVC = Polyvinyl chloride

ID = Internal Diameter

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

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

U / B = Upgradient / Background

D = Downgradient

C = Characterization

**TABLE 2**  
**MONITORING WELL NETWORK GROUNDWATER ELEVATIONS**  
**WILSON PHASE II CCR LANDFILL**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

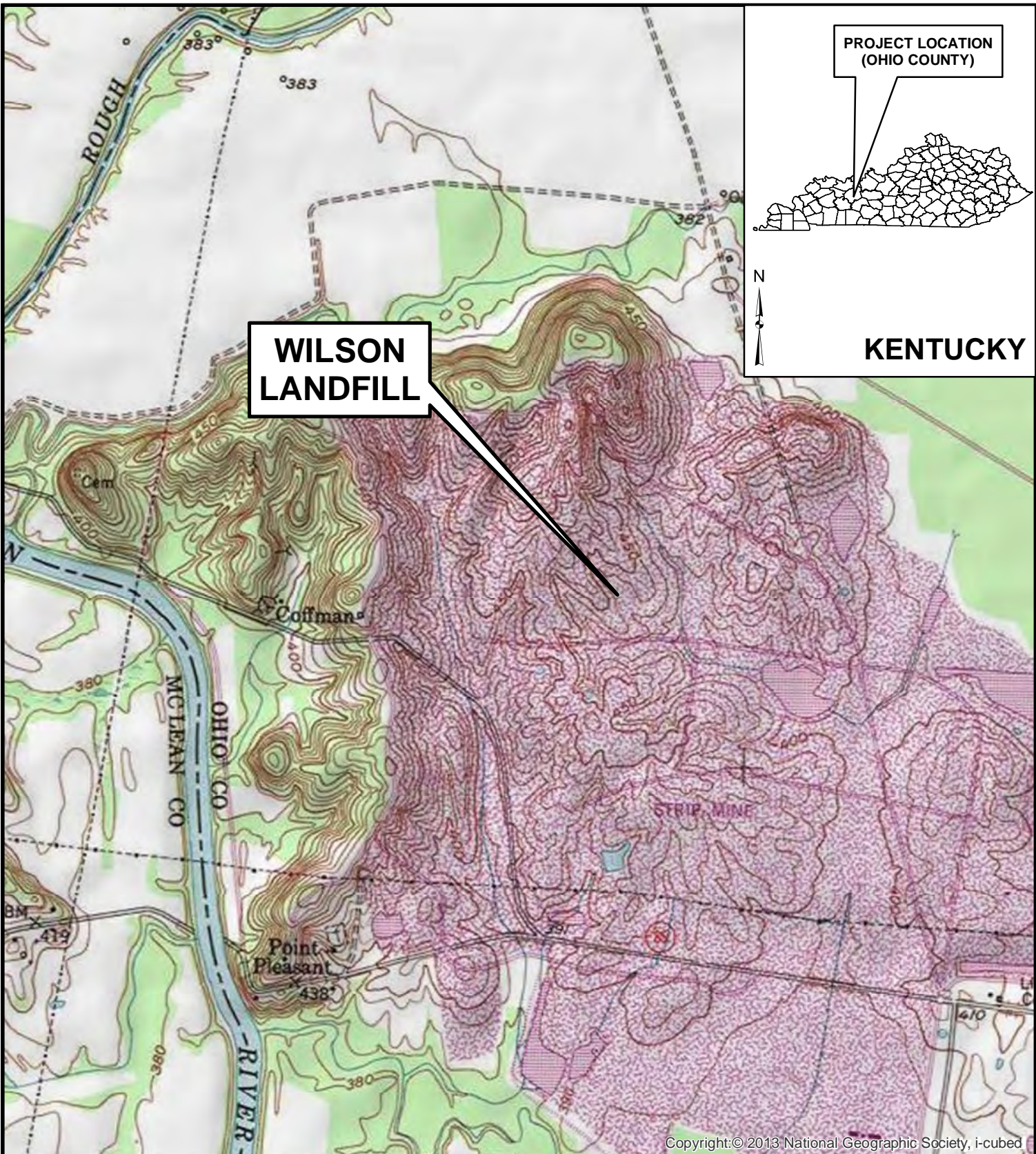
<b>WILSON PHASE II CCR LANDFILL</b>										
<b>OPERATING PERMIT GROUNDWATER MONITORING WELLS</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-5</b>		<b>MW-6</b>		<b>MW-7</b>		<b>MW-8</b>		<b>MW-10</b>	
	Downgradient 469.14		Downgradient 433.06		Downgradient 426.14		Upgradient/Background 471.60		Downgradient 398.91	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
1/24/2019	58.15	410.99	42.59	390.47	39.87	386.27	45.75	425.85	13.36	385.55
3/27/2019	54.60	414.54	40.78	392.28	39.38	386.76	43.16	428.44	13.34	385.57
7/31/2019	55.64	413.50	41.69	391.37	40.03	386.11	43.80	427.80	13.64	385.27
11/19/2019	58.86	410.28	43.23	389.83	40.01	386.13	46.18	425.42	13.08	385.83
<b>CHARACTERIZATION GROUNDWATER MONITORING WELLS</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-4D</b>		<b>MW-102</b>		<b>MW-104</b>		<b>MW-105</b>		<b>MW-110</b>	
	Characterization 410.02		Characterization 399.71		Characterization 392.87		Characterization 396.74		Characterization 393.54	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
1/24/2019	23.98	386.04	10.50	389.21	6.04	386.83	5.99	390.75	8.68	384.86
3/27/2019	23.85	386.17	11.19	388.52	6.68	386.19	5.75	390.99	8.73	384.81
7/31/2019	24.32	385.70	12.00	387.71	6.85	386.02	5.20	391.54	9.15	384.39
11/19/2019	23.96	386.06	11.71	388.00	7.21	385.66	7.35	389.39	8.96	384.58

**TABLE 2 (continued)**  
**GROUNDWATER ELEVATIONS**  
**SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

Reference Elevation TOIC*(ft, NAD27)	SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS								PEIZOMETERS			
	MW-1		MW-2		MW-3		MW-4		North (P9)		South (P11)	
	Water Level Only 443.89		Water Level Only 417.11		Water Level Only 411.12		Water Level Only 408.82		Water Level Only 432.37		Water Level Only 446.55	
Date Measured	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)	Depth to Water (ft) (feet)	GW Elevation (feet)
1/24/2019	17.8	426.09	17.71	399.4	24.46	386.66	22.82	386	25.41	406.96	60.45	386.10
3/27/2019	18	425.89	17.11	400	24.53	386.59	22.67	386.15	24.48	407.89	60.27	386.28
7/31/2019	19.06	424.83	17.93	399.18	25.00	386.12	23.12	385.70	23.95	408.42	60.80	385.75
11/19/2019	19.73	424.16	19.13	397.98	24.79	386.33	22.79	386.03	25.06	407.31	60.53	386.02

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

## Figures



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UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

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

0 1,500 3,000  
Feet



Wilson Station  
Ohio County, Kentucky

FIGURE 1  
GENERAL LOCATION MAP

DATE: 1/11/2019

SCALE: 1IN = 1,500 FEET

CREATED BY: ALW

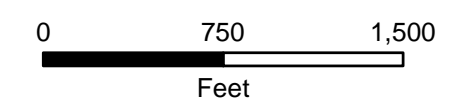
JOB NO. 60590960





**Legend**

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



Wilson Station Landfill  
Ohio County, Kentucky

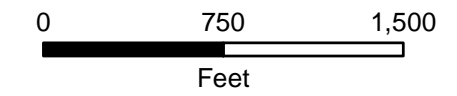
FIGURE 2  
WELL LOCATION MAP

DATE: 12/9/2019	SCALE: 1IN = 750 FEET
CREATED BY: ALW	
JOB NO. 60579935	



- Legend**
- ⋯ Property Boundary
  - ▭ CCR Phase 2 Fill
  - ▭ Bond Increment
  - ▭ KAR Permit Area
  - ⊕ Downgradient CCR Monitoring Well Location
  - ⊕ Upgradient CCR Monitoring Well Location
  - ⊕ Characterization Monitoring Well Location
  - Piezometer Location (Water Level Only)
  - ⊕ Monitoring Well Location (Water Level Only)
  - Water Table Contour (Inferred from Available Monitoring Data)
  - ➔ Groundwater Flow Direction
  - 409.69 Groundwater Elevation (Feet, NAD27) Measured November 4, 2018

\* Data for P-9, P11, and MW-4D was collected on 10/28/19.



**Big Rivers** *Wilson Landfill*  
 OHIO COUNTY, KENTUCKY

**FIGURE 3**  
 GROUNDWATER SURFACE MAP  
 NOVEMBER 2019

DATE: 11/21/2019	SCALE: 1IN = 750 FEET
CREATED BY: TMJ	
JOB NO. 60590960	

**Appendix A**  
**2009 Monitoring Well Completion Report**

**MONITORING WELL COMPLETION REPORT**

**D.B. WILSON SPECIAL WASTE LANDFILL  
SOLID WASTE PERMIT NUMBER 092-00004  
OHIO COUNTY, KENTUCKY**

**April 13, 2009**

**Prepared for:**

**Western Kentucky Energy  
145 North Main Street  
P.O. Box 1518  
Henderson, Kentucky 42419**

**Prepared By:**

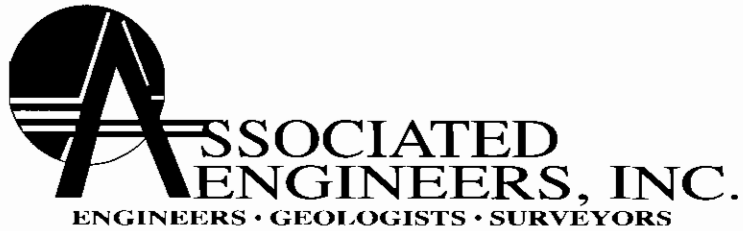


*CIVIL & MINING ENGINEERS*

**ASSOCIATED  
ENGINEERS, INC.**

2740 North Main St • Madisonville, KY 42431  
Phone (270) 821-7712 • Fax: (270) 821-7789

**AEI Project #080542**



April 13, 2009

Mr. Thomas L Shaw  
Western Kentucky Energy  
145 North Main Street  
P.O. Box 1518  
Henderson, Kentucky 42419

**RE: Monitoring Well Completion Report  
D.B. Wilson Station Special Waste Landfill  
Solid Waste Permit Number 092-00004  
Ohio County, Kentucky**

Dear Mr. Shaw:

Enclosed please find three copies of the above referenced Monitoring Well Completion Report for the proposed landfill expansion area. We appreciate the opportunity to be of service to you. If you have any questions regarding this report, please contact our office.

Sincerely,

G. Douglas Dunbar, P.G.  
Senior Geologist

**MONITORING WELL COMPLETION REPORT**

**D.B. WILSON SPECIAL WASTE LANDFILL  
SOLID WASTE PERMIT NUMBER 092-00004  
OHIO COUNTY, KENTUCKY**

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>		<b><u>PAGE NO.</u></b>
<b>1.0</b>	<b>GENERAL INFORMATION.....</b>	<b>1</b>
<b>2.0</b>	<b>DRILLING ACTIVITIES.....</b>	<b>1</b>
<b>3.0</b>	<b>WELL CONSTRUCTION ACTIVITIES.....</b>	<b>2</b>
<b>4.0</b>	<b>WELL DEVELOPMENT.....</b>	<b>3</b>
<b>5.0</b>	<b>WELL SURVEY.....</b>	<b>3</b>
<b>TABLES:</b>	<b>1. Monitoring Well/Piezometer Data</b>	<b>4</b>
<b>APPENDICES:</b>	<b>A. Uniform Kentucky Well Construction Records</b>	
<b>ATTACHMENTS:</b>	<b>Site Plan</b>	

# **MONITORING WELL COMPLETION REPORT**

## **D.B. WILSON SPECIAL WASTE LANDFILL SOLID WASTE PERMIT NUMBER 092-00004 OHIO COUNTY, KENTUCKY**

### **1.0 GENERAL INFORMATION**

This report summarizes the monitoring well and piezometer completion activities required to implement the Revised Groundwater Monitoring Plan for the proposed expansion area at the D.B. Wilson Special Waste Landfill.

Five monitoring wells and two piezometers were completed at locations shown on the attached Site Plan.

All of the wells/piezometers are located in an area of reclaimed surface mining. As previously ascertained, the uppermost aquifer is the reclaimed mine spoil. All wells were terminated in spoil.

### **2.0 DRILLING ACTIVITIES**

The wells/piezometers were drilled, constructed, and developed between January 14, 2009 and February 16, 2009. Work was impacted by severe weather conditions. Extra time was taken as necessary to insure that all Solid Waste Branch (SWB) requirements were met.

The Drilling Contractor was American Drilling Services (ADS), Indianapolis, Indiana. In addition to ADS personnel, drilling, construction and development procedures were supervised by Douglas Dunbar and Scott Duckworth with Associated Engineers, Inc. Timothy Hall with Western Kentucky Energy assisted in supervision and facilitation of activities.

Boreholes were completed using a CME 750 ATV drill. Holes were advanced by 6 1/4" I.D. hollow stem auger (HSA) or 6 1/8" air hammer with a filtration system capable of removing 99.999% of 0.3 micron particles. It was originally intended to use the air hammer in all holes except for the most shallow; however use of the required air compressor was severely limited by very wet conditions restricting site access and by very cold temperature which inhibited reliable starting. As a result, the air hammer was used in only borehole – P-11.

The drill rig and all down hole equipment were thoroughly cleaned at the D.B. Wilson facilities prior to beginning drilling. The rig and downhole equipment were subsequently decontaminated prior to moving to each well/piezometer site by pressure washing with a steam cleaner using potable water. Decontamination activities took place in the equipment cleaning building identified on the attached Site Plan or on a pad set up on the north side of the building. The interior cleaning site has a concrete floor. Heavy-duty plastic sheeting was installed at the exterior site. All drill cuttings, and

spoil/soil material generated by decontamination were contained and covered for disposal in the existing Phase I waste area by Western Kentucky Energy. Plastic sheeting was installed in the active work area during drilling to contain cuttings. Cuttings were covered in plastic prior to leaving each site and left in charge of Western Kentucky Energy for disposal.

Each borehole was logged during advancement by observation of cuttings and drilling characteristics. Particular attention was given to water content of cuttings

### **3.0 WELL CONSTRUCTION ACTIVITIES**

Well/piezometer construction details are provided in the Uniform Kentucky Well Construction Records and Well Construction Diagrams found in Appendix A.

The Revised Groundwater Monitoring Plan dated 5/2/08 included installation details and proposed locations for monitoring wells. It stipulated that the wells were to be screened in the upper 10 ft. of the encountered saturated zone. Subsequently, SWB approved the locations as shown on the Site Plan submitted with this report. Locations P-9 and P-11 were approved for use as piezometers to obtain static water levels only. Water quality sampling and testing not required. Additionally SWB allowed installation of 2" I.D wells and piezometers with screens a maximum of 10 ft. in length.

During field operations SWB required that P-9 and P-11 be completed following the same procedures as monitoring wells to allow future sampling and testing if necessary. Since water removal was required during development, monitoring well records were submitted to the Division of Water although they are not presently being used for water quality testing.

Since identifying the saturated zone was critical to proper well installation, it was deemed advantageous to begin well installation at the site closest to the existing impoundments at the south end of the proposed expansion (MW-10) and then move toward the north. Based on water level measurements in existing wells and potentiometric surface mapping of this data, it was considered probable that the water surface elevations in the pit would closely match the top of the saturated zone in MW-10 and the saturated zone would generally rise toward the north.

All well completions were successful in penetrating the saturated zone identified based on visual observation. As approved by SWB during field operations, some well screens were set slightly deeper than the upper 10 ft. of the encountered saturated zone. The deepest, MW-7, was set 12.6 ft. below the top of the zone.

In P-11, a limestone boulder directly overlying a void was encountered from 47.0 ft. to 48.7 ft. This interval was above the saturated zone (57 ft.) and bentonite pellet seal (top at 51.5 ft.). Approximately 1238 gallons of bentonite grout were required to plug the void and bring the grout up to within 3 ft. of the surface.

During installation of MW-10, the use of bentonite chips was approved for placement in the annulus from the top of the sand filter pack up to within 3 ft. of the ground surface. This is considered



acceptable since depth to the filter pack is only 9.75 ft. A bentonite pellet seal followed by bentonite grout was used above the filterpack in the remaining wells/piezometers. Density of bentonite grout was checked using a mud scale prior to placement by the tremie method.

A 6 1/8" diameter air hammer was used only in piezometer P-11. Use was approved during field operations.

Remaining well construction activities were completed in accordance with the document A Guide for Monitoring Well Construction and Abandonment-Solid Waste Branch.

#### **4. WELL DEVELOPMENT**

After waiting a minimum of 24 hours after installation of the surface pad and outer protective surface casing, wells were developed by pumping while monitoring ph, temperature, and specific conductivity. Approval was granted to discharge water down-slope from the well. Stabilization was achieved in all wells with the exception of the turbidity in MW-10. This well exhibits very slow recovery which allows only one well volume of water to be purged at a given time. 24 hours is required for full recovery. Apparently the spoil contains a high percentage of relatively fine grained, impermeable clay at this location. The relatively shallow depth and location may also be a factor, possibly resulting in greater compaction by heavy equipment. Subsequent pumping events have been conducted with elevated turbidity still exhibited to date.

#### **5. WELL SURVEY**

After installation of the surface pad and outer protective surface casing was completed for all wells, elevation of the top of the PVC casing and concrete pad were surveyed by Associated Engineers, Inc. The top of the pad is essentially the same as the ground elevation around the wells. Elevations are included in the Uniform Kentucky Well Construction Records and are also tabulated in Table 1. While obtaining this data, casing and pad elevations were surveyed for existing wells MW-1 through MW-4 (Phase I Waste Area). Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum.

**APPENDIX A**

**Uniform Kentucky Well Construction Records**

**TABLE 1. MONITORING WELL/PIEZOMETER DATA**

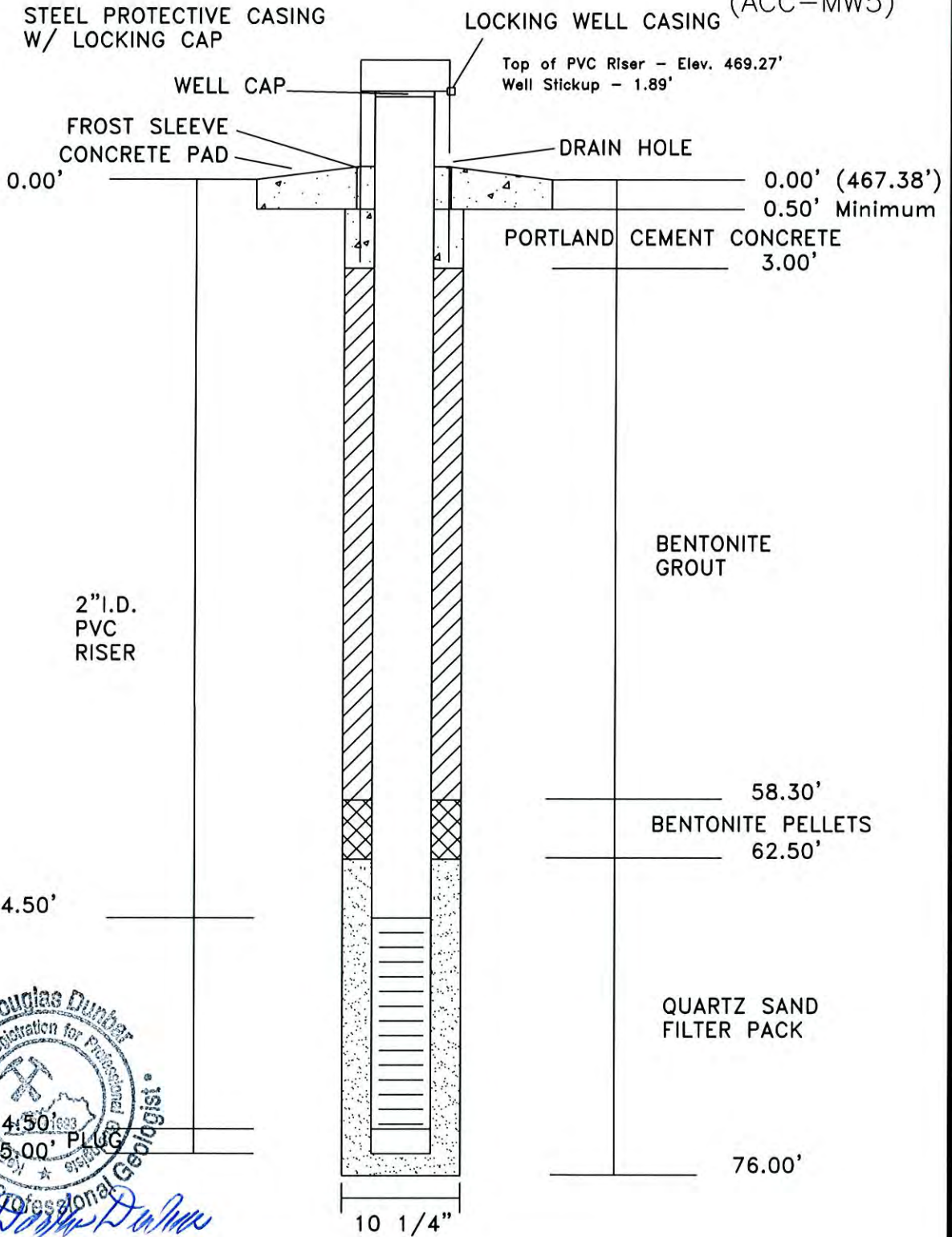
WKE Site No.	DOW Site No.	Well/Piezometer	Top Casing Elev. (ft.)	Top Pad Elev. (ft.)	Location
MW-5	8005-3477	Well	469.27	467.38	Proposed Expansion Area
MW-6	8005-3476	Well	433.06	431.16	
MW-7	8005-3479	Well	426.20	424.15	
MW-8	8005-3475	Well	471.77	469.94	
P-9	8005-3480	Piezometer	423.28	421.24	
MW-10	8005-3478	Well	398.84	396.96	
P-11	8005-3472	Piezometer	446.65	444.02	
MW-1		Well	444.08	442.33	Phase I Waste Area
MW-2		Well	417.20	414.65	
MW-3		Well	411.08	408.25	
MW-4		Well	408.89	406.65	

**APPENDIX A**

**Uniform Kentucky Well Construction Records**

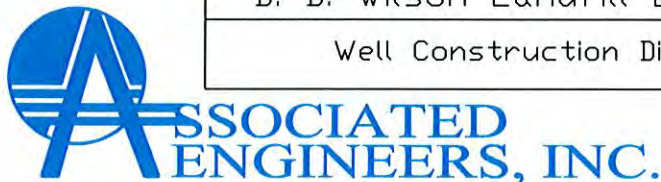
UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable)					
Use this form to report installation of monitoring or water wells. Original copy must be submitted to Division of Water within 30 days of completion. See instructions on reverse of form. Do not write in shaded areas. Record must be typed or neatly printed or it will be returned to the driller as unacceptable. One copy to Division of Water, one copy to owner, one copy to driller's files.				Water wells: yellow labels Monitoring wells: blue labels					
1. Owner name <b>Big Rivers Electric Corporation</b>				1. Kentucky Well ID (AKGWA) Number <b>8005-3477</b>					
5. Owner address <b>P. O. Box 24</b>				2. Owner Well ID # <b>ACC-MW-5</b>					
6. City <b>Henderson</b>		7. State <b>KY</b>		8. Zip <b>42419-0024</b>		3. Attachments Required			
If site name and address differ from owner name and address:				1. Site plan or sketch map <input type="checkbox"/>					
9. Site name <b>D.B. Wilson Station</b>				2. Well location On topographic map, OR <input type="checkbox"/> Obtained by GPS unit <input type="checkbox"/>					
10. Site address <b>Highway 85</b>				Conditionally Required					
11. City <b>Centertown</b>		12. State <b>KY</b>		13. Zip <b>42328</b>		3. Well diagram (monitoring well) <input type="checkbox"/>			
14. Agency Interest (AI) Number <b>3319</b>		15. Facility type & ID Number <input type="checkbox"/> CERCLA <input type="checkbox"/> Solid Waste <input type="checkbox"/> Drinking Water <input type="checkbox"/> RCRA <input type="checkbox"/> UST <input type="checkbox"/> Site Assessment <b>Special Waste Landfill</b>		31. Work start date <b>Feb 03 2009</b>		4. Coliform analysis (if applicable) <input type="checkbox"/>			
16. Owner phone <b>(270) 844-6031</b>		17. Site phone <b>(270) 821-7343</b>		32. Work end date <b>Feb 13 2009</b>		5. Signed variance (if applicable) <input type="checkbox"/>			
18. USGS topo map <b>Equality</b>				22. Physiographic Region <input type="checkbox"/> Bluegrass <input type="checkbox"/> Ohio River Alluvium <input type="checkbox"/> E. Coal Field <input checked="" type="checkbox"/> W. Coal Field <input type="checkbox"/> Miss. Plateau <input type="checkbox"/> Jackson Purchase					
19. County <b>Ohio</b>		20. Surface elevation (ft) <b>467.38</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input checked="" type="checkbox"/> Survey <input type="checkbox"/> Prior well log		33. Total depth (ft) <b>76.00</b>			
23. Well Use <input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump <input type="checkbox"/> Domestic <input type="checkbox"/> HVAC <input type="checkbox"/> Industrial <input type="checkbox"/> Injection <input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining <input type="checkbox"/> Public <input type="checkbox"/> Unused				24. Drilling method <input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash <input type="checkbox"/> Auger - SS <input type="checkbox"/> Pushprobe <input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air <input checked="" type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse <input type="checkbox"/> Core <input type="checkbox"/> Sand point <input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic <input type="checkbox"/> Excavation <input type="checkbox"/> Unknown <input type="checkbox"/> Combined - HS auger & air rotary				34. Depth to bedrock (ft) _____	
25. Well status <input checked="" type="checkbox"/> Active <input type="checkbox"/> Inactive <input type="checkbox"/> Unusable for intended use				26. Wellhead <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Locking <input type="checkbox"/> Well cap <input type="checkbox"/> Sanitary seal				35. Static water level (ft) <b>63.75</b>	
27. Well completion: Casing and screens				28. Annulus fill and seal				36. Casing height above surface (in) <b>22.88</b>	
29. Lithologic log (if more space is needed, continue on separate page)				30. Sketch map <input checked="" type="checkbox"/> Site plan/sketch map attached on separate page				37. Estimated well yield _____ <input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd	
31. Comments <b>6 1/4" HSA advanced to 76.0'. Sand placed 75.0' - 76.0'. 2" PVC screen and riser installed. Sand placed 62.50' - 75.0'. Bentonite pellets 58.30 - 62.50'. Bentonite tremie grouted 3.0' - 58.30'. Protactive casing installed in concrete pad.</b>				32. Apparent quality and odor: APPEARANCE <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Muddy <input type="checkbox"/> Turbid ODOR <input type="checkbox"/> none <input type="checkbox"/> slight <input type="checkbox"/> mod <input type="checkbox"/> high <input type="checkbox"/> Iron <input type="checkbox"/> Sulfur <input type="checkbox"/> Salt				38. Well service _____ # of people served	
33. Affirmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note: the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.				34. COLIFORM TEST 45. Coliform test type <input type="checkbox"/> fecal <input type="checkbox"/> fecal and total 46. Coliform test results <input type="checkbox"/> 0 or <1.0 <input type="checkbox"/> TNTC <input type="checkbox"/> Confluent or _____ # colonies per 100 ml				39. Date Sampled _____ Day _____ Year _____	
Signature of certified driller <b>Steve Jones</b>				Date signed <b>4/9/09</b>				40. Date Analyzed _____ Month _____ Day _____ Year _____	
Certification number <b>0373-0259-01</b>				Drilling company <b>American Drilling Services</b>				41. Latitude _____ DMS or Decimal _____	
								42. Longitude _____ DMS or Decimal _____	
								43. Lat/Long method <input type="checkbox"/> INT <input type="checkbox"/> GPS <input type="checkbox"/> SUR <input type="checkbox"/> REP	
								Date Received _____	
								Latitude of restorer _____	

MONITORING WELL 8005-3477  
(ACC-MW5)



*G. Douglas Dunbar*  
 Registered Professional Geologist  
 Board of Registration for Professional Geologists  
 74.50  
 75.00 PLUG  
*J. Dunbar*  
 7-30-09

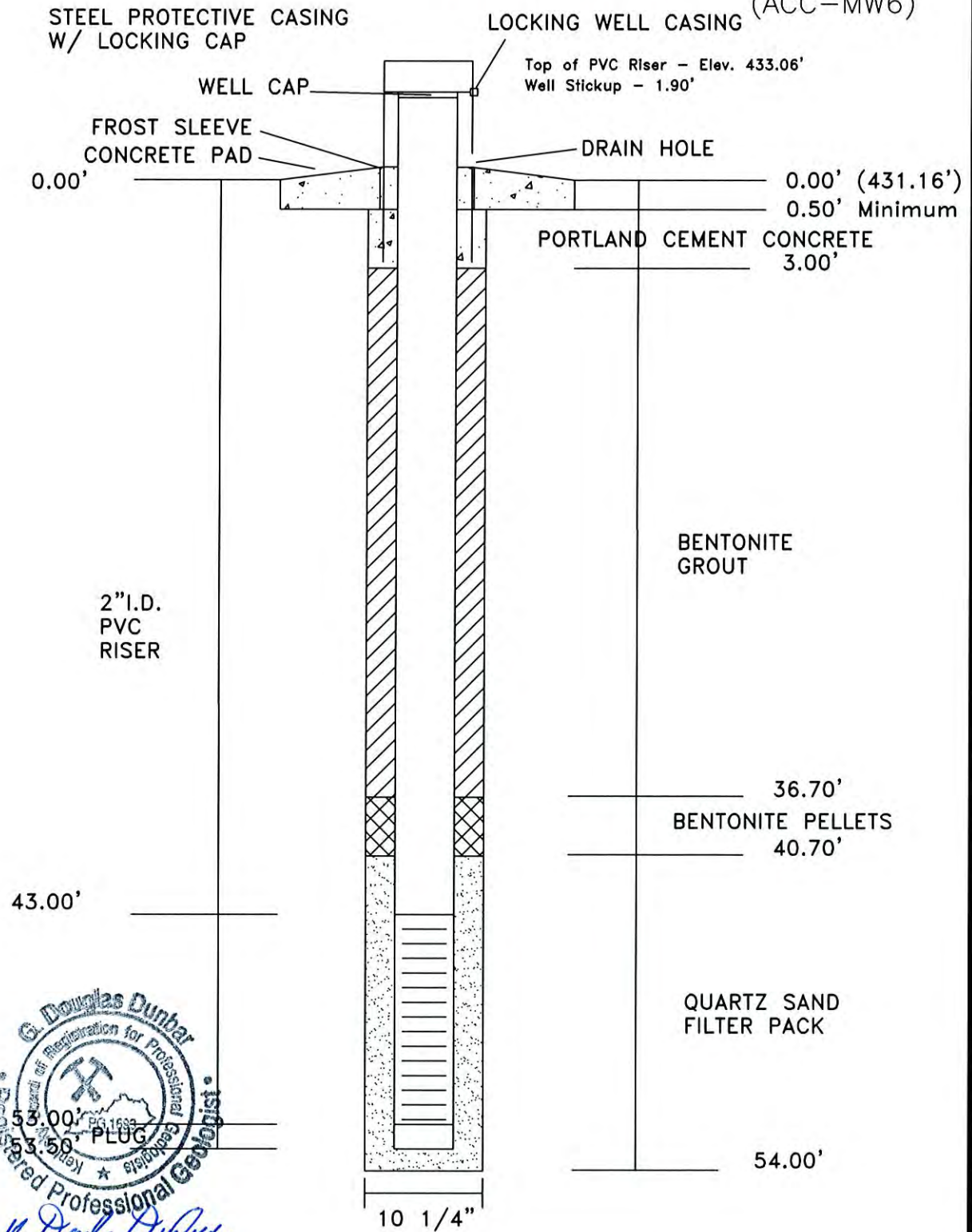
D. B. Wilson Landfill Expansion Well Construction Diagram	Job Number: 080542	Revisions:
	Date: 2-10-2009	S. Duckworth
	Scale: No Scale	
	Drawn By: D. Dunbar	



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UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable)			
Use this form to report installation of monitoring or water wells. Original copy must be submitted to Division of Water within 30 days of completion. See instructions on reverse of form. Do not write in shaded areas. Record must be typed or neatly printed or it will be returned to the driller as unacceptable. One copy to Division of Water, one copy to owner, one copy to driller's files.				Water wells: yellow labels Monitoring wells: blue labels			
4. Owner name Big Rivers Electric Corporation				1. Kentucky Well ID (AKGWA) Number 8 0 0 5 - 3 4 7 6			
5. Owner address P. O. Box 24				2. Owner Well ID # ACC-MW6			
6. City Henderson		7. State KY		8. Zip 42419-0024		3. Attachments Required	
If site name and address differ from owner name and address:				1. Site plan or sketch map <input type="checkbox"/>			
9. Site name D.B. Wilson Station				2. Well location On topographic map, OR <input type="checkbox"/> Obtained by GPS unit <input type="checkbox"/>			
10. Site address Highway 85				Conditionally Required			
11. City Centertown		12. State KY		13. Zip 42328		3. Well diagram (monitoring well) <input type="checkbox"/>	
14. Agency Interest (AI) Number 3319				15. Facility type & ID Number Special Waste Landfill		4. Coliform analysis (if applicable) <input type="checkbox"/>	
16. Owner phone (270) 844-6031				17. Site phone (270) 821-7343		5. Signed variance (if applicable) <input type="checkbox"/>	
18. USGS topo map Equality				22. Physiographic Region		6. Other laboratory analysis report <input type="checkbox"/>	
19. County Ohio				23. Bluegrass <input type="checkbox"/> Ohio River Alluvium <input type="checkbox"/>		31. Work start date Feb 05 2009	
20. Surface elevation (ft) 431.16		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input type="checkbox"/> Survey <input type="checkbox"/> Prior well log		24. E. Coal Field <input type="checkbox"/> W. Coal Field <input type="checkbox"/>		32. Work end date Feb 12 2009	
23. Well Use		24. Drilling method		25. Well status		Please report depths in feet below surface, not as relative elevations	
<input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Jet wash		<input type="checkbox"/> Auger - HS <input type="checkbox"/> Push/probe		<input type="checkbox"/> Active		33. Total depth (ft) 54.00	
<input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump		<input type="checkbox"/> Auger - SS <input type="checkbox"/> Rotary - air		<input type="checkbox"/> Inactive		34. Depth to bedrock (ft)	
<input type="checkbox"/> Domestic <input type="checkbox"/> HVAC		<input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - mud		<input type="checkbox"/> Unsuitable for intended use		35. Static water level (ft) 43.18	
<input type="checkbox"/> Industrial <input type="checkbox"/> Injection		<input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - reverse		26. Wellhead		36. Casing height above surface (in) 22.80	
<input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining		<input type="checkbox"/> Cable tool <input type="checkbox"/> Sand point		<input type="checkbox"/> Flush <input type="checkbox"/> Locking		WATER WELLS ONLY	
<input type="checkbox"/> Public <input type="checkbox"/> Unused		<input type="checkbox"/> Core <input type="checkbox"/> Sonic		<input type="checkbox"/> Well cap		37. Estimated well yield	
		<input type="checkbox"/> Excavation <input type="checkbox"/> Unknown		<input type="checkbox"/> Sanitary seal		<input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd	
		<input type="checkbox"/> Combined - HS auger & air rotary				38. Well service # of people served	
27. Well completion: Casing and screens				28. Annulus fill and seal			
From depth, ft. To depth, ft. Borehole diameter Casing diameter Casing type Screen slot size				From depth, ft. To depth, ft. Material			
0.00 43.00 10 1/4" 2" ID PVC				0.00 3.00 Concrete			
43.00 53.00 10 1/4" 2" ID PVC screen 0.010				3.00 36.70 Bentonite			
53.00 53.50 10 1/4" 2" ID PVC				36.70 40.70 Bentonite pellets			
53.50 54.00 10 1/4" 2" ID Open hole				40.70 54.00 Sand			
29. Lithologic log (if more space is needed, continue on separate page)				30. Sketch map			
From depth, ft. To depth, ft. Description (include any show of water and indicate apparent quality)				<input checked="" type="checkbox"/> Site plan/sketch map attached on separate page			
0.00 1.00 Mine spoil - top soil							
1.00 4.00 Mine spoil - yellowish brown clay							
4.00 5.00 Mine spoil - limestone boulder							
5.00 54.00 Mine spoil - yellowish brown clay, wet at 41.4'							
49. Comments				47. Date Sampled			
6 1/4" HSA advanced to 54.00'. Sand placed 53.50' - 54.00'. 2" PVC screen and riser installed. Sand placed 40.70' - 53.50'. Bentonite pellets 38.70' - 40.70'. Bentonite tremie grouted 3.00' - 36.70'. Protective casing installed in concrete pad.				Day Year			
50. Affirmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note: the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.				48. Date Analyzed			
Signature of certified driller <i>Steve Jones</i>				Month Day Year			
Date signed 9/9/09				Date Received			
Certification number 0373-0259-01				Drilling company American Drilling Services			
				Latitude or Decimal			
				Longitude or Decimal			
				Lat/Long method <input type="checkbox"/> INT <input type="checkbox"/> GPS <input type="checkbox"/> SUR <input type="checkbox"/> REP			
				Tables of reference			

MONITORING WELL 8005-3476  
(ACC-MW6)



*G. Douglas Dunbar*  
 Registered Professional Geologist  
 Board of Registration for Professional Geologists  
 Kentucky  
 No. 1688  
 PLUG  
*D. B. Wilson*  
 7-30-09

D. B. Wilson Landfill Expansion

Job Number: 080542

Revisions:

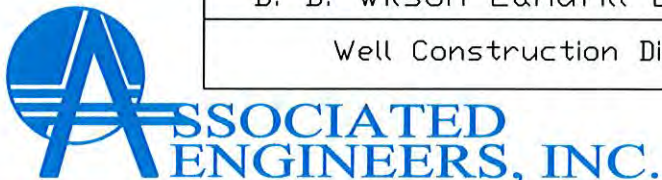
Date: 2-10-2009

S. Duckworth

Well Construction Diagram

Scale: No Scale

Drawn By: D. Dunbar

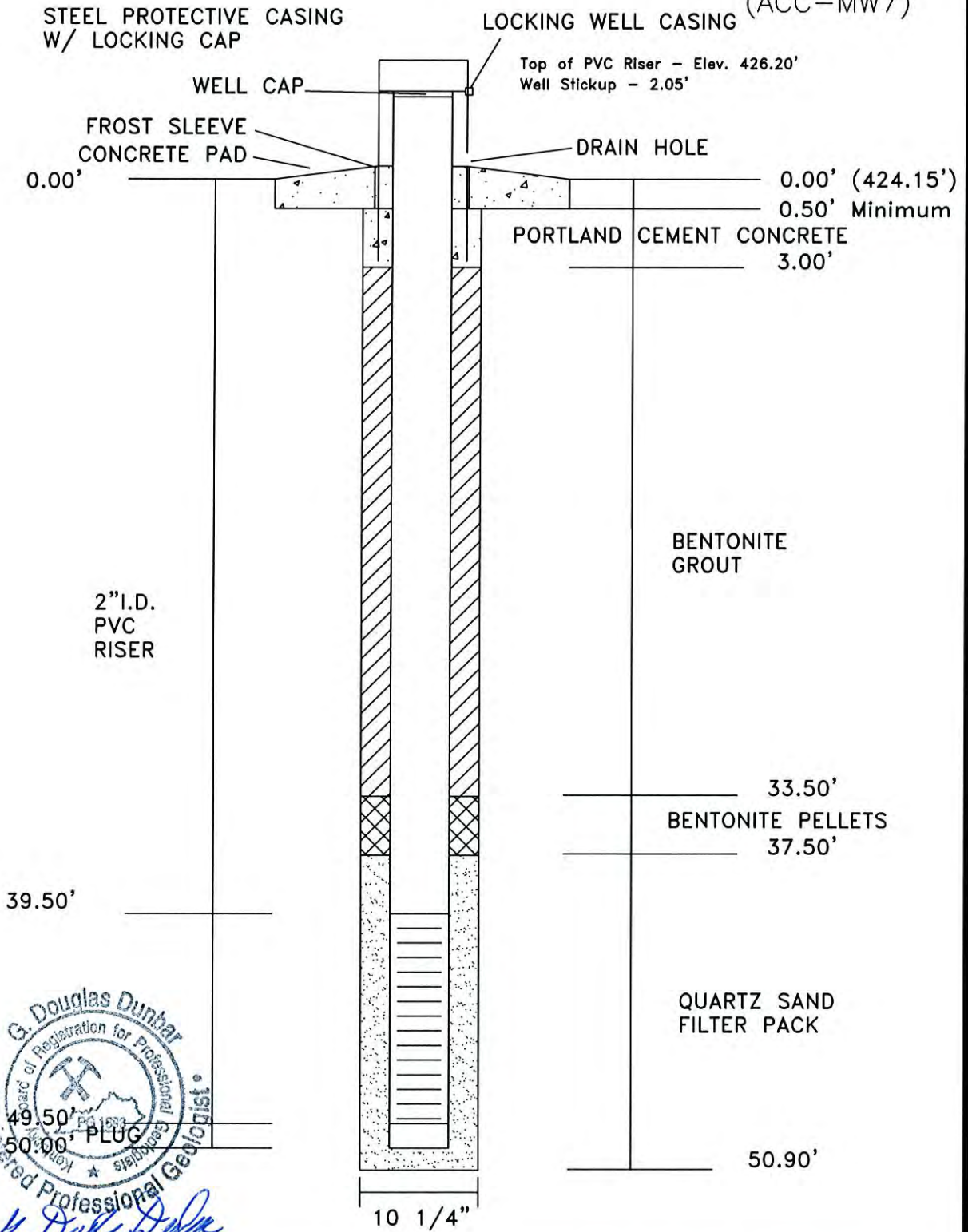


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UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable)			
Use this form to report installation of monitoring or water wells. Original copy must be submitted to Division of Water within 30 days of completion. See instructions on reverse of form. Do not write in shaded areas. Record must be typed or neatly printed or it will be returned to the driller as unacceptable. One copy to Division of Water, one copy to owner, one copy to driller's files.				Water wells: yellow labels Monitoring wells: blue labels			
4. Owner name <b>Big Rivers Electric Corporation</b>				1. Kentucky Well ID (ARGWA) Number <b>8005 - 3479</b>			
5. Owner address <b>P. O. Box 24</b>				2. Owner Well ID # <b>ACC-MW-7</b>			
6. City <b>Henderson</b>		7. State <b>KY</b>		8. Zip <b>42419-0024</b>		3. Attachments Required	
If site name and address differ from owner name and address:				1. Site plan or sketch map <input type="checkbox"/>			
9. Site name <b>D.B. Wilson Station</b>				2. Well location On topographic map, QB <input type="checkbox"/> Obtained by GPS unit <input type="checkbox"/>			
10. Site address <b>Highway 85</b>				Conditionally Required			
11. City <b>Centertown</b>		12. State <b>KY</b>		13. Zip <b>42328</b>		3. Well diagram (monitoring well) <input type="checkbox"/>	
14. Agency Interest (AI) Number <b>3319</b>		15. Facility type & ID Number <b>Special Waste Landfill</b>		16. Agency Interest (AI) Number <b>3319</b>		4. Coliform analysis (if applicable) <input type="checkbox"/>	
15. Facility type & ID Number <b>Special Waste Landfill</b>		16. Agency Interest (AI) Number <b>3319</b>		17. Agency Interest (AI) Number <b>3319</b>		5. Signed variance (if applicable) <input type="checkbox"/>	
16. Agency Interest (AI) Number <b>3319</b>		17. Agency Interest (AI) Number <b>3319</b>		18. Agency Interest (AI) Number <b>3319</b>		6. Other laboratory analysis report <input type="checkbox"/>	
16. Owner phone <b>(270) 844-6031</b>		17. Site phone <b>(270) 821-7343</b>		31. Work start date Month: <b>Feb</b> Day: <b>05</b> Year: <b>2009</b>		32. Work end date Month: <b>Feb</b> Day: <b>12</b> Year: <b>2009</b>	
18. USGS topo map <b>Equality</b>				22. Physiographic Region			
19. County <b>Ohio</b>				<input type="checkbox"/> Bluegrass <input type="checkbox"/> Ohio River Alluvium			
20. Surface elevation (ft) <b>424.15</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input type="checkbox"/> Survey <input type="checkbox"/> Prior well log		<input type="checkbox"/> E. Coal Field <input type="checkbox"/> W. Coal Field		33. Total depth (ft) <b>50.90</b>	
20. Surface elevation (ft) <b>424.15</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input type="checkbox"/> Survey <input type="checkbox"/> Prior well log		<input type="checkbox"/> Miss. Plateau <input type="checkbox"/> Jackson Purchase		34. Depth to bedrock (ft)	
23. Well Use		24. Drilling method		25. Well status		35. Static water level (ft) <b>39.24</b>	
<input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal		<input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash		<input checked="" type="checkbox"/> Active		36. Casing height above surface (ft) <b>24.60</b>	
<input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump		<input type="checkbox"/> Auger - SS <input type="checkbox"/> Push/probe		<input type="checkbox"/> Inactive		37. Estimated well yield	
<input type="checkbox"/> Domestic <input type="checkbox"/> HVAC		<input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air		<input type="checkbox"/> Unsuitable for intended use		<input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd	
<input type="checkbox"/> Industrial <input type="checkbox"/> Injection		<input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud		26. Wellhead		38. Well service # of people served	
<input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining		<input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse		<input type="checkbox"/> Flush <input checked="" type="checkbox"/> Locking		39. Disinfectant amount 40. Type	
<input type="checkbox"/> Public <input type="checkbox"/> Unused		<input type="checkbox"/> Core <input type="checkbox"/> Send point		<input type="checkbox"/> Well cap		<input type="checkbox"/> oz <input type="checkbox"/> qts <input type="checkbox"/> cups <input type="checkbox"/> Hypo-chlorite	
		<input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic		<input type="checkbox"/> Sanitary seal		<input type="checkbox"/> lbs <input type="checkbox"/> gal	
		<input type="checkbox"/> Excavation <input type="checkbox"/> Unknown				41. Pitless adapter installed <input type="checkbox"/> Yes <input type="checkbox"/> No	
		<input checked="" type="checkbox"/> Combined - HS auger & air rotary				42. Pump installed:	
27. Well completion: Casing and screens				28. Annular fill and seal			
From depth, ft. To depth, ft. Borehole diameter Casing diameter Casing type Screen slot size				From depth, ft. To depth, ft. Material			
0.00 39.50 10 1/4" 2"ID PVC				0.00 3.00 Concrete			
39.50 49.50 10 1/4" 2"ID PVC screen 0.010				3.00 33.50 Bentonite			
49.50 50.00 10 1/4" 2"ID PVC				33.50 37.50 Bentonite pellets			
50.00 50.90 10 1/4" 2"ID Open hole				37.50 50.90 Sand			
29. Lithologic log (if more space is needed, continue on separate page)				38. Sketch map			
From depth, ft. To depth, ft. Description (include any show of water and indicate apparent quality)				<input checked="" type="checkbox"/> Site plan/sketch map attached on separate page			
0.00 1.00 Mine spoil - top soil							
1.00 50.90 Mine spoil - gray clay and gray shale, wet at 38.9'							
49. Comments				Latitude			
6 1/4" HSA advanced to 50.90'. Sand placed 50.00' - 50.90'. 2" PVC screen and riser installed. Sand placed 37.50' - 50.00'. Bentonite pellets 33.50' - 37.50'. Bentonite tremle grouted 3.00' - 33.50'. Protective casing installed in concrete pad.				DMS or Decimal °			
50. Affirmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note: the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.				Longitude			
Signature of certified driller <i>John J. [Signature]</i>				DMS or Decimal °			
Date signed <b>4/9/09</b>				Date Received			
Certification number <b>0373-0259-01</b>				Lat/Long method <input type="checkbox"/> INT <input type="checkbox"/> GPS <input type="checkbox"/> SUR <input type="checkbox"/> REP			
Drilling company <b>American Drilling Services</b>				Initials of reviewer			

MONITORING WELL 8005-3479  
(ACC-MW7)



G. Douglas Dunbar  
 Board of Registration for Professional Geologists  
 Registered Professional Geologist  
 49.50' PLUG  
 50.00'  
*G. Dunbar*  
 7-30-09

D. B. Wilson Landfill Expansion

Job Number: 080542

Revisions:

Date: 2-10-2009

S. Duckworth

Well Construction Diagram

Scale: No Scale

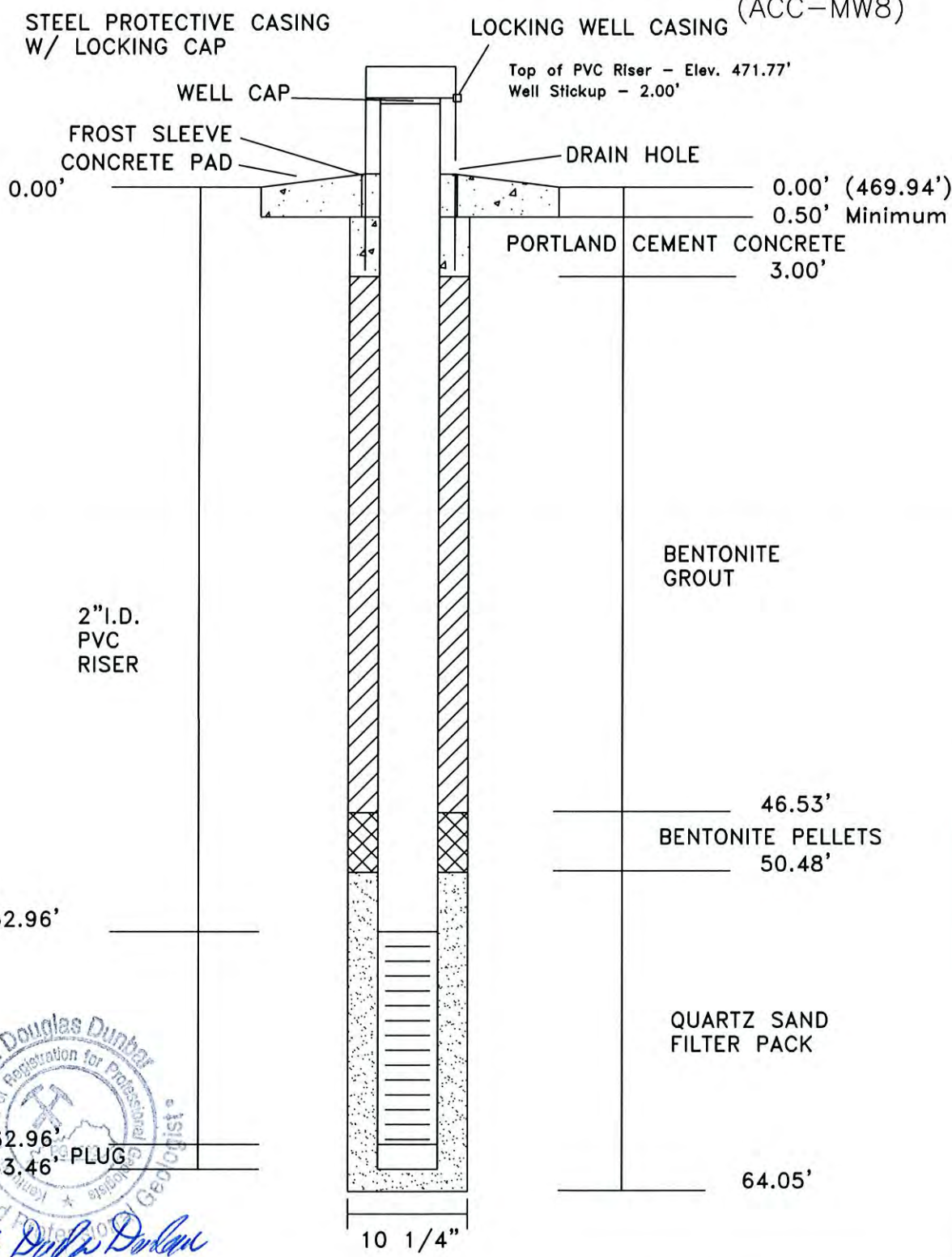
Drawn By: D. Dunbar



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 Phone: (270) 821-7732 • Fax: (270) 821-7789  
 www.associatedengineers.com

UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable)		
Use this form to report installation of monitoring or water wells. Original copy must be submitted to Division of Water within 30 days of completion. See instructions on reverse of form. Do not write in shaded areas. Record must be typed or neatly printed or it will be returned to the driller as unacceptable. One copy to Division of Water, one copy to owner, one copy to driller's files.				Water wells: yellow labels Monitoring wells: blue labels		
4. Owner name <b>Big Rivers Electric Corporation</b>			1. Kentucky Well ID (AKGWA) Number <b>8005 - 3475</b>			
5. Owner address <b>P. O. Box 24</b>			2. Owner Well ID # <b>ACC-MW-8</b>			
6. City <b>Henderson</b>		7. State <b>KY</b>	8. Zip <b>42419-0024</b>			
3. Attachments Required						
If site name and address differ from owner name and address:						
9. Site name <b>D.B. Wilson Station</b>			1. Site plan or sketch map <input type="checkbox"/>			
10. Site address <b>Highway 85</b>			2. Well location On topographic map, <input checked="" type="checkbox"/> OR Obtained by GPS unit <input type="checkbox"/>			
11. City <b>Centertown</b>		12. State <b>KY</b>	13. Zip <b>42328</b>			
14. Agency Interest (AI) Number <b>3319</b>			15. Facility type & ID Number <input type="checkbox"/> CERCLA <input type="checkbox"/> Solid Waste <input type="checkbox"/> Drinking Water <input type="checkbox"/> RCRA <input type="checkbox"/> UST <input type="checkbox"/> Site Assessment <b>Special Waste Landfill</b>			
16. Owner phone <b>(270) 844-6031</b>			17. Site phone <b>(270) 821-7343</b>			
18. USGS topo map <b>Equality</b>			22. Physiographic Region <input type="checkbox"/> Bluegrass <input type="checkbox"/> Ohio River Alluvium <input type="checkbox"/> E. Coal Field <input checked="" type="checkbox"/> W. Coal Field <input type="checkbox"/> Miss. Plateau <input type="checkbox"/> Jackson Purchase			
19. County <b>Ohio</b>			31. Work start date Month Day Year <b>Jan 26 2009</b>			
20. Surface elevation (ft) <b>469.94</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input checked="" type="checkbox"/> Survey <input type="checkbox"/> Prior well log		32. Work end date Month Day Year <b>Feb 13 2009</b>		
23. Well Use <input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump <input type="checkbox"/> Domestic <input type="checkbox"/> HVAC <input type="checkbox"/> Industrial <input type="checkbox"/> Injection <input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining <input type="checkbox"/> Public <input type="checkbox"/> Unused			24. Drilling method <input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash <input type="checkbox"/> Auger - SS <input type="checkbox"/> Push/probe <input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air <input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse <input type="checkbox"/> Core <input type="checkbox"/> Sand point <input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic <input type="checkbox"/> Excavation <input type="checkbox"/> Unknown <input type="checkbox"/> Combined - HS auger & air rotary		33. Total depth (ft) <b>64.05</b>	
27. Well completion: Casing and screens			25. Well status <input checked="" type="checkbox"/> Active <input type="checkbox"/> Inactive <input type="checkbox"/> Unsuitable for intended use			
28. Annulus fill and seal			26. Wellhead <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Locking <input type="checkbox"/> Well cap <input type="checkbox"/> Sanitary seal			
29. Lithologic log (if more space is needed, continue on separate page)			37. Estimated well yield <input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd			
30. Sketch map <input checked="" type="checkbox"/> Site plan/sketch map attached on separate page			38. Well service # of people served			
39. Lithologic log (if more space is needed, continue on separate page)			39. Disinfectant amount 40. Type			
41. Pitless adapter installed <input type="checkbox"/> Yes <input type="checkbox"/> No			42. Pump installed: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Turbine <input type="checkbox"/> Bellier or bucket <input type="checkbox"/> Hand <input type="checkbox"/> No pump			
43. Depth to intake (ft)			44. Apparent quality and odor:			
44. Apparent quality and odor:			APPEARANCE <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Muddy <input type="checkbox"/> Turbid ODOR <input type="checkbox"/> None <input type="checkbox"/> Light <input type="checkbox"/> Moderate <input type="checkbox"/> Strong <input type="checkbox"/> Iron <input type="checkbox"/> Sulfur <input type="checkbox"/> Salt			
45. Coliform test type <input type="checkbox"/> fecal <input type="checkbox"/> fecal and total			COLIFORM TEST			
46. Coliform test results <input type="checkbox"/> 0 or <1.0 <input type="checkbox"/> TNTC <input type="checkbox"/> Confluent or # colonies per 100 ml			47. Date Sampled Month Day Year			
47. Date Sampled			48. Date Analyzed Month Day Year			
49. Comments <b>6 1/4" HSA advanced to 64.05'. Sand placed 63.46' - 64.05'. 2" PVC screen and riser installed. Sand placed 50.48' - 63.46'. Bentonite pellets 46.53' - 60.48'. Bentonite tremle grouted 3.0' - 46.53'. Protective casing installed in concrete pad.</b>			Latitude DMS or Decimal			
50. A firmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note: the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.			Longitude DMS or Decimal			
Signature of certified driller <i>Steve J. Coe</i>			Date signed <b>4/9/09</b>			
Certification number <b>0373-0259-01</b>			Drilling company <b>American Drilling Services</b>			
Date Received			Initials of reviewer			

MONITORING WELL 8005-3475  
(ACC-MW8)



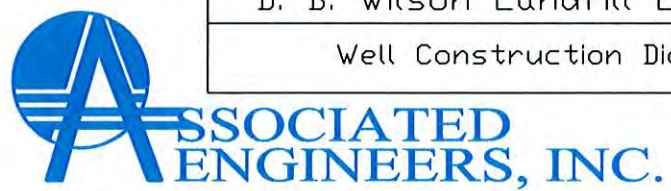
G. Douglas Dunbar  
 Registered Professional Geologist  
 State of Kentucky  
 62.96'  
 63.46' PLUG  
*H. Dunbar Dunbar*  
 7-30-09

D. B. Wilson Landfill Expansion

Job Number: 080542  
 Date: 2-10-2009  
 Scale: No Scale  
 Drawn By: D. Dunbar

Revisions:  
 S. Duckworth

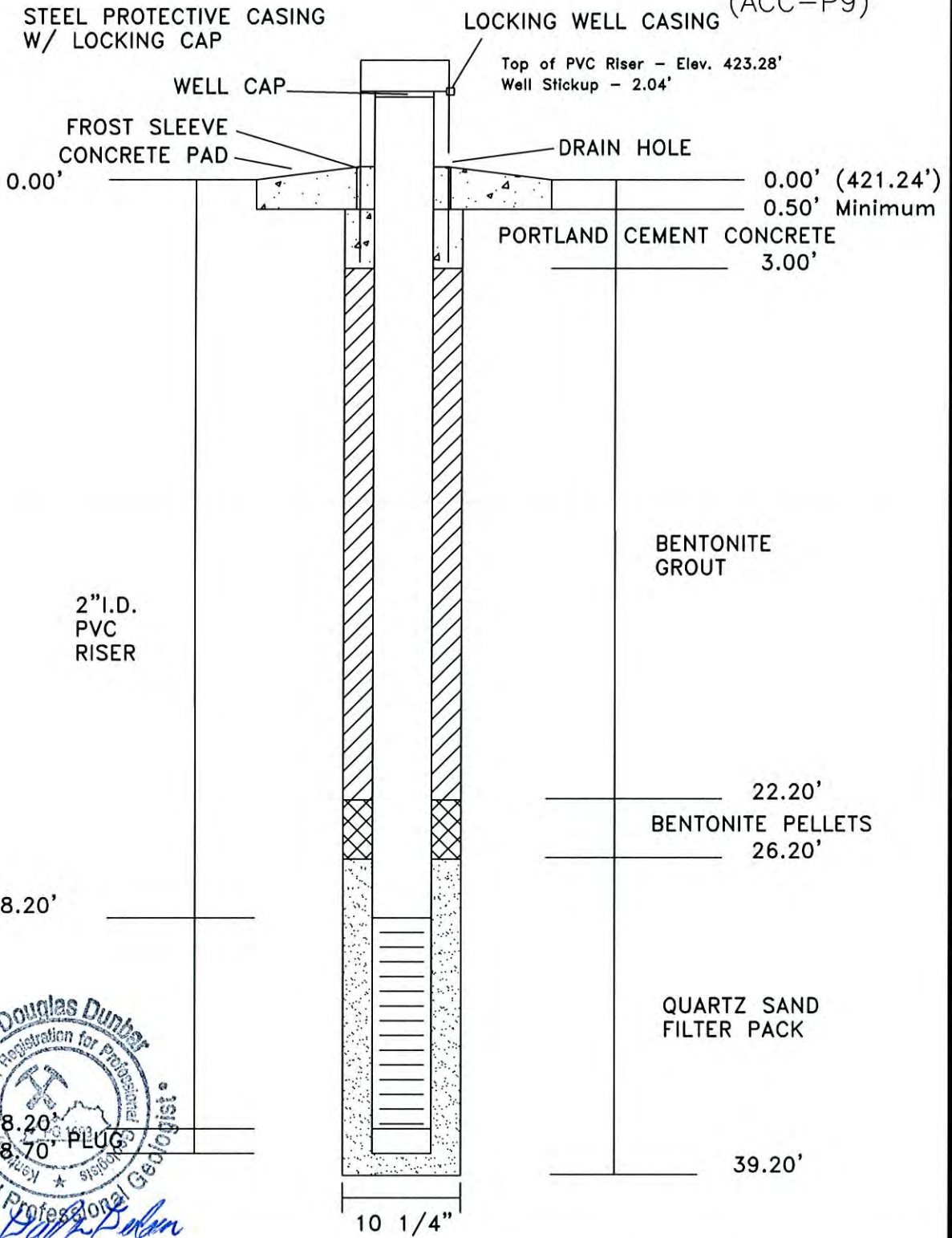
Well Construction Diagram



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<b>UNIFORM KENTUCKY WELL CONSTRUCTION RECORD</b> <small>Use this form to report installation of monitoring or water wells.            Original copy must be submitted to Division of Water within 30 days of completion.            See instructions on reverse of form. Do not write in shaded areas.            Record must be typed or neatly printed or it will be returned to the driller as unacceptable.            One copy to Division of Water, one copy to owner, one copy to driller's files.</small>				<b>Attach Well Identification Number Label Here (if applicable)</b> <b>Water wells: yellow labels</b> <b>Monitoring wells: blue labels</b>																																														
4. Owner name <b>Big Rivers Electric Corporation</b>				1. Kentucky Well ID (AKGWA) Number <div style="border: 1px solid black; padding: 2px;">             8 0 0 5 - 3 4 8 0           </div>																																														
5. Owner address <b>P. O. Box 24</b>				2. Owner Well ID # <b>ACC-P-9</b>																																														
6. City <b>Henderson</b>		7. State <b>KY</b>	8. Zip <b>42419-0024</b>		3. Attachments <b>Required</b> 1. Site plan or sketch map <input checked="" type="checkbox"/> 2. Well location On topographic map, OR <input checked="" type="checkbox"/> Obtained by GPS unit <input checked="" type="checkbox"/> <b>Conditionally Required</b> 3. Well diagram (monitoring well) <input checked="" type="checkbox"/> 4. Coliform analysis (if applicable) <input type="checkbox"/> 5. Signed variance (if applicable) <input type="checkbox"/> <b>Optional</b> 6. Other laboratory analysis report <input type="checkbox"/>																																													
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16. Owner phone <b>(270) 844-6031</b>		17. Site phone <b>(270) 821-7343</b>		Please report depths in feet below surface, not as relative elevations																																														
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19. County <b>Ohio</b>		20. Surface elevation (ft) <b>421.24</b>		21. Elevation determined by <input checked="" type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input checked="" type="checkbox"/> Survey <input type="checkbox"/> Prior well log																																														
23. Well Use <input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump <input type="checkbox"/> Domestic <input type="checkbox"/> HVAC <input type="checkbox"/> Industrial <input type="checkbox"/> Injection <input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining <input type="checkbox"/> Public <input type="checkbox"/> Unused		24. Drilling method <input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash <input type="checkbox"/> Auger - SS <input type="checkbox"/> Push/probe <input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air <input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse <input type="checkbox"/> Core <input type="checkbox"/> Sand point <input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic <input type="checkbox"/> Excavation <input type="checkbox"/> Unknown <input checked="" type="checkbox"/> Combined - HS auger & air rotary		25. Well status <input type="checkbox"/> Active <input checked="" type="checkbox"/> Inactive <input type="checkbox"/> Unsuitable for intended use 26. Wellhead <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Locking <input type="checkbox"/> Well cap <input checked="" type="checkbox"/> Sanitary seal																																														
<b>WATER WELLS ONLY</b>																																																		
37. Estimated well yield _____ <input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd																																																		
38. Well service _____ # of people served																																																		
39. Disinfectant amount _____ 40. Type _____ <input type="checkbox"/> oz <input type="checkbox"/> qts <input type="checkbox"/> cups <input type="checkbox"/> Bleach <input type="checkbox"/> lbs <input type="checkbox"/> gal <input type="checkbox"/> Hypochlorite																																																		
27. Well completion: Casing and screens <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>From depth, ft.</th> <th>To depth, ft.</th> <th>Borehole diameter</th> <th>Casing diameter</th> <th>Casing type</th> <th>Screen slot size</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>28.20</td> <td>10 1/4"</td> <td>2" ID</td> <td>PVC</td> <td></td> </tr> <tr> <td>28.20</td> <td>38.20</td> <td>10 1/4"</td> <td>2" ID</td> <td>PVC screen</td> <td>0.010</td> </tr> <tr> <td>38.20</td> <td>38.70</td> <td>10 1/4"</td> <td>2" ID</td> <td>PVC</td> <td></td> </tr> <tr> <td>38.70</td> <td>39.20</td> <td>10 1/4"</td> <td>2" ID</td> <td>Open hole</td> <td></td> </tr> </tbody> </table>				From depth, ft.	To depth, ft.	Borehole diameter	Casing diameter	Casing type	Screen slot size	0.00	28.20	10 1/4"	2" ID	PVC		28.20	38.20	10 1/4"	2" ID	PVC screen	0.010	38.20	38.70	10 1/4"	2" ID	PVC		38.70	39.20	10 1/4"	2" ID	Open hole		28. Annular fill and seal <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>From depth, ft.</th> <th>To depth, ft.</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>3.00</td> <td>Concrete</td> </tr> <tr> <td>3.00</td> <td>22.20</td> <td>Bentonite</td> </tr> <tr> <td>22.20</td> <td>26.20</td> <td>Bentonite pellets</td> </tr> <tr> <td>26.20</td> <td>39.20</td> <td>Sand</td> </tr> </tbody> </table>		From depth, ft.	To depth, ft.	Material	0.00	3.00	Concrete	3.00	22.20	Bentonite	22.20	26.20	Bentonite pellets	26.20	39.20	Sand
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43. Depth to intake (ft) _____																																																		
44. Apparent quality and odor: APPEARANCE <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Muddy <input type="checkbox"/> Turbid ODOUR <input type="checkbox"/> none <input type="checkbox"/> slight <input type="checkbox"/> mod <input type="checkbox"/> high <input type="checkbox"/> Iron <input type="checkbox"/> Sulfur <input type="checkbox"/> Silt																																																		
COLIFORM TEST 45. Coliform test type <input type="checkbox"/> fecal <input type="checkbox"/> fecal and total 46. Coliform test results <input type="checkbox"/> 0 or <1.0 <input type="checkbox"/> TNTC <input type="checkbox"/> Confluent or _____ # colonies per 100 ml																																																		
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Signature of certified driller <i>Steve Jones</i>				Date signed <b>4/9/09</b>																																														
Certification number <b>0373-0259-01</b>		Drilling company <b>American Drilling Services</b>		Date Received _____																																														
Initials of reviewer _____																																																		

MONITORING WELL 8005-3480  
(ACC-P9)



G. Douglas Dunbar  
Board of Registration for Professional Geologists  
38.20' PLUG  
38.70'  
Registered Professional Geologist  
S. Duckworth  
7-30-09

D. B. Wilson Landfill Expansion

Well Construction Diagram

Job Number: 080542

Date: 2-10-2009

Scale: No Scale

Drawn By: D. Dunbar

Revisions:

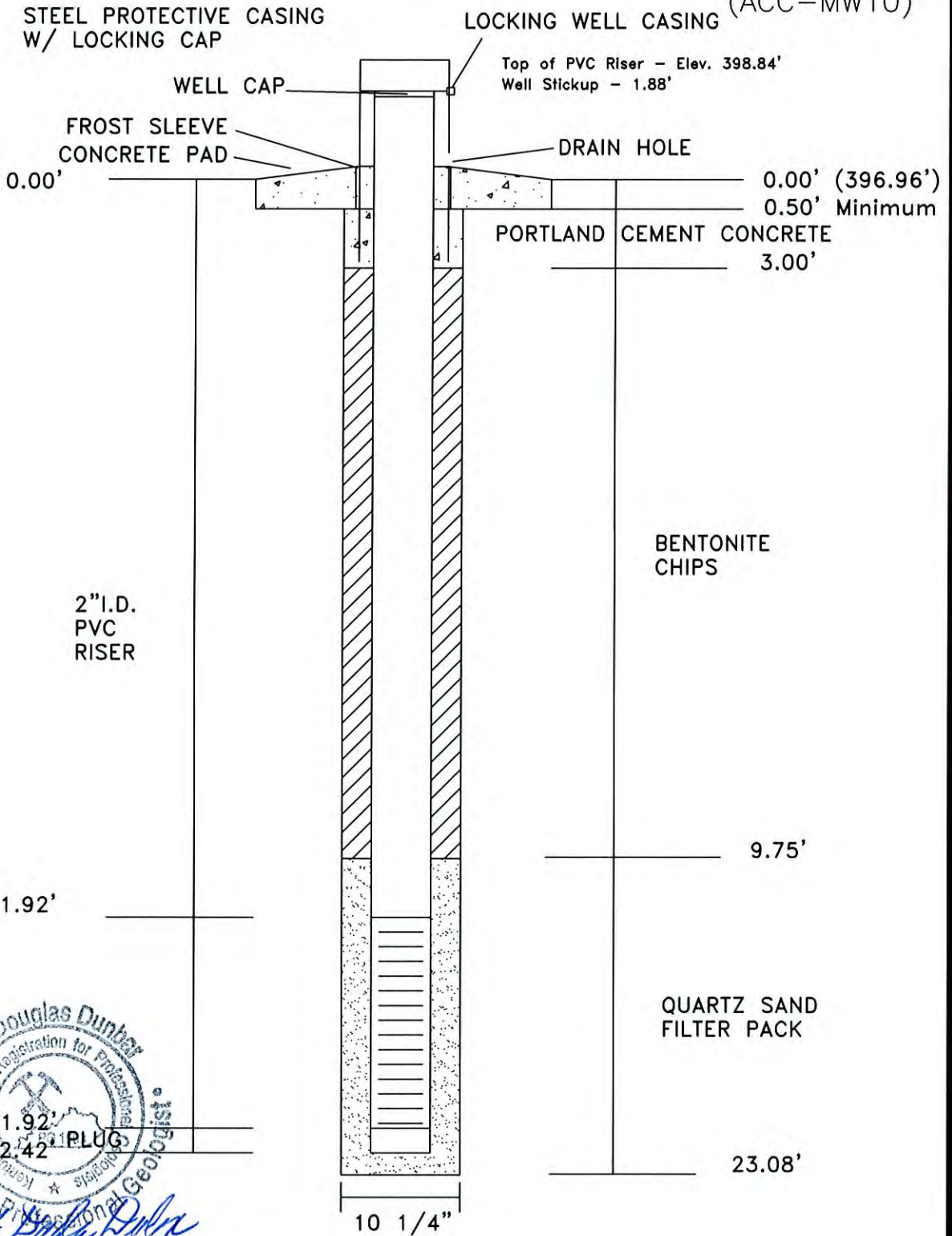
S. Duckworth



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UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable)																																											
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5. Owner address <b>P. O. Box 24</b>			2. Owner Well ID # <b>ACC-MW-10</b>																																												
6. City <b>Henderson</b>		7. State <b>KY</b>	8. Zip <b>42419-0024</b>		3. Attachments Required <input type="checkbox"/> 1. Site plan or sketch map <input type="checkbox"/> 2. Well location On topographic map, OR Obtained by GPS unit Conditionally Required <input type="checkbox"/> 3. Well diagram (monitoring well) <input type="checkbox"/> 4. Coliform analysis (if applicable) <input type="checkbox"/> 5. Signed variance (if applicable) Optional <input type="checkbox"/> 6. Other laboratory analysis report																																										
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18. USGS topo map <b>Equality</b>			22. Physiographic Region <input type="checkbox"/> Bluegrass <input type="checkbox"/> Ohio River Alluvium <input type="checkbox"/> E. Coal Field <input checked="" type="checkbox"/> W. Coal Field <input type="checkbox"/> Miss. Plateau <input type="checkbox"/> Jackson Purchase																																												
19. County <b>Ohio</b>		20. Surface elevation (ft) <b>396.96</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input checked="" type="checkbox"/> Survey <input type="checkbox"/> Prior well log																																											
23. Well Use <input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump <input type="checkbox"/> Domestic <input type="checkbox"/> HVAC <input type="checkbox"/> Industrial <input type="checkbox"/> Injection <input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining <input type="checkbox"/> Public <input type="checkbox"/> Unused		24. Drilling method <input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash <input type="checkbox"/> Auger - SS <input type="checkbox"/> Push/probe <input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air <input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse <input type="checkbox"/> Core <input type="checkbox"/> Sand point <input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic <input type="checkbox"/> Excavation <input type="checkbox"/> Unknown <input type="checkbox"/> Combined - HS auger & air rotary		25. Well status <input checked="" type="checkbox"/> Active <input type="checkbox"/> Inactive <input type="checkbox"/> Unsuitable for intended use 26. Wellhead <input type="checkbox"/> Flush <input checked="" type="checkbox"/> Locking <input type="checkbox"/> Well cap <input type="checkbox"/> Sanitary seal																																											
27. Well completion: Casing and screens <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>From depth, ft.</th> <th>To depth, ft.</th> <th>Borehole diameter</th> <th>Casing diameter</th> <th>Casing type</th> <th>Screen slot size</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>11.92</td> <td>10 1/4"</td> <td>2"ID</td> <td>PVC</td> <td></td> </tr> <tr> <td>11.92</td> <td>21.92</td> <td>10 1/4"</td> <td>2"ID</td> <td>PVC screen</td> <td>0.010</td> </tr> <tr> <td>21.92</td> <td>22.42</td> <td>10 1/4"</td> <td>2"ID</td> <td>PVC</td> <td></td> </tr> <tr> <td>22.42</td> <td>23.08</td> <td>10 1/4"</td> <td>2"ID</td> <td>Open hole</td> <td></td> </tr> </tbody> </table>			From depth, ft.	To depth, ft.	Borehole diameter	Casing diameter	Casing type	Screen slot size	0.00	11.92	10 1/4"	2"ID	PVC		11.92	21.92	10 1/4"	2"ID	PVC screen	0.010	21.92	22.42	10 1/4"	2"ID	PVC		22.42	23.08	10 1/4"	2"ID	Open hole		28. Annulus fill and seal <table border="1" style="width:100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>From depth, ft.</th> <th>To depth, ft.</th> <th>Material</th> </tr> </thead> <tbody> <tr> <td>0.00</td> <td>3.00</td> <td>Concrete</td> </tr> <tr> <td>3.00</td> <td>9.75</td> <td>Bentonite chips</td> </tr> <tr> <td>9.75</td> <td>23.08</td> <td>Sand</td> </tr> </tbody> </table>			From depth, ft.	To depth, ft.	Material	0.00	3.00	Concrete	3.00	9.75	Bentonite chips	9.75	23.08	Sand
From depth, ft.	To depth, ft.	Borehole diameter	Casing diameter	Casing type	Screen slot size																																										
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9.75	23.08	Sand																																													
29. Lithologic log (if more space is needed, continue on separate page) From depth, ft.   To depth, ft.   Description (include any show of water and indicate apparent quality) <b>0.00   23.08   Mine spoil - gray clay with gray shale and gray sandstone fragments. Wet at 12 ft.</b>			30. Sketch map <input checked="" type="checkbox"/> Site plan/sketch map attached on separate page <small>Show well location and distance from permanent structures, septic drain fields, major roads (include name or number) and intersections. INDICATE NORTH WITH AN ARROW.</small>																																												
49. Comments <b>6 1/4" HSA advanced to 28.08'. Sand placed 22.42 - 23.08'. 2" PVC screen and riser installed. Sand placed 9.75' - 22.42'. Bentonite chips 3.0' - 9.75'. Protective casing installed in concrete pad.</b>			41. Pitless adapter installed <input type="checkbox"/> Yes <input type="checkbox"/> No 42. Pump installed: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Turbine <input type="checkbox"/> Beller or bucket <input type="checkbox"/> Hand <input type="checkbox"/> No pump 43. Depth to intake (ft) _____ 44. Apparent quality and odor: APPEARANCE <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Muddy <input type="checkbox"/> Turbid ODOUR   none   slight   mod   high <input type="checkbox"/> Iron <input type="checkbox"/> Sulfur <input type="checkbox"/> Salt																																												
50. Affirmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note: the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.			35. Coliform test type <input type="checkbox"/> fecal <input type="checkbox"/> fecal and total 36. Coliform test results <input type="checkbox"/> 0 or <1.0 <input type="checkbox"/> TNTC <input type="checkbox"/> Confluent or _____ # colonies per 100 ml 37. Date Sampled _____ 38. Date Analyzed _____																																												
Signature of certified driller <b>Julie Johnson</b>		Date signed <b>4/9/09</b>		Date Received _____																																											
Certification number <b>0373-0255-01</b>		Drilling company <b>American Drilling Services</b>		Initials of reviewer _____																																											

MONITORING WELL 8005-3478  
(ACC-MW10)

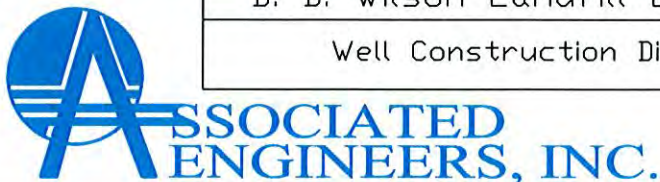


G. Douglas Dunbar  
Board of Registration for Professional Engineers  
Registered Professional Geologist  
21.92'  
22.42' PLUG  
*G. Douglas Dunbar*  
7-30-09

D. B. Wilson Landfill Expansion

Well Construction Diagram

Job Number:	080542	Revisions:
Date:	2-10-2009	S. Duckworth
Scale:	No Scale	
Drawn By:	D. Dunbar	

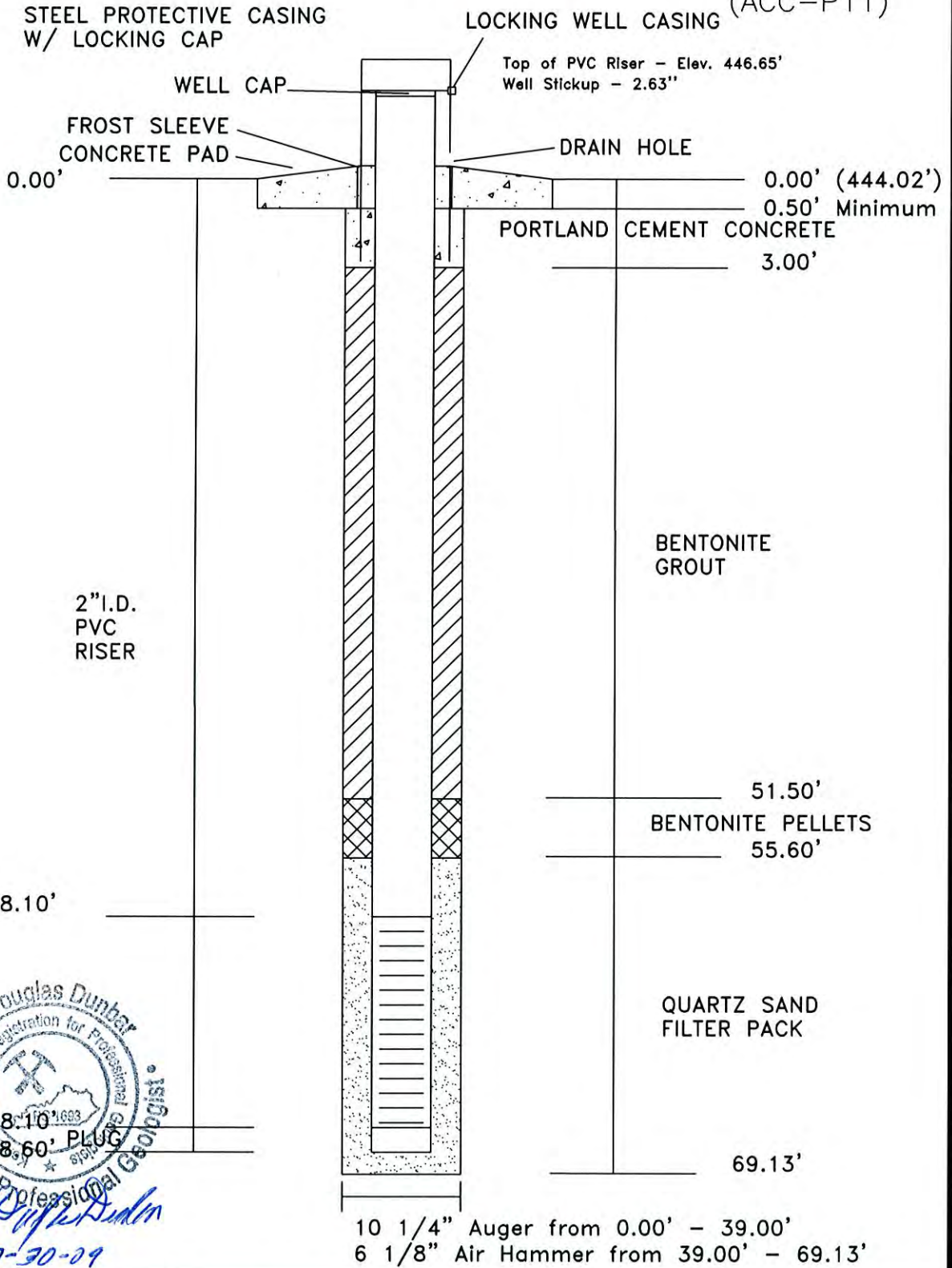


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UNIFORM KENTUCKY WELL CONSTRUCTION RECORD				Attach Well Identification Number Label Here (if applicable) Water wells: yellow labels Monitoring wells: blue labels	
Use this form to report installation of monitoring or water wells. Original copy must be submitted to Division of Water within 30 days of completion. See instructions on reverse of form. Do not write in shaded areas. Record must be typed or neatly printed or it will be returned to the driller as unacceptable. One copy to Division of Water, one copy to owner, one copy to driller's files.					
4. Owner name <b>Big Rivers Electric Corporation</b>			1. Kentucky Well ID (AKGWA) Number <b>8005 - 3472</b>		
5. Owner address <b>P. O. Box 24</b>			2. Owner Well ID # <b>ACC-P-11</b>		
6. City <b>Henderson</b>		7. State <b>KY</b>	8. Zip <b>42419-0024</b>		
If site name and address differ from owner name and address:					
9. Site name <b>D.B. Wilson Station</b>			3. Attachments Required		
10. Site address <b>Highway 85</b>			1. Site plan or sketch map <input type="checkbox"/>		
11. City <b>Centertown</b>		12. State <b>KY</b>	2. Well location On topographic map, QR <input checked="" type="checkbox"/> Obtained by GPS unit <input type="checkbox"/>		
14. Agency Interest (AI) Number <b>3319</b>		15. Facility type & ID Number <input type="checkbox"/> CERCLA <input type="checkbox"/> Solid Waste <input type="checkbox"/> Drinking Water <input type="checkbox"/> RCRA <input type="checkbox"/> UST <input type="checkbox"/> Site Assessment <b>Special Waste Landfill</b>		3. Well diagram (monitoring well) <input type="checkbox"/>	
16. Owner phone <b>(270) 844-6031</b>		17. Site phone <b>(270) 821-7343</b>		4. Coliform analysis (if applicable) <input type="checkbox"/>	
18. USGS topo map <b>Equality</b>		22. Physiographic Region <input type="checkbox"/> Bluegrass <input type="checkbox"/> Ohio River Alluvium <input type="checkbox"/> E. Coal Field <input checked="" type="checkbox"/> W. Coal Field <input type="checkbox"/> Miss. Plateau <input type="checkbox"/> Jackson Purchase		5. Signed variance (if applicable) <input type="checkbox"/>	
19. County <b>Ohio</b>		21. Elevation determined by <input type="checkbox"/> GPS <input type="checkbox"/> Map <input type="checkbox"/> Prior report <input checked="" type="checkbox"/> Survey <input type="checkbox"/> Prior well log		6. Other laboratory analysis report <input type="checkbox"/>	
20. Surface elevation (ft) <b>444.02</b>		23. Well Use <input type="checkbox"/> Agriculture <input type="checkbox"/> Geothermal <input type="checkbox"/> Commercial <input type="checkbox"/> Heat pump <input type="checkbox"/> Domestic <input type="checkbox"/> HVAC <input type="checkbox"/> Industrial <input type="checkbox"/> Injection <input checked="" type="checkbox"/> Monitoring / Remed <input type="checkbox"/> Mining <input type="checkbox"/> Public <input type="checkbox"/> Unused		31. Work start date <b>Jan 16 2009</b>	
		24. Drilling method <input checked="" type="checkbox"/> Auger - HS <input type="checkbox"/> Jet wash <input type="checkbox"/> Auger - SS <input type="checkbox"/> Push/probe <input type="checkbox"/> Auger - bucket <input type="checkbox"/> Rotary - air <input type="checkbox"/> Auger - hand <input type="checkbox"/> Rotary - mud <input type="checkbox"/> Cable tool <input type="checkbox"/> Rotary - reverse <input type="checkbox"/> Core <input type="checkbox"/> Sand point <input type="checkbox"/> Driven casing <input type="checkbox"/> Sonic <input type="checkbox"/> Excavation <input type="checkbox"/> Unknown <input type="checkbox"/> Combined - HS auger & air rotary		32. Work end date <b>Feb 12 2009</b>	
		25. Well status <input type="checkbox"/> Active <input checked="" type="checkbox"/> Inactive <input type="checkbox"/> Unsuitable for intended use		Please report depths in feet below surface, not as relative elevations	
		26. Wellhead <input type="checkbox"/> Flush <input type="checkbox"/> Locking <input type="checkbox"/> Well cap <input type="checkbox"/> Sanitary seal		33. Total depth (ft) <b>69.13</b>	
		27. Well completion: Casing and screens		34. Depth to bedrock (ft) _____	
		28. Annulus fill and seal		35. Static water level (ft) <b>57.10</b>	
		29. Lithologic log (if more space is needed, continue on separate page)		36. Casing height above surface (ft) <b>31.56</b>	
		30. Sketch map <input checked="" type="checkbox"/> Site plan/sketch map attached on separate page		<b>WATER WELLS ONLY</b>	
		49. Comments <b>6 1/4" HSA advanced to 39.0'. 6 1/8" air hammer 39.0' - 69.13'. Sand placed 68.8' - 69.13'. 2" PVC screen and riser installed. Sand placed 55.6' - 69.13'. Bentonite pellets 51.5' to 55.6'. Bentonite tremie grouted from 3.0' to 51.5'. Protective casing installed in concrete pad.</b>		37. Estimated well yield <input type="checkbox"/> gpm <input type="checkbox"/> gph <input type="checkbox"/> gpd	
		50. Affirmation: The work described above was done under my supervision, and this report is true and correct to the best of my knowledge. Note, the driller is not responsible for natural groundwater quality or quantity encountered while drilling or completing this well.		38. Well service # of people served _____	
Signature of certified driller <i>Steve Jones</i>		Date signed <b>4/9/09</b>		39. Disinfectant amount <input type="checkbox"/> oz <input type="checkbox"/> qts <input type="checkbox"/> cups <input type="checkbox"/> Hypo-chlorite	
Certification number <b>0373-0259-01</b>		Drilling company <b>American Drilling Services</b>		40. Type <input type="checkbox"/> Bleach <input type="checkbox"/> Iba <input type="checkbox"/> gal	
				41. Pitless adapter installed <input type="checkbox"/> Yes <input type="checkbox"/> No	
				42. Pump installed: <input type="checkbox"/> Submersible <input type="checkbox"/> Jet <input type="checkbox"/> Turbine <input type="checkbox"/> Baller or bucket <input type="checkbox"/> Hand <input type="checkbox"/> No pump	
				43. Depth to intake (ft) _____	
				44. Apparent quality and odor: APPEARANCE: <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Muddy <input type="checkbox"/> Turbid ODOR: none <input type="checkbox"/> slight <input type="checkbox"/> mod <input type="checkbox"/> strong <input type="checkbox"/> Iron <input type="checkbox"/> Sulfur <input type="checkbox"/> Salt	
				COLIFORM TEST 45. Coliform test type <input type="checkbox"/> fecal <input type="checkbox"/> fecal and total	
				46. Coliform test results <input type="checkbox"/> 0 or <1.0 <input type="checkbox"/> TNTC <input type="checkbox"/> Confluent or _____ # colonies per 100 ml	
				47. Date Sampled Day Year	
				48. Date Analyzed Month Day Year	
				Latitude DMS or Decimal	
				Longitude DMS or Decimal	
				1. a.u.t. log method <input type="checkbox"/> INT <input type="checkbox"/> GPS <input type="checkbox"/> SUR <input type="checkbox"/> REP	
				Date Received	
				Initials of reviewer	

MONITORING WELL 8005-3472  
(ACC-P11)



*G. Douglas Dunbar*  
 Board of Registration for Professional Geologists  
 Registered Professional Geologist  
 68-10-1693  
 68-60-PLUG  
*D. Duckworth*  
 7-30-09

D. B. Wilson Landfill Expansion

Job Number: 080542

Revisions:

Date: 2-10-2009

S. Duckworth

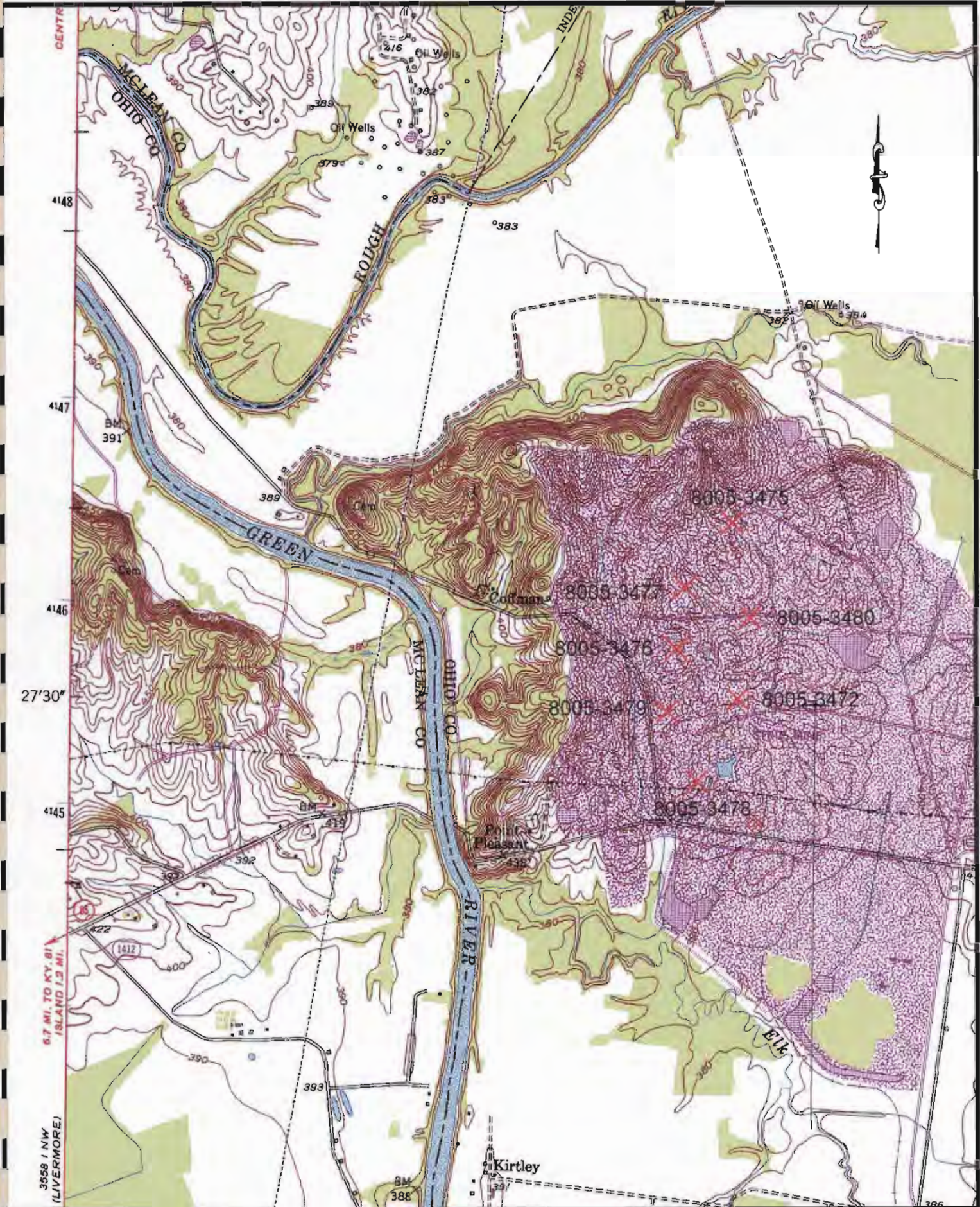
Well Construction Diagram

Scale: No Scale

Drawn By: D. Dunbar



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# Well Location Map

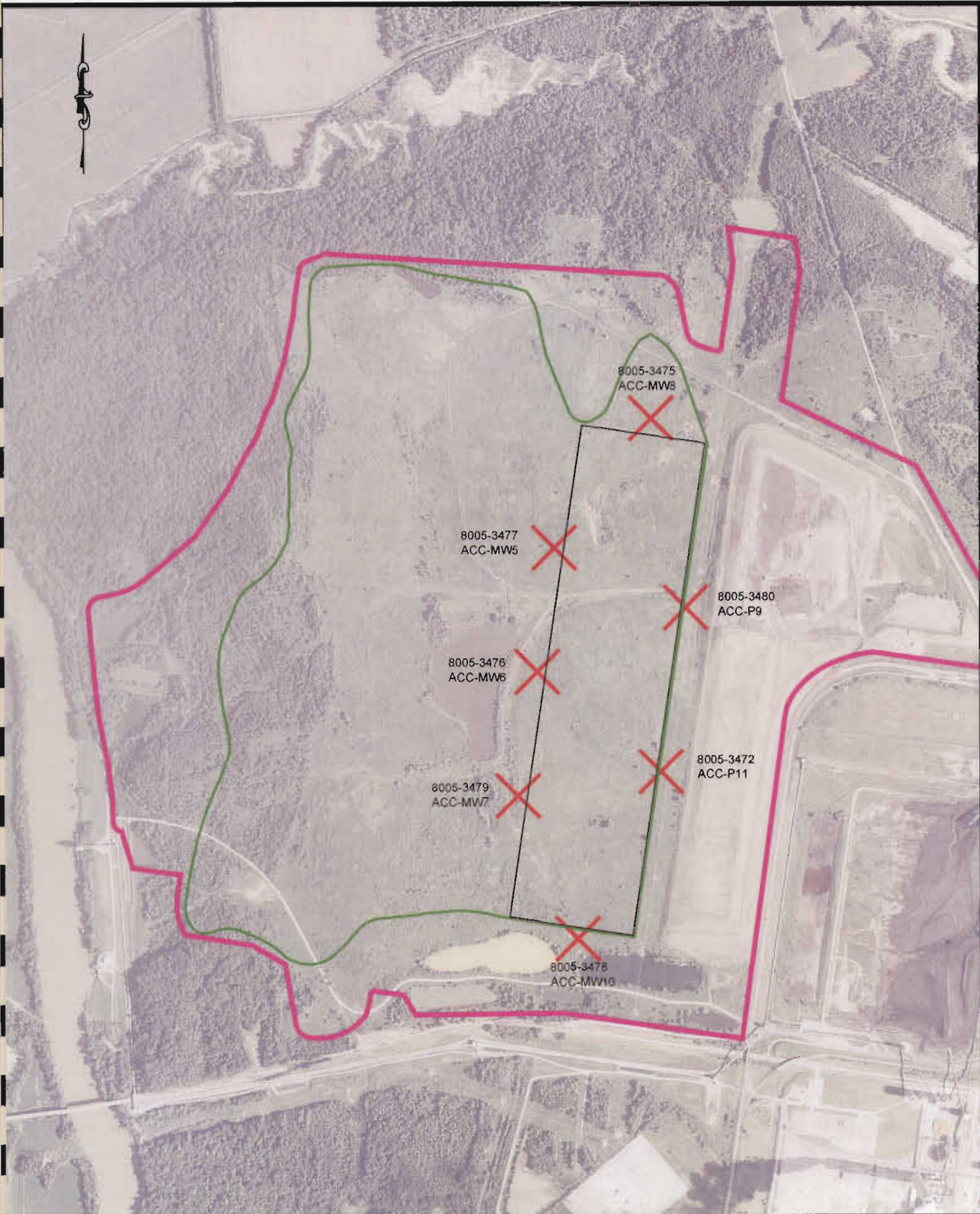
D.B. Wilson Landfill

Equality Quadrangle

Scale: 1" = 2000'



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# Site Plan

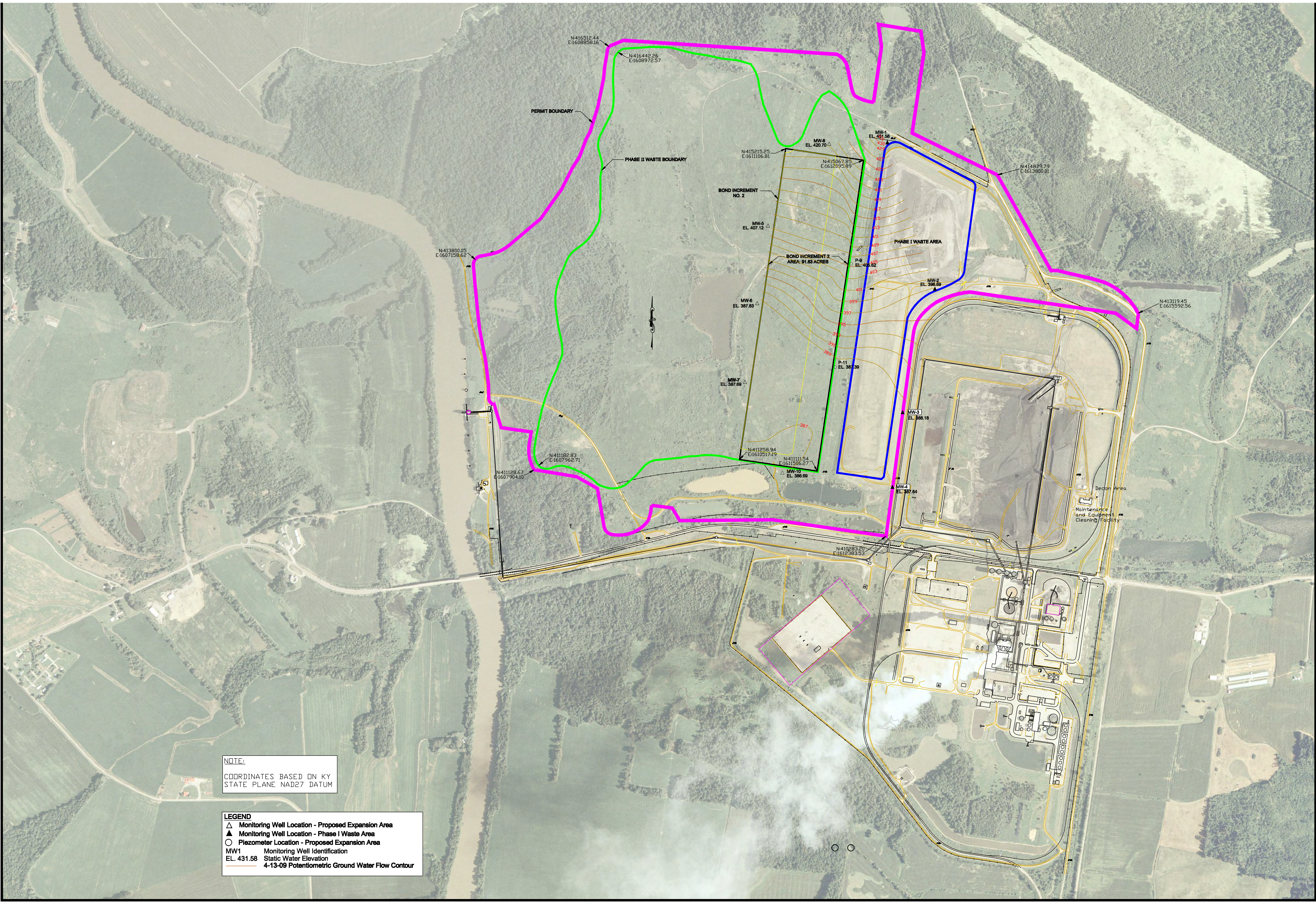
D.B. Wilson Landfill

Equality Quadrangle

SCALE: 1" = 1000'



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**NOTE:**  
 COORDINATES BASED ON KY  
 STATE PLANE NAD27 DATUM

**LEGEND**  
 ▲ Monitoring Well Location - Proposed Expansion Area  
 ▲ Monitoring Well Location - Phase I Waste Area  
 ○ Piezometer Location - Proposed Expansion Area  
 MW1 Monitoring Well Identification  
 EL. 431.58 Static Water Elevation  
 4-13-09 Potentiometric Ground Water Flow Contour

REVISIONS:	SMD 04-13-09
	SMD 09-09-09

JOB NUMBER	080542
DRAWN BY	AFJ
CHECKED BY	
DATE	11/19/08

WESTERN KENTUCKY ENERGY  
 D.B. WILSON STATION  
 SITE PLAN  
 2006 AERIAL PHOTOGRAPHS SCALE: 1" = 500'

## **Appendix B**

### **2019 Monitoring Well Construction Progress Report**

# MONITORING WELL CONSTRUCTION PROGRESS REPORT - ADDENDUM CCR MONITORING PROGRAM

## PHASE II LANDFILL D.B. WILSON GENERATING STATION OHIO COUNTY, KENTUCKY

December 13, 2019

*Prepared For:*



Big Rivers Electric Corporation  
D.B. Wilson Generating Station  
5663 State Route 85 West  
Centertown, KY 42328

*Prepared by:*

# AECOM

AECOM Technical Services

525 Vine Street  
Suite 1800  
Cincinnati, Ohio 45202  
Phone: (513) 651-3440  
Fax: (877) 660-7727

Job Number: 60619848

## TABLE OF CONTENTS

Section	Page
1.0 INTRODUCTION.....	1
2.0 FIELD ACTIVITIES .....	1
2.1 Staking and Utility Clearances .....	1
2.2 Monitoring Well Installation Schedule .....	1
2.3 Drilling and Logging Methods.....	1
2.4 Borehole Water Level Gauging .....	2
2.5 Borehole Abandonment .....	2
2.6 Monitoring Well Construction .....	2
2.7 Monitoring Well Development .....	3
2.8 Monitoring Well Survey .....	4
2.9 Equipment Decontamination .....	4
3.0 SUMMARY AND FINDINGS .....	5

### List of Figures

1. Monitoring Well Location Map
2. CCR Groundwater Monitoring System
3. Cross-Section A-A<sup>1</sup>
4. Cross-Section B-B<sup>1</sup>
5. Cross-Section C-C<sup>1</sup>

### List of Tables

1. Monitoring Well Network Groundwater Elevations

### List of Appendices

- A. Boring and Well Construction Logs
- B. Kentucky Well Records



## 1.0 INTRODUCTION

The United States Environmental Protection Agency (USEPA) released rules for the regulation, management, and disposal of coal combustion residuals (CCR) generated at electric utilities and independent power producers under the Resource Conservation and Recovery Act (RCRA) in the Federal Register on April 17, 2015 (CCR Rule). The federal CCR Rule (40 Code of Federal Regulations (CFR) Part 257(g) Subparts 1-5 requires that the owner or operator of a CCR unit install additional characterization of nature and extent is required after a Statistically Significant Increase (SSI) of App IV parameters is detected above Groundwater Protection Standards (GWPS). This Monitoring Well Construction Progress Report describes the procedures implemented on behalf of Big Rivers Electric Cooperation (BREC) to establish a network of monitoring wells to perform the requisite characterization groundwater monitoring well network for the D.B. Wilson Coal Combustion Residuals (CCR) Phase II Landfill (the Site).

A total of five wells (designated as MW-4D, MW-102, MW-104, MW-105, and MW-110) were originally planned to be installed at locations downgradient or cross gradient (MW-102) from the Wilson Phase II Landfill. The borings for the wells were drilled within mine spoils and bedrock (sandstone, shale), and finished as 2-inch monitoring wells.

This report documents field activity associated with monitoring well installation, construction, development, and surveying at the Site between October 4 and November 15, 2018. This report was initially submitted to the Kentucky Division of Waste Management (DWM) on June 25, 2019 but has been revised in this addendum to incorporate DWM comments on the original document.

## 2.0 FIELD ACTIVITIES

This section documents the field activities performed in completing the characterization groundwater monitoring network for the Phase II Landfill at the D.B. Wilson Station. A site map detailing the monitoring well locations is provided as **Figure 1**.

### 2.1 Staking and Utility Clearances

AECOM worked with BREC to establish a network of monitoring wells to conduct the requisite characterization groundwater sampling. Prior to the start of drilling, proposed locations were reviewed with BREC personnel during a field visit on October 4, 2018. Proposed locations were staked on October 4, 2018. BREC personnel provided final approval to relocate MW-104 north to avoid a fire suppression water line within the vicinity. Utility clearance surveys were performed at the original proposed locations and the approved alternate location of MW-104 on October 8, 2018 by Blood Hound, Inc. of Brownsburg, Indiana under subcontract to AECOM.

All monitoring well locations were cleared using a hand auger to a minimum of 5 feet below ground surface (bgs) prior to the advancement of powered drill tooling to help avoid potential damage of underground utilities.

### 2.2 Monitoring Well Installation Schedule

Drilling and well construction services were performed by Cascade Drilling, LP (Cascade) of Marietta, Ohio, under subcontract to AECOM. The Kentucky Certified Well Driller for the project was Todd Mills of Chase Environmental Group (Chase) of Kevil, KY under subcontract to Cascade.

The following is a general timeline of drilling and well construction activities:

October 9	Set-up staging area and decontamination pad
October 9 - October 13	Drill borings and set monitoring wells
October 15 - October 17	Complete surface completions and perform well development activities
October 17	Complete well installations
October 17	Monitoring well coordinate/elevation survey

### 2.3 Drilling and Logging Methods

The installation and development of new monitoring wells was completed to meet the groundwater monitoring requirements of EPA's CCR Rule (40 CFR Part 257) and Title 401 of Kentucky Administrative Regulations (KAR) Chapter 45:160. Drilling and installation of the CCR Rule monitoring wells at the Site was performed under the supervision of a Kentucky Certified Well Driller, (Mr. Todd Mills of Chase, License #0344045400).

Boreholes were advanced by rotosonic drilling methods with an annular diameter of 6-inches to provide a nominal 4-inch annular space required between the borehole and the well casing. Samples of unconsolidated materials were collected at a minimum 5-foot interval via rotosonic sampler in order to classify the physical characteristics of the unsaturated and saturated zones. The lithologic characteristics observed by the field geologist are presented in the boring logs (**Appendix A**).

Boreholes were advanced to sufficient depth to allow installation of monitoring wells within the uppermost groundwater zone, either within bedrock or unconsolidated deposits (MW-102). MW-4D was advanced

through the mine spoils below the uppermost groundwater zone and set at the mines spoil/bedrock interface to assess the groundwater impacts to the bedrock underlying the spoil materials.

## 2.4 Borehole Water Level Gauging

During drilling, the geologist kept observations of when water would appear in the lithologic samples. Periodically, drilling operations would be paused to allow recharge (inflow of groundwater) to be evaluated. The depths of the wells were selected based on the following factors: observable water, rocks with primary porosity, water bearing zones within rock core (weathered zones, fracture seams, etc.), and the target elevation in reference to the baseline monitoring well network total depth and water level elevation.

## 2.5 Borehole Abandonment

During well installation efforts at proposed location MW-110, the initial borehole was advanced beyond the targeted completion depth to identify the reference elevation of the No. 9 coal seam to assist in determining the total depth. This information was used to inform the conceptual site model and to identify a target depth for MW-4D. The initial borehole was abandoned in accordance with KAR 401 6:350 by a licensed driller. An offset boring was drilled for installation of monitoring well MW-110.

## 2.6 Monitoring Well Construction

The installation and development of the characterization monitoring wells is intended to meet the groundwater monitoring requirements of EPA's CCR Rule (40 CFR Part 257). Five 2-inch inner diameter (ID) polyvinyl chloride (PVC) monitoring wells with 10-foot screen intervals (0.010 slot) were installed during October of 2018. Well construction details are provided in the table below and are included on the boring logs provided in **Appendix A**.

Well ID	Location	Installation Date	Well Depth feet (btoc)	Well Casing Diameter (inch)	Borehole Diameter (inch)
MW-102	Wilson Phase II Landfill (East)	10/13/2018	39.25	2	6
MW-104	Wilson Phase II Landfill (Southeast)	10/9/2018	63.31	2	6
MW-105	Wilson Phase II Landfill (Southwest)	10/12/2018	96.36	2	6
MW-110	Wilson Phase II Landfill (South)	10/11/2018	42.76	2	6
MW-4D	Wilson Phase II Landfill (Southeast)	10/13/2018	43.43	2	6

btoc = below top of casing

Well construction was initiated after the borehole was advanced to the desired total depth. A 2-inch ID schedule 40 PVC well pipe and riser was positioned at the appropriate depth within the open borehole. A deviation from the standard 4-inch ID riser and screen required under 401 KAR 45:160 was outlined in a letter from BREC to KDEP dated August 21, 2018 and approved by KDEP in a letter dated October 5, 2018. Once in position, #5 sand filter pack material consisting of clean, rounded to well-rounded, insoluble particles of quartz silica composition was placed around the well screen to within a minimum of 2 feet above the top of the 10-foot screened interval. MW-105 is an exception to this standard in that it was constructed with a sand filter pack that extends 23 feet above the top of the screened interval. This deviation from the standard well construction procedure was used because there was no clear indication of the likely groundwater production zone at the time of drilling. Evaluation of the post-construction groundwater levels reveals that the static groundwater elevation measured in MW-105 (390.08 feet amsl in December 2018) is 46.58 feet above the top of the screened interval (343.5 feet amsl) and very near to the ground surface.

It appears that the monitoring well may be getting recharge from a minor fracture horizon noted at 27.5 feet bgs in the boring log (see **Appendix A**) and that a more appropriate screened interval would be at 333.5 to 343.5 feet amsl. There is no evidence that there are deeper water-bearing horizons intercepted by the screen/sand pack, so there does not appear to be a potential for cross-contamination. Regardless, abandonment and replacement of this well will be addressed in the data gap stage of the Selection of Remedy CCR activities.

Following placement of the sand filter pack at each monitoring well locations, a minimum 2-foot-thick interval of bentonite pellets was placed above the sand filter pack and hydrated to manufacturer recommendations to form the bentonite well seal. The borehole annulus above the bentonite seal was filled with bentonite grout slurry, to a height approximately 2 feet bgs. Deionized water, obtained locally from the D.B. Wilson Station, was utilized as the hydration fluid for the bentonite seal and grout slurry.

The new monitoring wells were completed above ground surface as detailed below.

Well ID	Location	Installation Date	Top of Casing Elevation	Ground Surface Elevation	Stick-up Height (feet)
MW-102	Wilson Phase II Landfill (East)	10/13/2018	399.71	396.46	3.25
MW-104	Wilson Phase II Landfill (Southeast)	10/9/2018	392.87	389.76	3.11
MW-105	Wilson Phase II Landfill (Southwest)	10/12/2018	396.74	393.56	3.18
MW-110	Wilson Phase II Landfill (South)	10/11/2018	393.54	390.56	2.98
MW-4D	Wilson Phase II Landfill (Southeast)	10/13/2018	410.02	407.03	2.99

Each monitoring well was equipped with a locking steel casing, 4 by 4 foot concrete pad at a sufficient depth to protect against frost heave, and four surrounding bollard posts to protect against vehicle strikes in accordance with 401 Kentucky Administrative Regulations (KAR) 45:160 Section 3(4). The protective steel casings and bollard posts were painted with a high visibility paint designed to inhibit corrosion.

Upon completion of well installation, the drilling subcontractor gauged each new monitoring well and submitted Kentucky Monitoring Well Records (DEP 8043) to the Kentucky Environmental and Public Protection Cabinet, Division of Water (KEPPC/DOW), Groundwater Branch. Copies of the Kentucky well records are provided as **Appendix B**.

## 2.7 Monitoring Well Development

Sufficient well development was critical to consistently achieving the low turbidity required for samples analyzed for total metals. Water within the well column was agitated (surged) by the raising and lowering of a Proactive Hurricane® submersible pump to help develop the well.

Well development was completed between October 15, 2018 and October 17, 2018. Development activities were continued until one of the following conditions was met:

- 1) a minimum of five times the volume of water lost to the formation during drilling was removed;
- 2) a minimum of five well volumes of groundwater was removed, calculated on the measured depth-to-water and total depth of the well at the time of development, or
- 3) until the water, being pumped from the well, was observed to be free of visible sediment.

Purge water resulting from development was containerized in a 200-gallon polyethylene container and later discharged to the ground surface.

## 2.8 Monitoring Well Survey

After all new wells were completed; the locations and elevations of all wells in the groundwater-monitoring network for the CCR Unit were surveyed on November 15, 2018 by James D. Cansler, a Kentucky-licensed Professional Surveyor with Associated Engineers, Inc. The elevation of the top of the inside (PVC) casing (north side) and ground surface were surveyed. Horizontal coordinates were established using the Kentucky State Plane Coordinate System, NAD 83, North Zone. Vertical elevation was measured to within +/- 0.01 ft. above mean sea level (amsl).

Well ID	AKGWA Number	Well Diameter (inch)	Northing	Easting	Top Of Casing (feet)	Total Depth (feet)	Screen Interval (feet)
MW-102	8007-2995	2	413379.918	1615236.077	399.71	36	26-36
MW-104	8007-2994	2	409906.937	1613180.209	392.87	40	30-40
MW-105	8007-2992	2	409924.745	1608904.522	396.74	50	50-60
MW-110	8007-2996	2	410067.232	1610839.037	393.54	40	30-40
MW-4D	8007-4811	2	410815.652	1612469.027	410.02	93	83-93

## 2.9 Equipment Decontamination

All downhole drilling equipment was decontaminated by the subcontractor prior to arrival at the station and on site at a designated decontamination pad before initiation of each boring. Between boreholes the downhole tooling was decontaminated with pressurized potable water to remove residual soil cuttings prior to use at the next borehole. All other equipment (pumps, water level indicators, etc.) was decontaminated using potable water and a mild laboratory-grade detergent (Alconox®) solution between holes.

### 3.0 SUMMARY AND FINDINGS

A total of five borings were advanced at the Site during October 9, 2018 and October 17, 2018 in order to install the characterization groundwater-monitoring network. The new monitoring wells, located at projected downgradient positions east, southeast, south, and southwest of the Wilson Phase II Landfill, will 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.

Groundwater level data collected during the 2018 monitoring events are summarized on **Table 1**. These data were used to construct a piezometric surface map to illustrate groundwater flow conditions for the uppermost aquifer (see **Figure 2**, December 2018). Overall groundwater flow beneath the footprint of the Wilson Phase II Landfill is to the south and southeast. Groundwater flow beneath the Landfill is influenced by extensive strip-mining and the physical extent of mine spoil deposits. These mine spoil deposits are laterally limited by the remaining bedrock high-walls left undisturbed along the north side of State Route 85 and beyond the western edge of the Wilson Phase II Landfill.

The Site lies in the Western Kentucky Coalfields section, characterized by rolling uplands underlain by coal-bearing bedrock of the Pennsylvanian Period. In the vicinity of the site, maximum topographic relief is on the order of 80 feet. The geologic quadrangle (Geologic map of the Equality quadrangle, Ohio County, Kentucky, 1973) for the Site vicinity published by the Kentucky Geological Survey (KGS) shows the surficial material to be unconsolidated loess representing the Pleistocene and Holocene geologic epoch. The loess consists of sandy and clayey silt. The unconsolidated surficial materials, which include silty and sandy clay units, are up to approximately 25 feet in thickness.

The unconsolidated materials are shown to be underlain by bedrock of the Middle Pennsylvanian Carbondale Formation. The Carbondale Formation consists of cyclic sequences of sandstones, shales, siltstones and coals. The Carbondale sediments were deposited in a fluvial-deltaic system. As a result of 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 prepared as part of development of the Assessment of Corrective Measures for the Site. The individual cross sections are presented on **Figures 3, 4 and 5**. These sections illustrate the sequence of geologic materials present under the Phase II Landfill as evidenced by the currently available data.

For purposes of compliance with the CCR Rule groundwater monitoring requirements the unconsolidated mine spoil is considered to be the uppermost aquifer underlying the Phase II Landfill. The uppermost usable aquifer is unconfined and first encountered at an elevation of approximately 400 ft. above mean seal level (amsl) at the north end of the Phase II Landfill and 395 ft. amsl at the south end.

Due to the nature of the Wilson Phase II Landfill site setting (former mining area with large minespoils deposit), many CCR parameters are expected to be naturally occurring in the uppermost aquifer. BREC will evaluate whether Alternative Source Demonstrations for SSIs and SSLs at Wilson Phase II Landfill is warranted.

## Figures



**Legend**

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



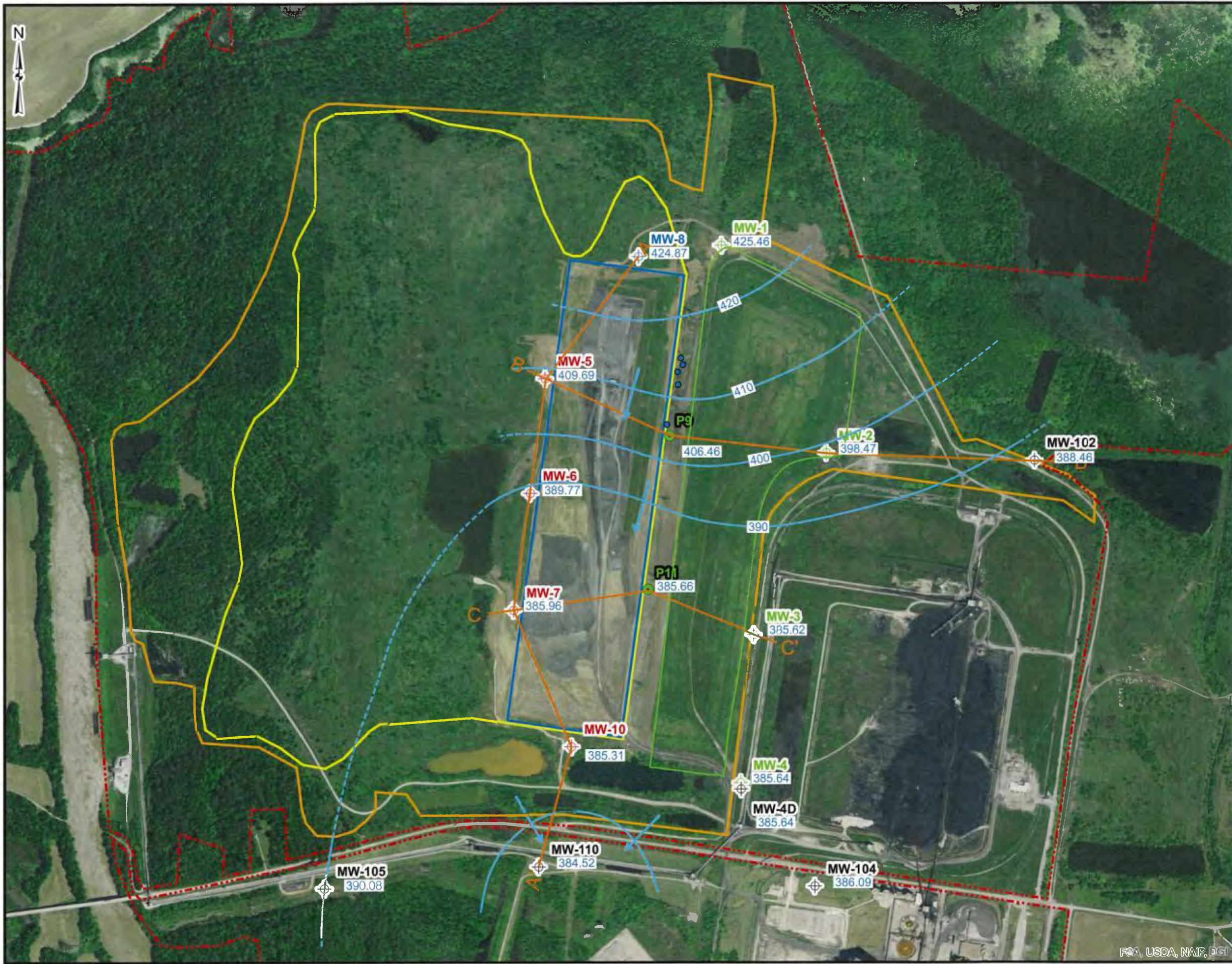
0 750 1,500  
Feet

Wilson Station Landfill  
Ohio County, Kentucky

FIGURE 1  
MONITORING WELL  
LOCATION MAP

DATE: 12/9/2019	SCALE: 1IN = 750 FEET
CREATED BY: ALW	
JOB NO. 60579935	



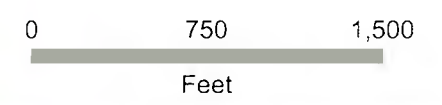


**Legend**

- Property Boundary
- CCR Phase 2 Landfill Permitted Area
- CCR Phase 2 Landfill (Active)
- KAR Permit Area
- CCR Phase 1 Landfill
- ⊕ Downgradient CCR Monitoring Well Location
- ⊕ Upgradient CCR Monitoring Well Location
- ⊕ Characterization Monitoring Well Location
- ⊕ Piezometer Location (Water Level Only)
- ⊕ Monitoring Well Location (Water Level Only)
- ⊙ Seep
- Water Table Contour (Inferred from Available Monitoring Data)
- Groundwater Flow Direction
- Groundwater Elevation (Feet, NAD27) Measured December 11, 2018



A ——— A'  
Transect Line



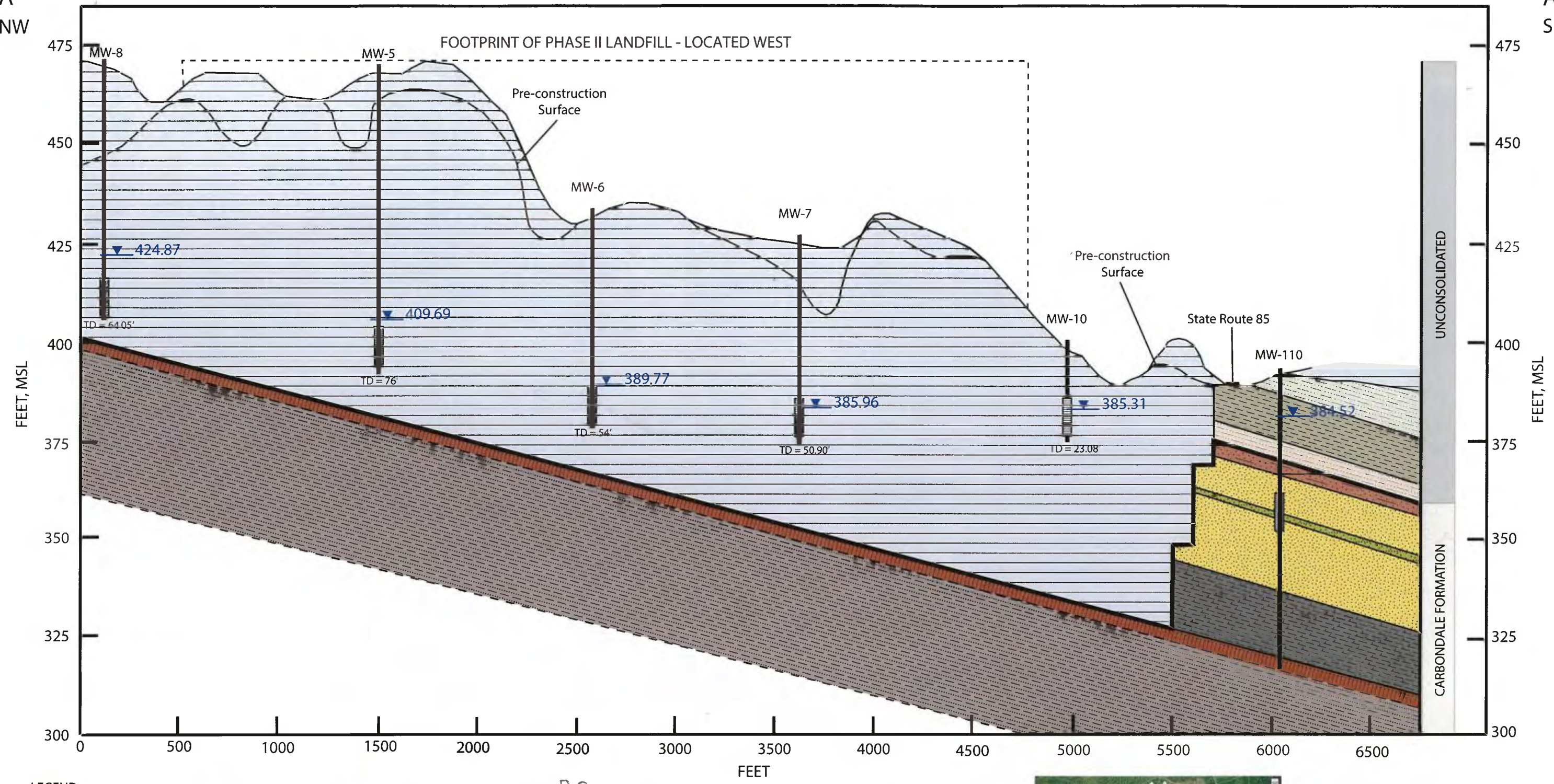
Wilson Station Landfill  
Ohio County, Kentucky

FIGURE 2  
CCR GROUNDWATER  
MONITORING SYSTEM

DATE: 5/16/2019	SCALE: 1IN = 750 FEET
CREATED BY: ALW	
JOB NO. 60579935	

A  
NW

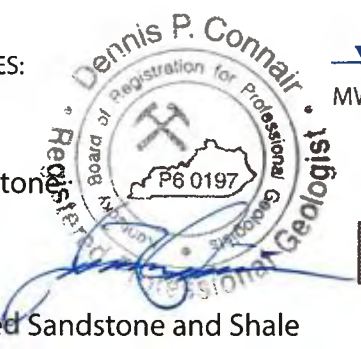
A'  
SE



LEGEND

- UNCONSOLIDATED MATERIALS:
- Mine Spoils
  - Silty Clay
  - Clayey Silt
  - Sandy Silty Clay
  - Clayey Sand
  - Underclay

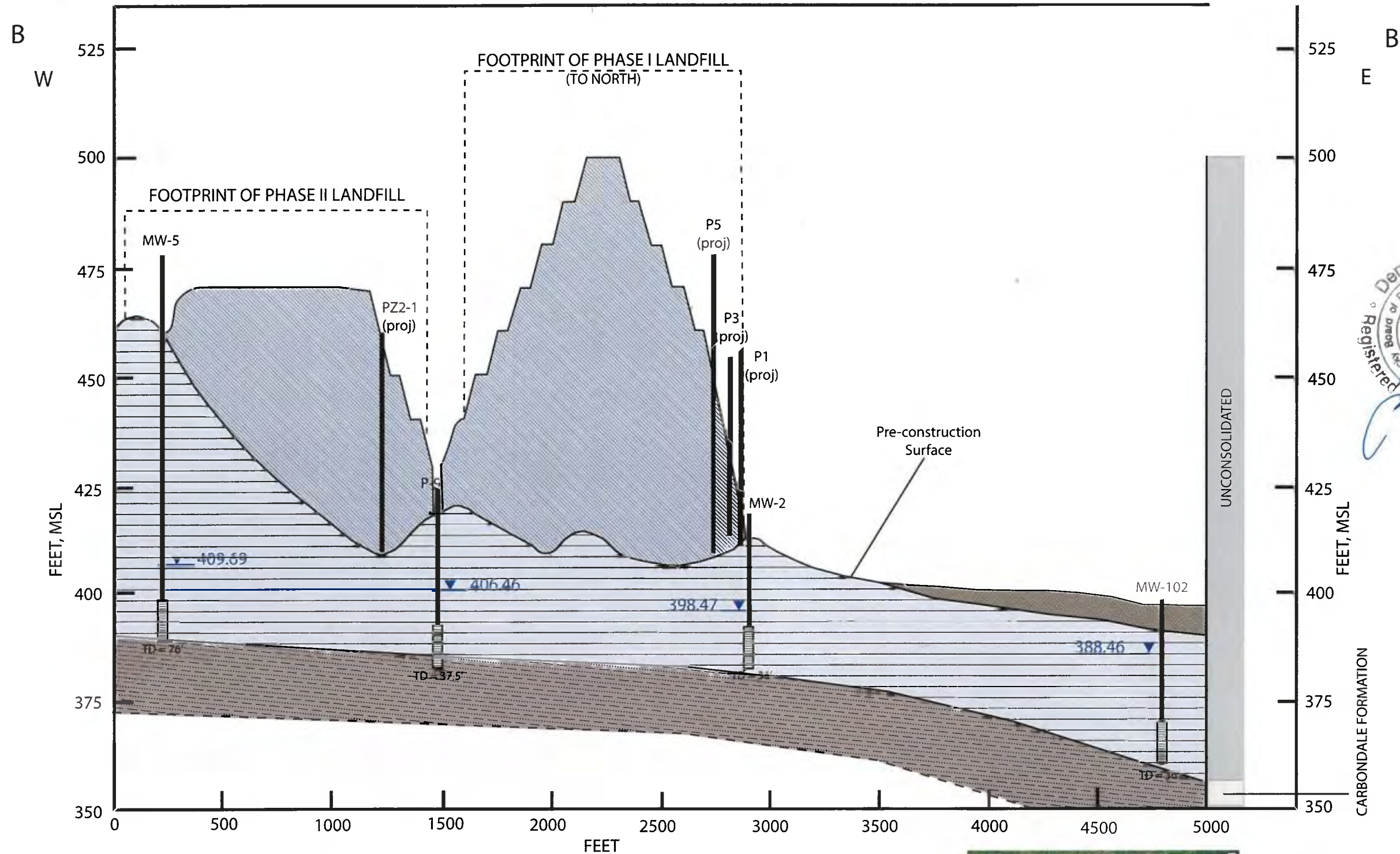
- BEDROCK LITHOLOGIES:
- Sandstone
  - Silty Sandstone
  - Shale
  - Interbedded Sandstone and Shale



- ▲ Potentiometric Surface December 11, 2018
  - MW-8 MONITORING WELL LOCATION ID
  - RISER
  - ▭ MONITORING WELL SCREEN
  - ▭ BACKFILL / COLLAPSE
- 25 feet  
500 feet  
(Vertical Exaggeration = 20x)

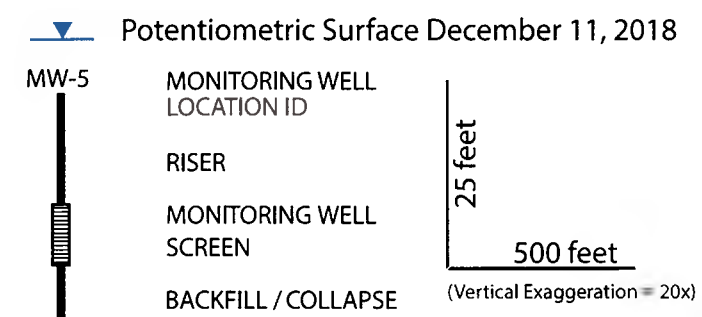


		Wilson Station Landfill Ohio County, Kentucky	
<b>FIGURE 3</b> <b>CROSS-SECTION A-A1</b>			
DATE: 5/17/2019	SCALE: 1 IN = 25 x 500 FEET		
CREATED BY: MRH			
JOB NO. 60579935			

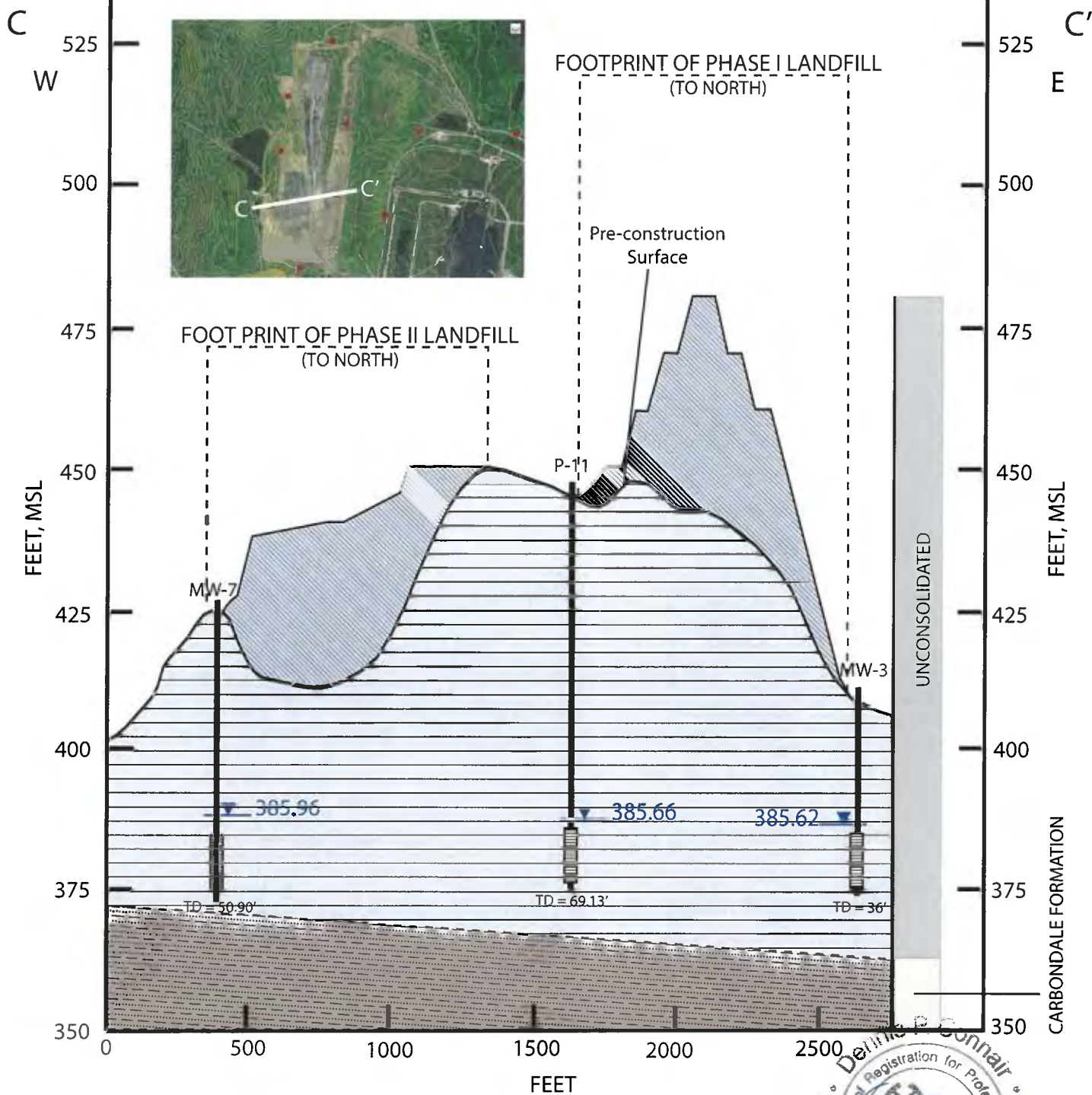


**LEGEND**

- UNCONSOLIDATED MATERIALS:**
- CCR Material
  - Mine Spoils
  - Fill
- BEDROCK LITHOLOGIES:**
- Interbedded Sandstone and Shale



		Wilson Station Landfill Ohio County, Kentucky	
<b>FIGURE 4</b> CROSS-SECTION B-B1			
DATE: 5/17/2019	SCALE: 1 IN = 25 x 500 FEET		
CREATED BY: MRH			
JOB NO. 60579935			



**LEGEND**

UNCONSOLIDATED MATERIALS: Potentiometric Surface December 11, 2018

- CCR Materials
- Mine Spoils
- MW-7 MONITORING WELL LOCATION ID
- RISER
- MONITORING WELL SCREEN
- BACKFILL / COLLAPSE

**BEDROCK LITHOLOGIES:**

- Interbedded Sandstone and Shale

25 feet  
500 feet  
(Vertical Exaggeration = 20x)



Wilson Station Landfill / Ohio County, Kentucky	
<b>FIGURE 5</b> CROSS-SECTION C-C1	
DATE: 5/17/2019	SCALE: 1 IN = 25 x 500 FEET
CREATED BY: MRH	
JOB NO. 60579935	

## Table

**TABLE 1**  
**MONITORING WELL NETWORK GROUNDWATER ELEVATIONS**  
**WILSON PHASE II CCR LANDFILL**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

<b>WILSON PHASE II CCR LANDFILL</b>										
<b>PROGRAM GROUNDWATER MONITORING WELL</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-5</b>		<b>MW-6</b>		<b>MW-7</b>		<b>MW-8</b>		<b>MW-10</b>	
	<b>Downgradient 469.14</b>		<b>Downgradient 433.06</b>		<b>Downgradient 426.14</b>		<b>Upgradient/Background 471.60</b>		<b>Downgradient 398.91</b>	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
4/13/2018	56.30	412.84	41.32	391.74	39.38	386.76	44.54	427.06	13.21	385.70
7/12/2018	57.56	411.58	42.60	390.46	39.93	386.21	44.45	427.15	13.39	385.52
10/3/2018	59.89	409.25	43.54	389.52	40.28	385.86	46.94	424.66	13.66	385.25
12/11/2018	59.45	409.69	43.29	389.77	40.18	385.96	46.73	424.87	13.60	385.31

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky June 2015  
 Survey coordinates were based on the Kentucky State Plane, Kentucky Southern Zone, NAD27 datum

<b>CHARACTERIZATION GROUNDWATER MONITORING WELL</b>										
<b>Reference Elevation TOIC*(ft, NAD27)</b>	<b>MW-4D</b>		<b>MW-102</b>		<b>MW-104</b>		<b>MW-105</b>		<b>MW-110</b>	
	<b>Characterization 410.02</b>		<b>Characterization 399.71</b>		<b>Characterization 392.87</b>		<b>Characterization 396.74</b>		<b>Characterization 393.54</b>	
<b>Date Measured</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>	<b>Depth to Water (ft) (feet)</b>	<b>GW Elevation (feet)</b>
11/2/2018	23.62	386.40	11.15	388.56	6.70	386.17	6.57	390.17	9.48	384.06
12/11/2018	24.38	385.64	11.25	388.46	6.78	386.09	6.66	390.08	9.02	384.52

Reference elevation of monitoring wells surveyed by Associated Engineers, Inc., Madisonville, Kentucky November 2018  
 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 1 (continued)**  
**GROUNDWATER ELEVATIONS**  
**SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS**  
**BIG RIVERS ELECTRIC CORPORATION - WILSON STATION**  
**OHIO COUNTY, KENTUCKY**

Reference Elevation TOIC*(ft, NAD27)	SUPPLEMENTAL WATER LEVEL ONLY MONITORING POINTS								PEIZOMETERS			
	MW-1		MW-2		MW-3		MW-4		North (P9)		South (P11)	
	Water Level Only 443.89		Water Level Only 417.11		Water Level Only 411.12		Water Level Only 408.82		Water Level Only 432.37		Water Level Only 446.55	
Date Measured	Depth to Water (ft)	GW Elevation (feet)	Depth to Water (ft)	GW Elevation (feet)	Depth to Water (ft)	GW Elevation (feet)	Depth to Water (ft)	GW Elevation (feet)	Depth to Water (ft)	GW Elevation (feet)	Depth to Water (ft)	GW Elevation (feet)
4/13/2018	18.02	425.87	17.05	400.06	24.39	386.73	23.58	385.24	25.81	406.56	60.15	386.40
7/12/2018	19.03	424.86	18.76	398.35	25.02	386.10	23.36	385.46	NM	NM	NM	NM
10/3/2018	18.86	425.03	19.34	397.77	25.03	386.09	23.40	385.42	25.95	406.42	60.89	385.66
12/11/2018	18.43	425.46	18.64	398.47	25.50	385.62	23.18	385.64	25.91	406.46	60.89	385.66

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

**Appendix A**  
**Boring and Well Construction Logs**

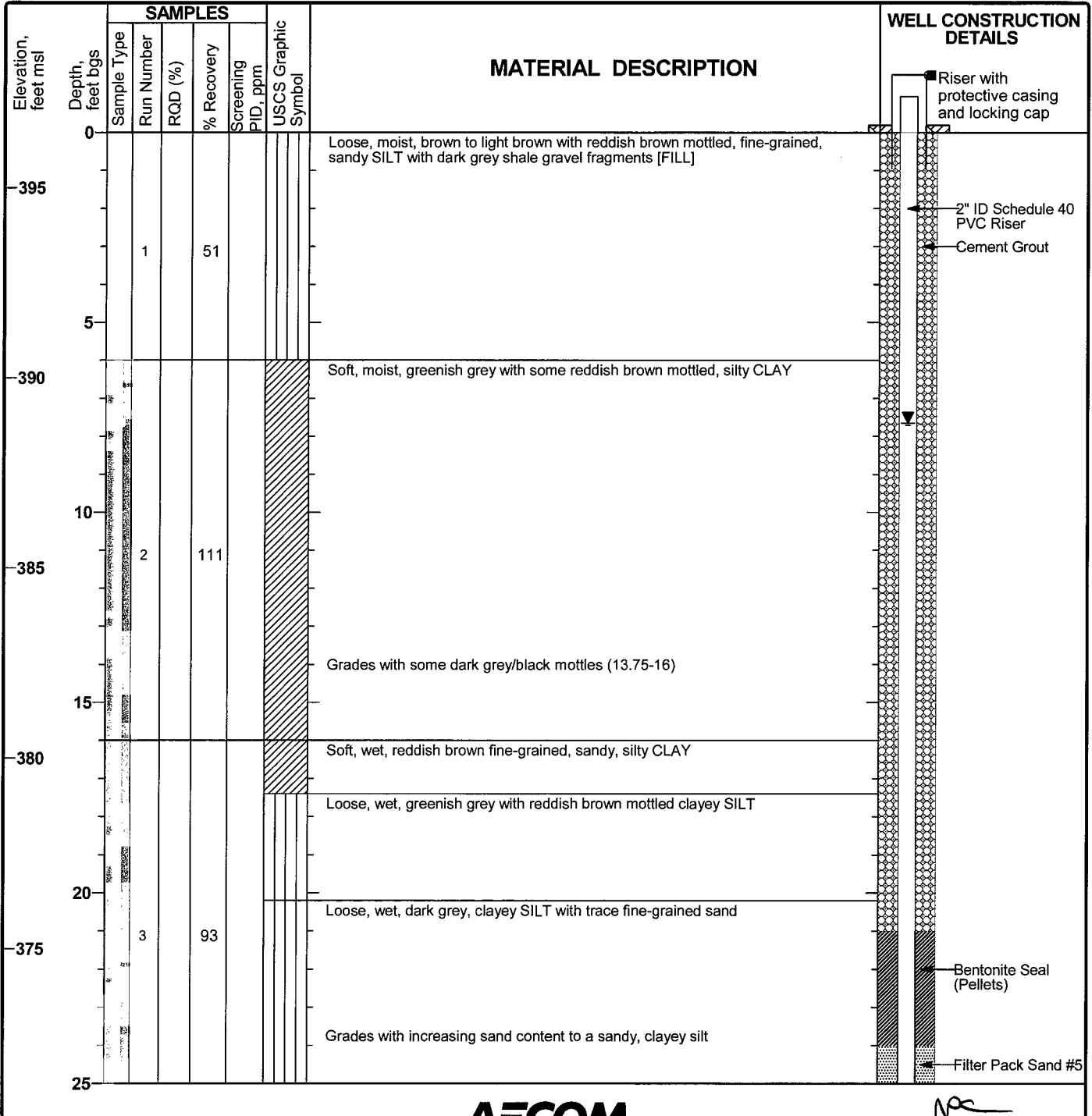


Client: **Big River Electric Co.**  
 Project: **DB Wilson Station**  
 Site: **Centertown, KY**  
 Project Number: **60589938**

**MW-102**

Sheet 1 of 2

Date(s) Drilled and Installed	10/13/18	Logged By	S. Lillard	Reviewed By	M. Wagner
Drilling Method	Rotosonic	Drilling Contractor	Cascade	Total Depth of Borehole	36.0 feet
Sampling Method	4" Sonic Sampler	Water Level	7.65 b.g.s. (measured 10/15/18)	Top of Casing Elevation	399.71 feet msl
Size and Type of Well Casing	2" PVC Schedule 40	Screen Perforation	0.010 inch slotted	Ground Surface Elevation	396.46 feet msl
Seal or Backfill	Bentonite/Cement Grout	Coordinates	N 413,379.92 E 1,615,236.08	AKGWA #	8007-2995



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19

*[Handwritten signature]*

Client: Big River Electric Co.

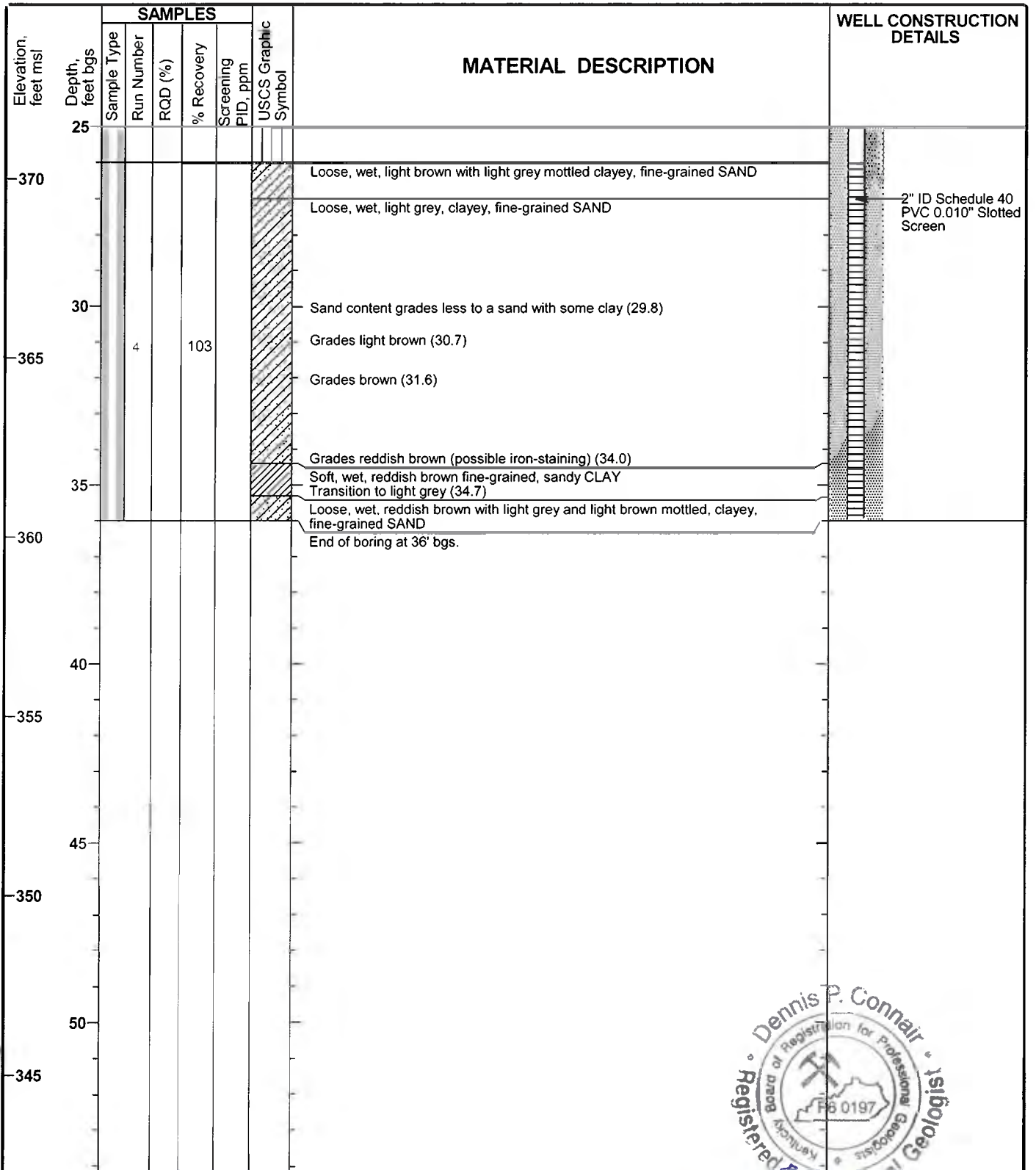
Project: DB Wilson Station

Site: Centertown, KY

Project Number: 60589938

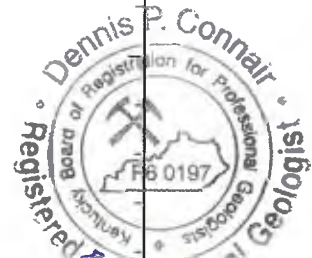
MW-102

Sheet 2 of 2



BREC MW INSTALL 2018 BR DBIW\_OCT18 MW INSTALL.GPJ 6/19/19

AECOM



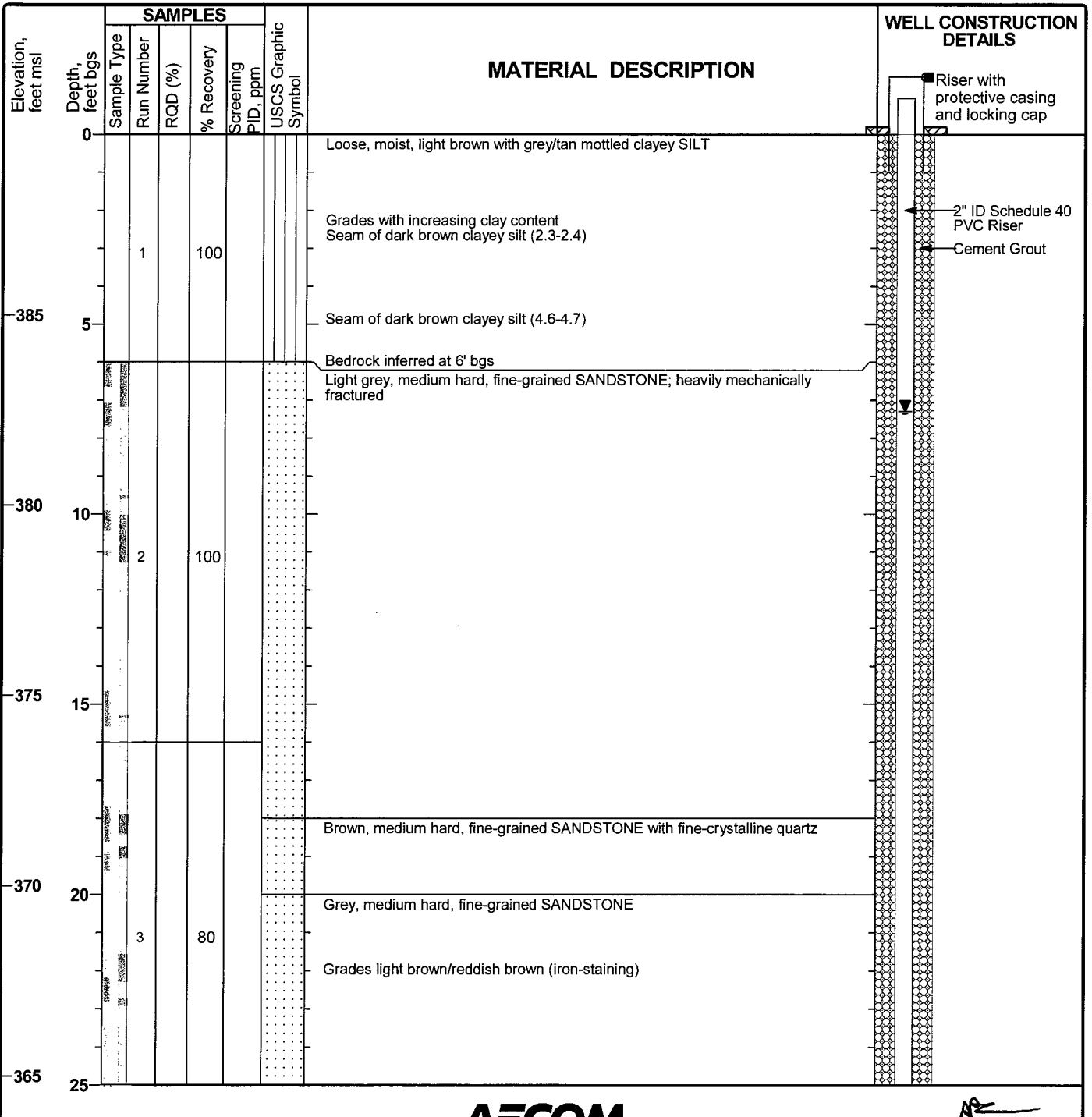
*Dennis P. Connair*

Client: **Big River Electric Co.**  
 Project: **DB Wilson Station**  
 Site: **Centertown, KY**  
 Project Number: **60589938**

**MW-104**

Sheet 1 of 2

Date(s) Drilled and Installed	10/9/18	Logged By	S. Lillard	Reviewed By	M. Wagner
Drilling Method	Rotosonic	Drilling Contractor	Cascade	Total Depth of Borehole	40.0 feet
Sampling Method	4" Sonic Sampler	Water Level	7.3 b.g.s. (measured 10/10/18)	Top of Casing Elevation	392.87 feet msl
Size and Type of Well Casing	2" PVC Schedule 40	Screen Perforation	0.010 inch slotted	Ground Surface Elevation	389.76 feet msl
Seal or Backfill	Bentonite/Cement Grout	Coordinates	N 409,906.94 E 1,613,180.21	AKGWA #	8007-2994



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19

Client: Big River Electric Co.

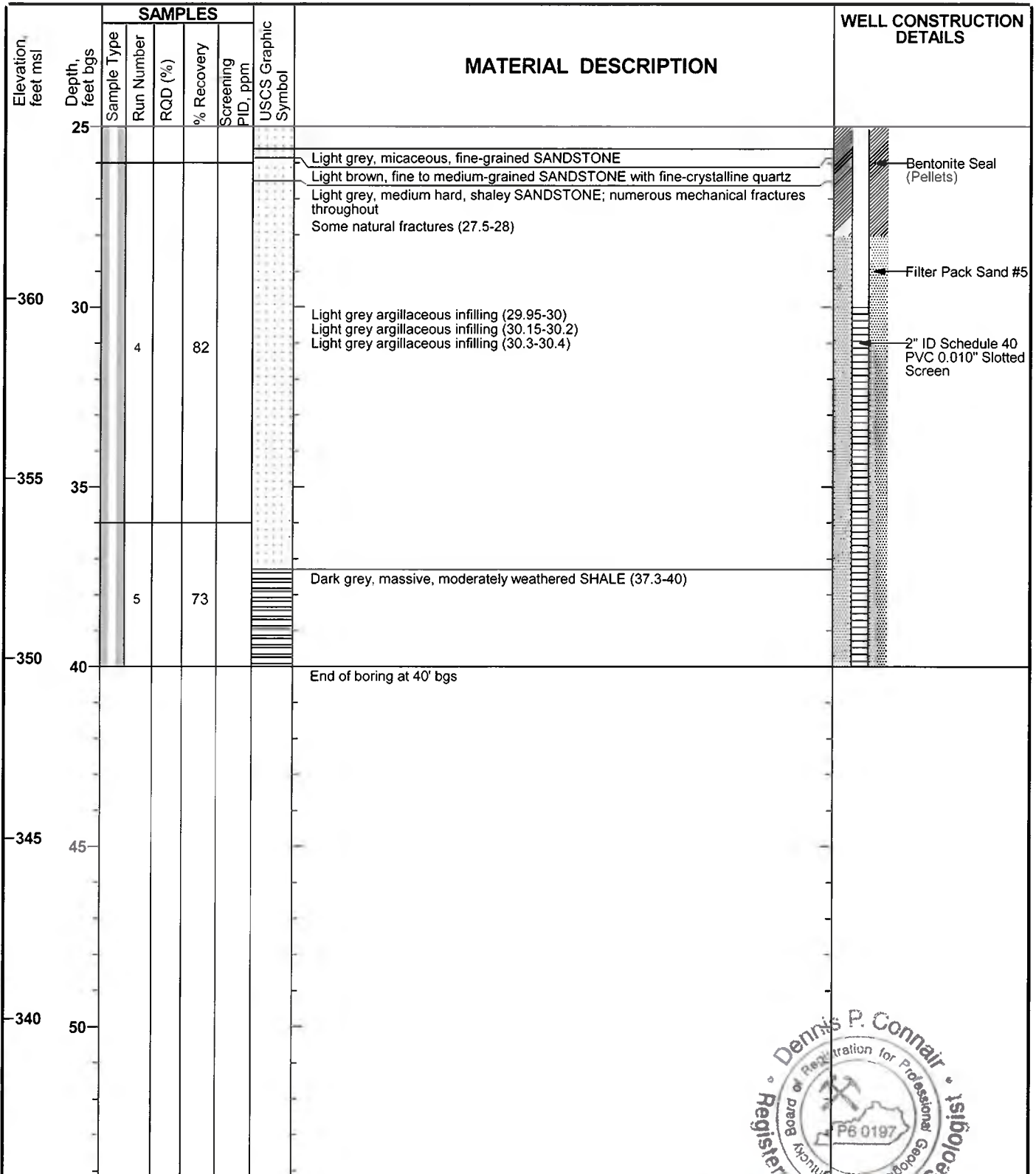
Project: DB Wilson Station

Site: Centertown, KY

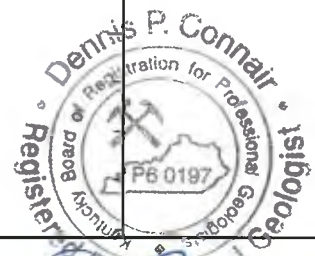
Project Number: 60589938

MW-104

Sheet 2 of 2



BREC MW INSTALL 2018 BR DBW OCT18 MW INSTALL GPJ 6/19/19

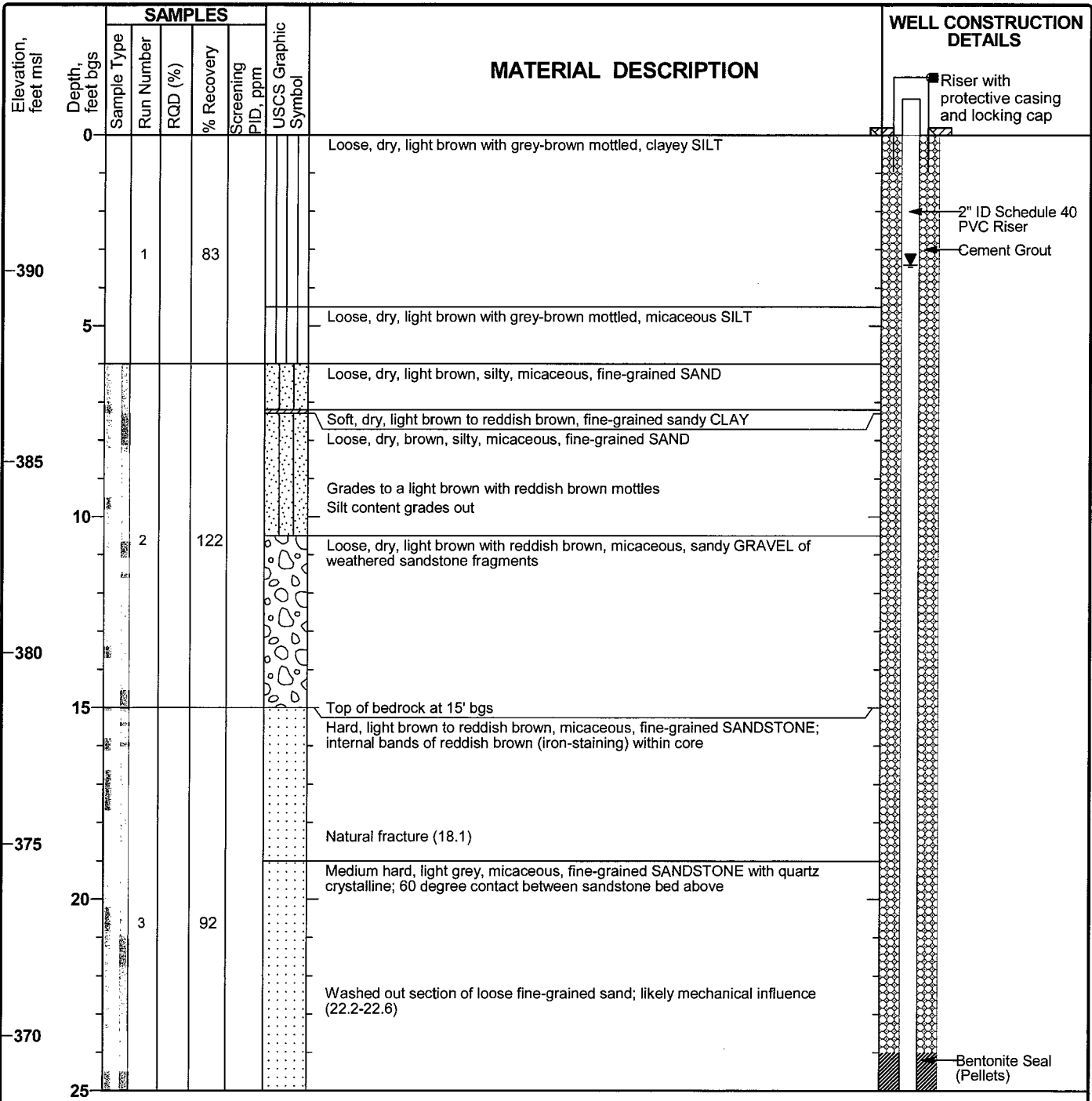


AECOM

**Client: Big River Electric Co.**  
**Project: DB Wilson Station**  
**Site: Centertown, KY**  
**Project Number: 60589938**

**MW-105**  
 Sheet 1 of 3

Date(s) Drilled and Installed	10/11/18-10/12/18	Logged By	S. Lillard	Reviewed By	M. Wagner
Drilling Method	Rotosonic	Drilling Contractor	Cascade	Total Depth of Borehole	60.0 feet
Sampling Method	4" Sonic Sampler	Water Level	3.4 b.g.s. (measured 10/13/18)	Top of Casing Elevation	396.74 feet msl
Size and Type of Well Casing	2" PVC Schedule 40	Screen Perforation	0.010 inch slotted	Ground Surface Elevation	393.56 feet msl
Seal or Backfill	Bentonite/Cement Grout	Coordinates	N 409,924.75 E 1,608,904.52	AKGWA #	8007-2992



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19

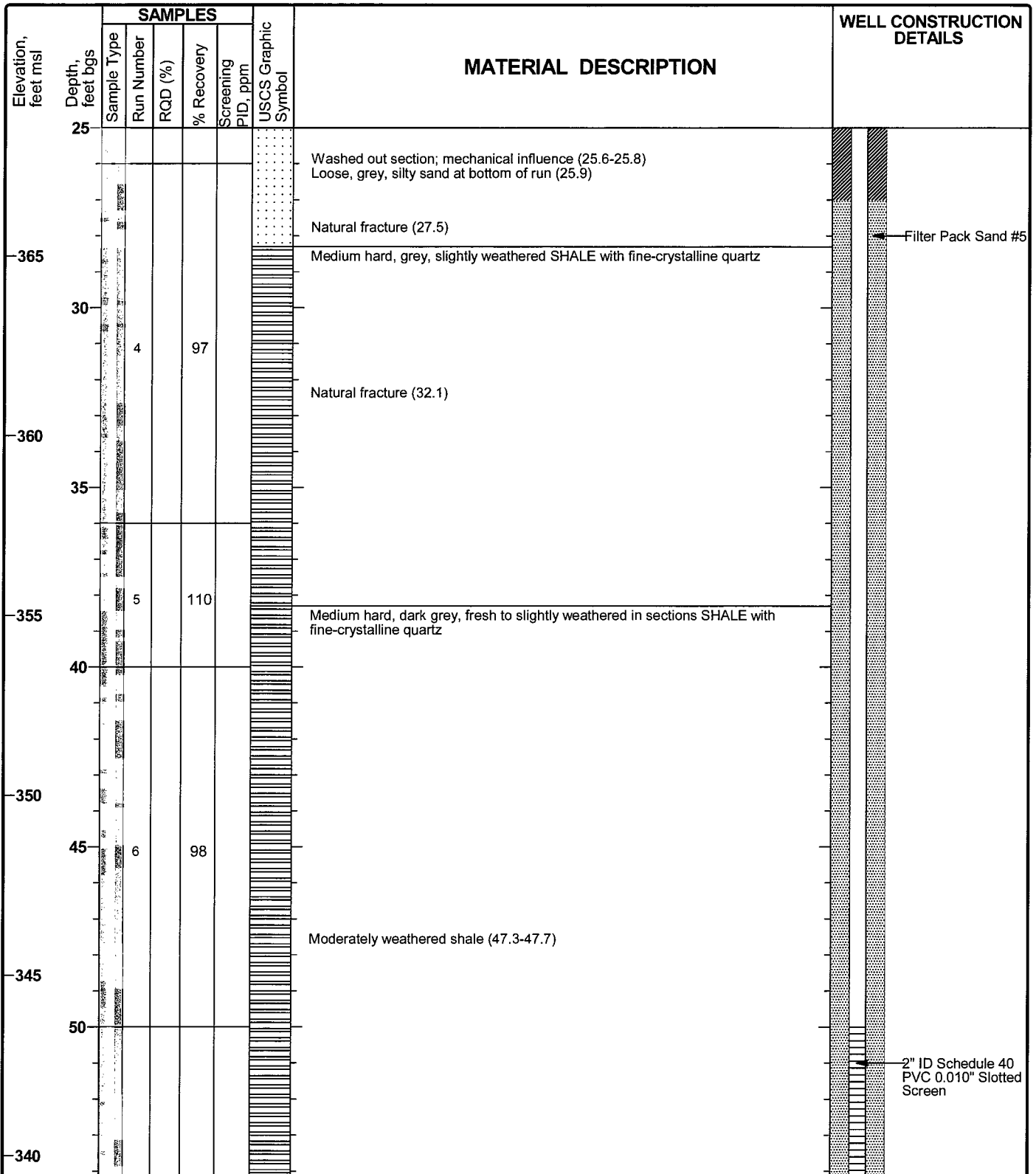


*M. Wagner*

Client: Big River Electric Co.  
 Project: DB Wilson Station  
 Site: Centertown, KY  
 Project Number: 60589938

MW-105

Sheet 2 of 3



BREC MW INSTALL 2018 BR\_DBIW\_OCT18 MW INSTALL.GPJ 6/19/19

Client: Big River Electric Co.

Project: DB Wilson Station

Site: Centertown, KY

Project Number: 60589938

MW-105

Sheet 3 of 3

Elevation, feet msl	Depth, feet bgs	SAMPLES					MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
		Sample Type	Run Number	RQD (%)	% Recovery	Screening PID, ppm USCS Graphic Symbol		
55	7		72					
335								
60						End of boring at 60' bgs		
330								
65								
325								
70								
320								
75								
315								
80								

BREC MW INSTALL 2018 BR DBW OCT18 MW INSTALL GPJ 6/19/19

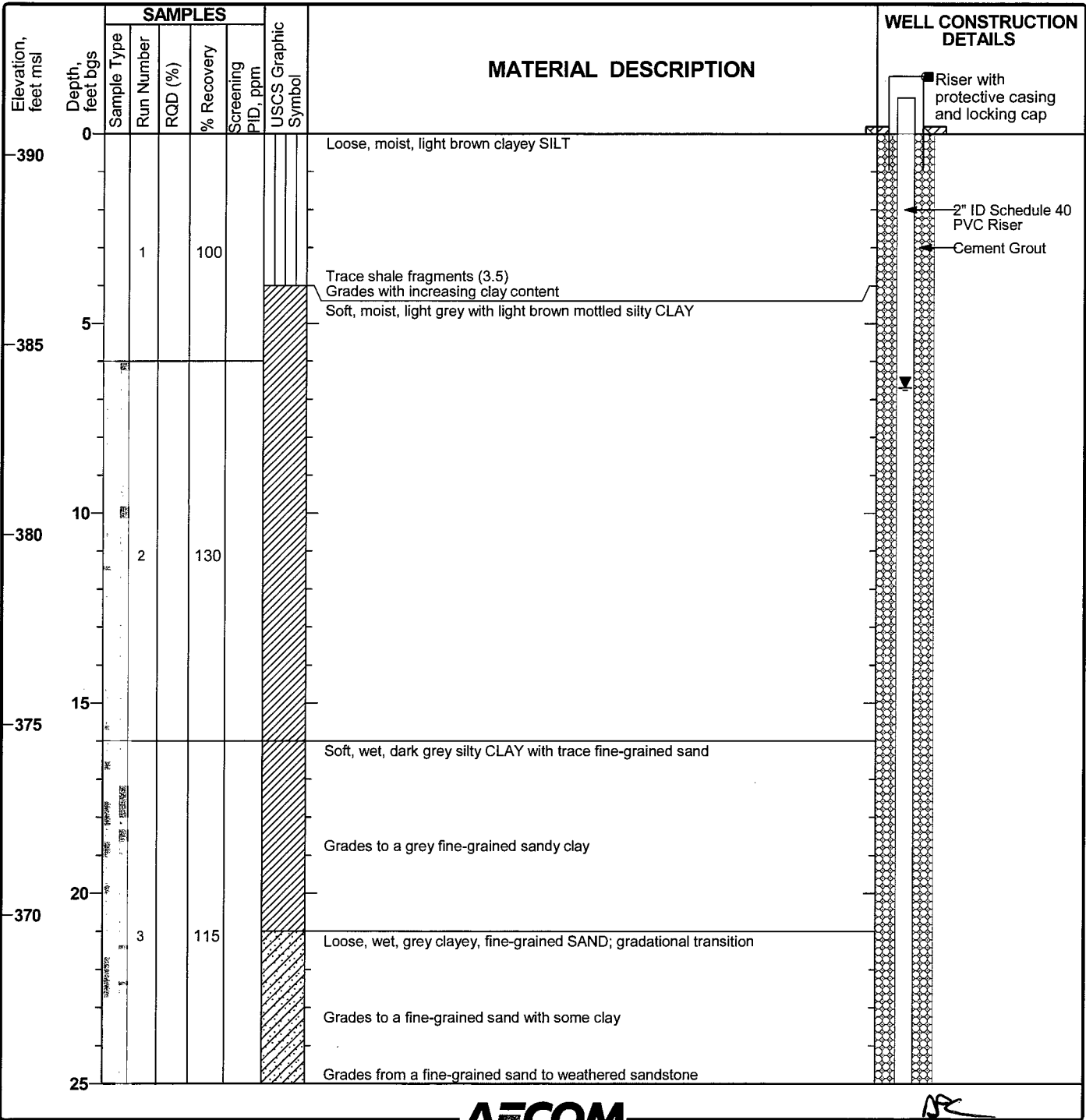
AECOM



Client: **Big River Electric Co.**  
 Project: **DB Wilson Station**  
 Site: **Centertown, KY**  
 Project Number: **60589938**

**MW-110**  
 Sheet 1 of 3

Date(s) Drilled and Installed	10/10/18-10/11/18	Logged By	S. Lillard	Reviewed By	M. Wagner
Drilling Method	Rotosonic	Drilling Contractor	Cascade	Total Depth of Borehole	76.0 feet
Sampling Method	4" Sonic Sampler	Water Level	6.7 b.g.s. (measured 10/11/18)	Top of Casing Elevation	393.54 feet msl
Size and Type of Well Casing	2" PVC Schedule 40	Screen Perforation	0.010 inch slotted	Ground Surface Elevation	390.56 feet msl
Seal or Backfill	Bentonite/Cement Grout	Coordinates	N 410,067.23 E 1,610,839.04	AKGWA #	8007-2996



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19



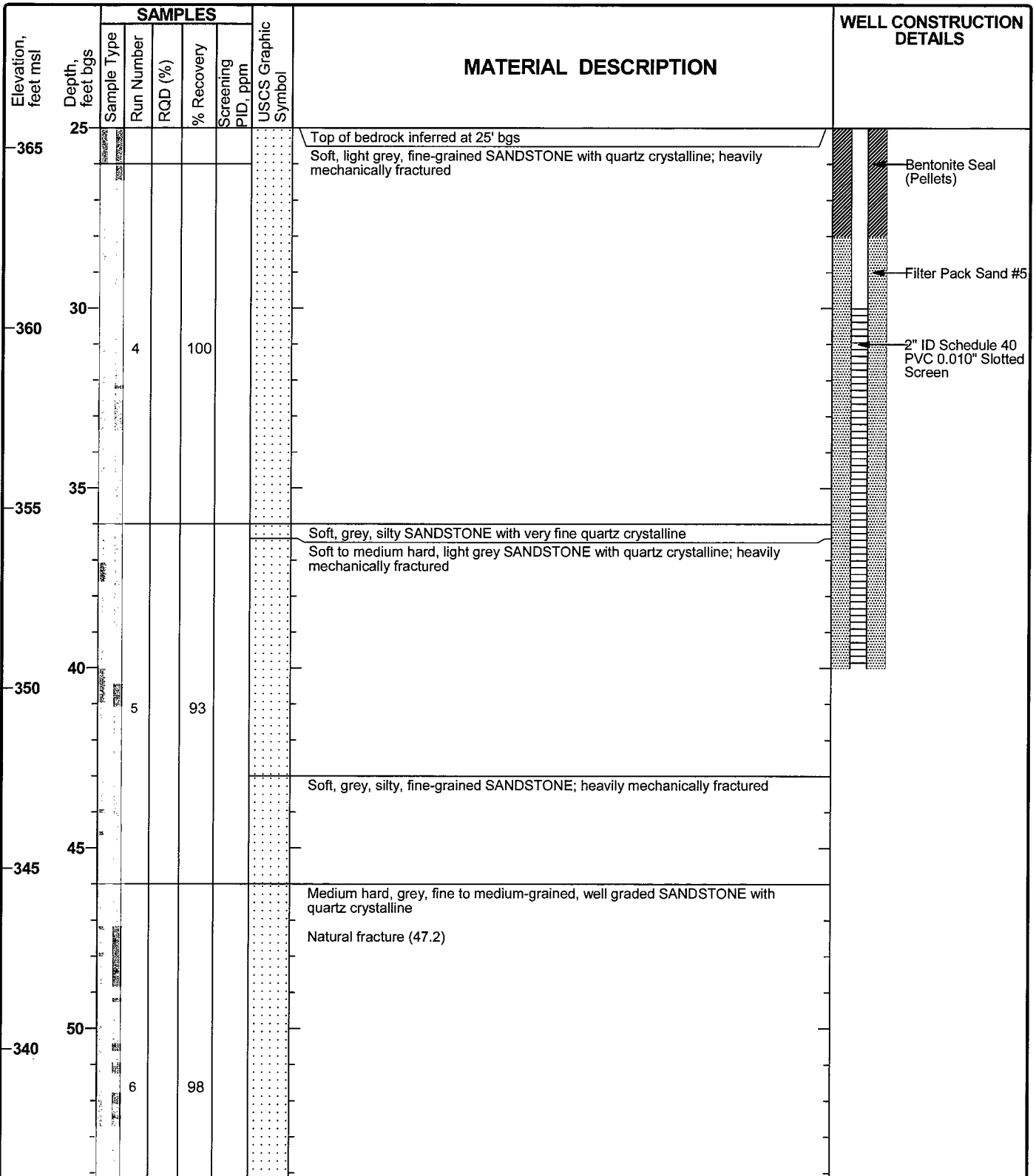
*DR*



Client: Big River Electric Co.  
 Project: DB Wilson Station  
 Site: Centertown, KY  
 Project Number: 60589938

MW-110

Sheet 2 of 3



BREC MW INSTALL 2018 BR\_DBIW\_OCT18 MW INSTALL.GPJ 6/19/19

*DR*

Client: Big River Electric Co.

Project: DB Wilson Station

Site: Centertown, KY

Project Number: 60589938

MW-110

Sheet 3 of 3

Elevation, feet msl	Depth, feet bgs	SAMPLES					USCS Graphic Symbol	MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
		Sample Type	Run Number	RQD (%)	% Recovery	Screening PID, ppm			
335	55							Soft, dark grey, massive SHALE	
								Soft, dark grey, SHALE; heavily mechanically fractured	
330	60		7		108			Medium hard, grey, massive SHALE	
								Mechanical fractured (61-61.9)	
325	65		8		114			Heavily mechanically fractured (65-69)	
								Moderately weathered fractures on shale bedding planes (69-72)	
320	70		9		98			Heavily mechanically fractured (72-73)	
								Soft, wet, dull, dark grey CLAY with some shale fragments	
315	75							Heavily mechanically fractured (75-76)	
								End of boring at 76' bgs; offset and redrill to 40' bgs and set monitoring well	
310	80								

BREC MW INSTALL 2018 BR DBIW OCT18 MW INSTALL.GPJ 6/19/19



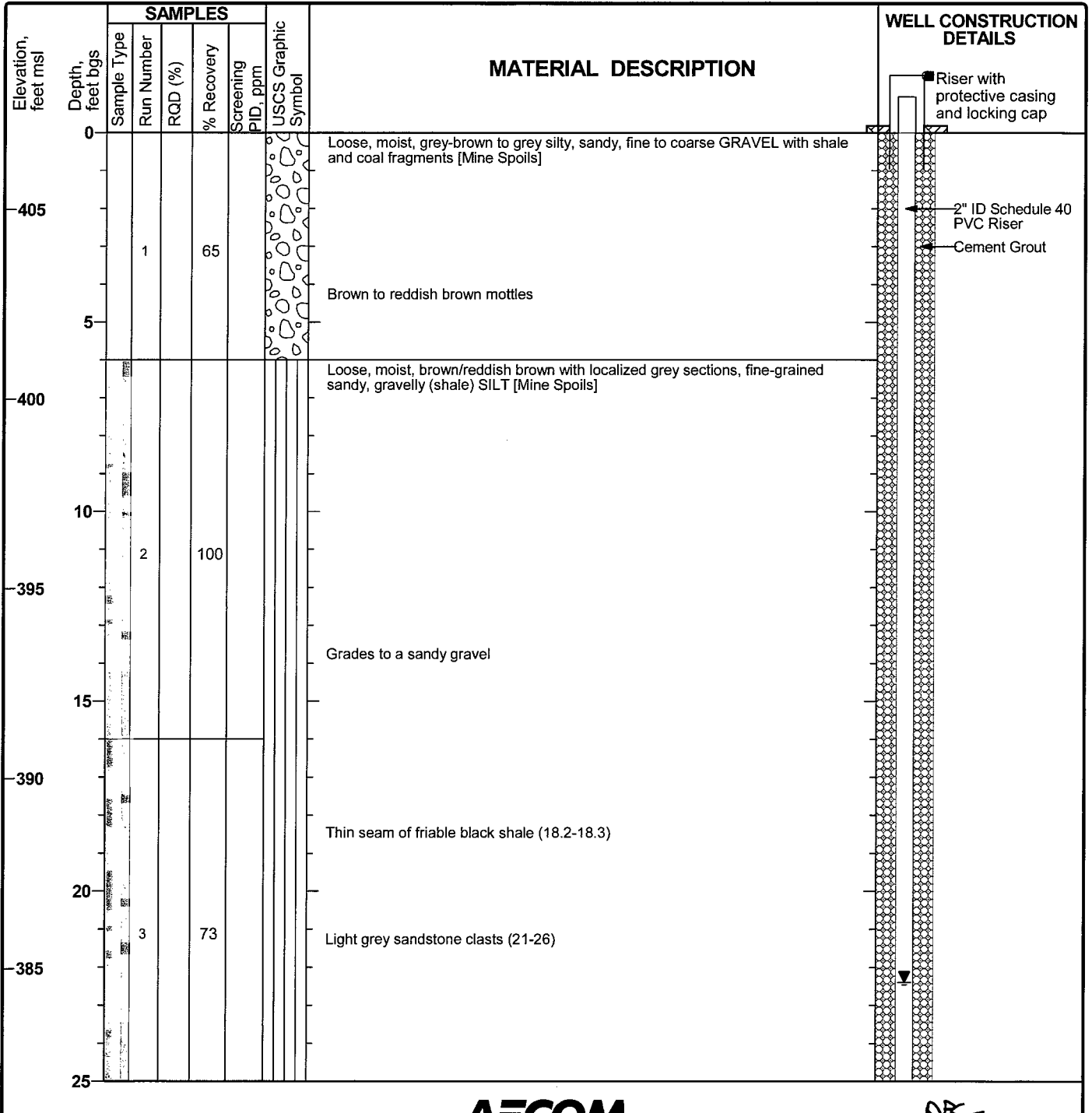
*[Handwritten Signature]*

Client: **Big River Electric Co.**  
 Project: **DB Wilson Station**  
 Site: **Centertown, KY**  
 Project Number: **60589938**

**MW-4D**

Sheet 1 of 4

Date(s) Drilled and Installed	10/12/18-10/13/18	Logged By	S. Lillard	Reviewed By	M. Wagner
Drilling Method	Rotosonic	Drilling Contractor	Cascade	Total Depth of Borehole	111.0 feet
Sampling Method	4" Sonic Sampler	Water Level	22.4 b.g.s. (measured 10/13/18)	Top of Casing Elevation	410.02 feet msl
Size and Type of Well Casing	2" PVC Schedule 40	Screen Perforation	0.010 inch slotted	Ground Surface Elevation	407.03 feet msl
Seal or Backfill	Bentonite/Cement Grout	Coordinates	N 410,815.65 E 1,612,469.03	AKGWA #	8007-4811



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19

Client: Big River Electric Co.  
 Project: DB Wilson Station  
 Site: Centertown, KY  
 Project Number: 60589938

MW-4D

Sheet 2 of 4

Elevation, feet msl	Depth, feet bgs	SAMPLES					USCS Graphic Symbol	MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
		Sample Type	Run Number	RQD (%)	% Recovery	Screening PID, ppm			
25									
380									
30			4		51		Grey shale clasts (29-41)		
375									
35									
370									
40									
365			5		76		Medium hard, light grey, micaceous, fine-grained SANDSTONE clasts [Mine Spoils]		
45									
360									
50							Loose, light brown, fine to medium-grained SAND [Mine Spoils]		
							Argillaceous, sandy GRAVEL (shale) with seams of sand and silt and trace coal fragments [Mine Spoils]		
355			6		79		Coal fragments grade out		

BREC MW INSTALL 2018 BR\_DBIW\_OCT18 MW INSTALL.GPJ 6/19/19

Client: Big River Electric Co.  
 Project: DB Wilson Station  
 Site: Centertown, KY  
 Project Number: 60589938

MW-4D

Sheet 3 of 4

Elevation, feet msl	Depth, feet bgs	SAMPLES				USCS Graphic Symbol	MATERIAL DESCRIPTION	WELL CONSTRUCTION DETAILS
		Sample Type	Run Number	RQD (%)	% Recovery			
55								
350								
60			7		78			
345								
65								
340								
70			8		78			
335								
75								
330								
80			9		37			
325								

Bentonite Seal (Pellets)

Filter Pack Sand #5

BREC MW INSTALL 2018 BR\_DEW\_OCT18 MW INSTALL.GPJ 6/19/19

Client: Big River Electric Co.

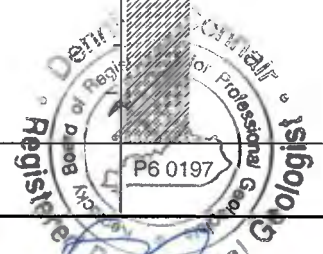
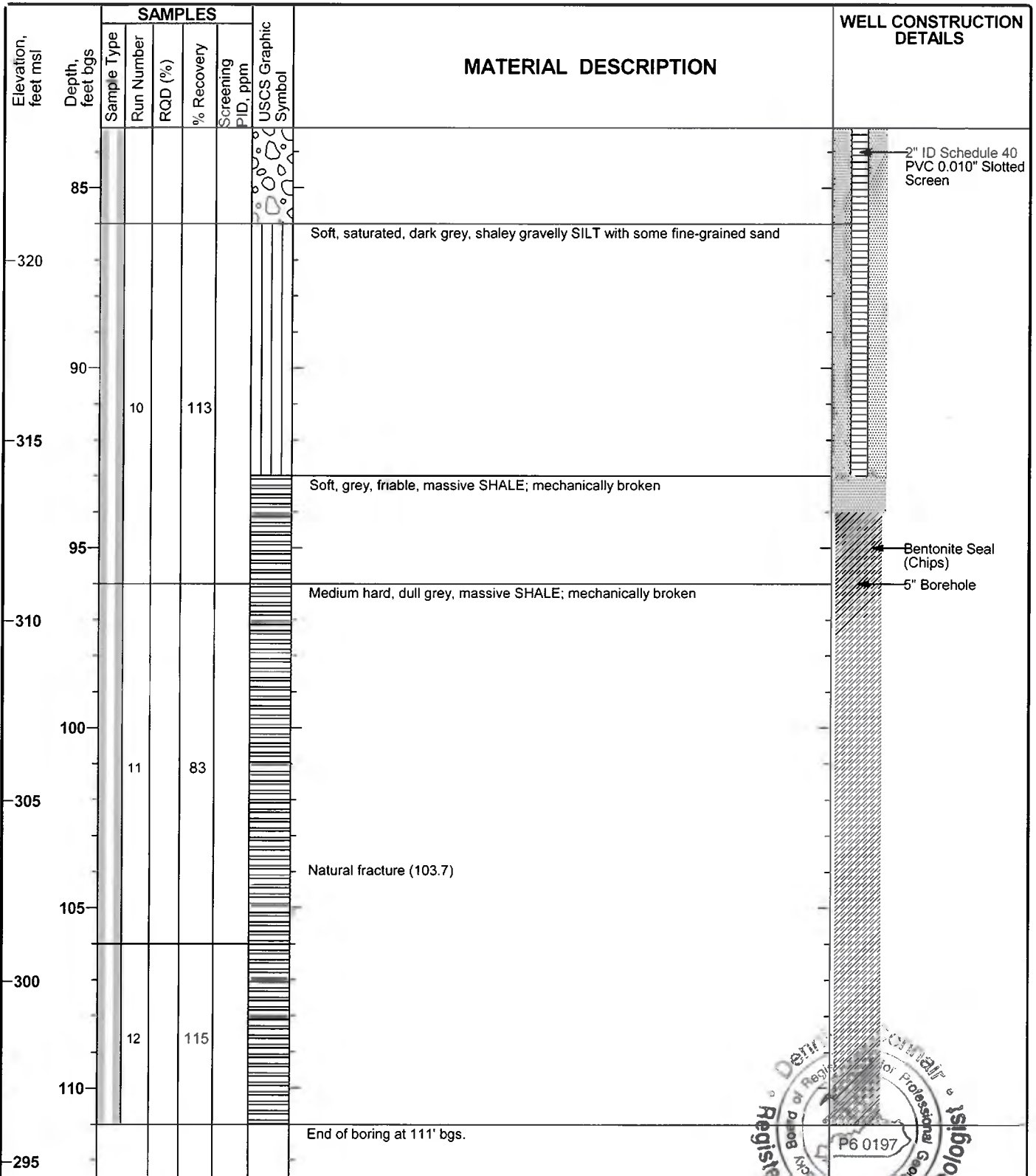
Project: DB Wilson Station

Site: Centertown, KY

Project Number: 60589938

MW-4D

Sheet 4 of 4



BREC MW INSTALL 2018 BR\_DBW\_OCT18 MW INSTALL.GPJ 6/19/19



**Appendix B**  
**Kentucky Well Records**

**UNIFORM KENTUCKY WELL CONSTRUCTION RECORD**

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

<b>Owner Name(*)</b>	Big Rivers Electric Corporation		
<b>Owner First Name(*)</b>	NA	<b>Owner Last Name(*)</b>	NA
<b>Owner Address(*)</b>	PO Box 24		
<b>Owner City(*)</b>	Henderson	<b>State(*)</b>	Kentucky
<b>Owner Zip(*)</b>	42419-0024		
<b>Owner Phone(*)</b>	270-844-6031	<b>Owner eMail</b>	

<b>Site Name(*)</b>	D.B. Wilson Station		
<b>Site Address(*)</b>	5633 State Route 85 W		
<b>Site City(*)</b>	Centertown	<b>State(*)</b>	Kentucky
<b>Site Zip(*)</b>	42328		
<b>Site Phone</b>	270-821-7343	<b>Site eMail</b>	

<b>Well Latitude(*)</b>	37.461724	<b>Well Longitude(*)</b>	-87.076285	<b>Method(*)</b>	Paper or Internet Map Interpx
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<b>Agency Interest (AI) Number</b>	3319	<b>Facility Type &amp; ID</b>	Solid Waste
<b>USGS Topo Map(*)</b>	EQUALITY	<b>County(*)</b>	Ohio
<b>Surface elevation (ft)</b>	387.0	<b>Elevation determined by</b>	Topographic map interpolation
<b>Physiographic Region(*)</b>	W. Coal Field	<b>Well Use(*)</b>	Monitoring well - compliance
<b>Drilling Method(*)</b>	Sonic	<b>Well Status(*)</b>	active
<b>Wellhead(*)</b>	Locking Cap	<b>Well Condition(*)</b>	Functioning properly

Casing / Open Borehole					
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	26.0	6.0	2.0	PVC
Add New					

Screen						
	From depth (ft)(*)(*)	To depth (ft)(*)(*)	Borehole diameter (in)(*)(*)	Screen diameter (in)(*)(*)	Screen Type(*)	Screen slot size(*)
Delete	26.0	36.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal				
	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	22.0	Mixture - bentonite & cement
Delete	Seal	22.0	24.0	Bentonite
Delete	Filter Pack	24.0	36.5	Sand
Add New				

Lithologic log			
	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

<b>Site Map/Sketch Map(*)</b>	Choose File No file chosen
<b>Well Diagram (monitoring well)</b>	Choose File No file chosen
<b>Coliform analysis (if applicable)</b>	Choose File No file chosen
<b>Signed variance (if applicable)</b>	Choose File No file chosen
<b>Other laboratory analysis report (if applicable)</b>	Choose File No file chosen
<b>Casing/Screen Supplemental Info</b>	Choose File No file chosen

**Comments** 3'x3' concrete pad w/ 4 bollards.

Affirmation: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

<b>Signature of certified driller &amp; PIN(*)</b>	Todd W Mills	<b>Date Signed(*)</b>	11/14/2018
<b>Driller First Name(*)</b>	Todd	<b>Driller Last Name(*)</b>	Mills
<b>Certification Number(*)</b>	0344-0454-00	<b>Certification Company(*)</b>	Chase Environmental Group, Inc.

<b>Kentucky Well ID (AKGWA) Number(*)</b>	8007-2995
<b>Owner Well ID</b>	MW-102
<b>Work Start Date(*)</b>	10/13/2018
<b>Work End Date(*)</b>	10/17/2018
<b>Total depth (ft)(*)</b>	36.0
<b>Depth to bedrock (ft)</b>	
<b>Static water level (ft)</b>	15.0
<b>SWL method(*)</b>	Reported
<b>Casing height above surface (in)</b>	30

WATER WELLS ONLY	
<b>Estimated well yield</b>	
<b>Well Yield Method</b>	
<b>Well service (# of people served)</b>	
<b>Disinfectant amount</b>	
<b>Disinfectant type</b>	
<b>Pitless adapter installed</b>	
<b>Pump installed</b>	
<b>Depth to intake (ft)</b>	
<b>Apparent quality and odor:</b>	
<b>Appearance</b>	
<b>Odor Type</b>	
<b>Odor-Level</b>	
<b>Coliform Test</b>	
<b>Coliform test type</b>	
<b>Coliform test results</b>	or # colonies per 100 ml
<b>Date Sampled</b>	
<b>Date Analyzed</b>	

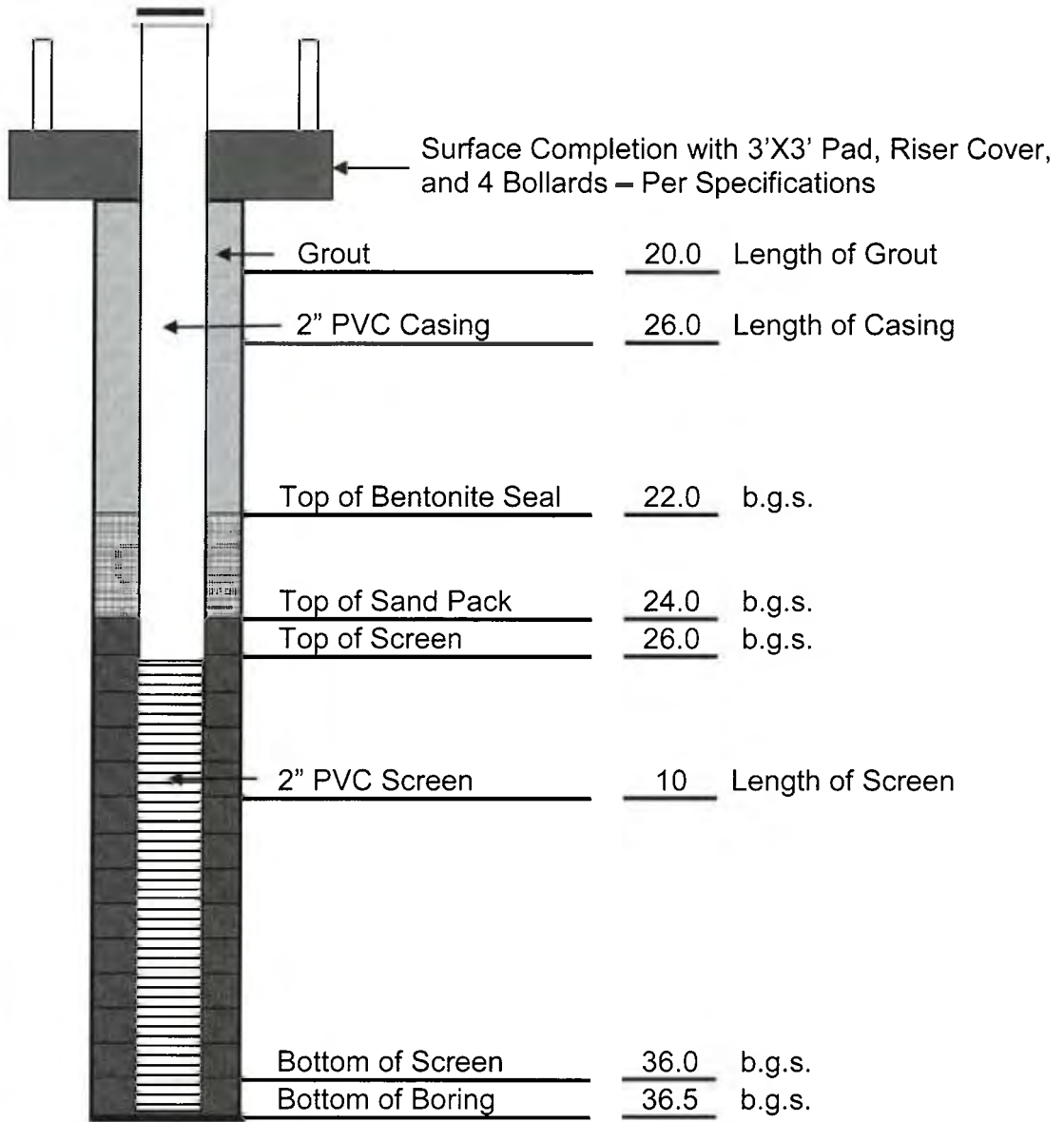
For Internal Staff Use Only	
<b>Date Received:</b>	
<b>Date Mapped:</b>	
<b>Mapped By:</b>	

Save For Future Retrieval Submit to DEP



# MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-2995
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-102



Depth to Groundwater	15.0	Total Depth of Boring (ft)	36.5	Total Depth of Well (ft)	36.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	36.5	Drilling in Consolidated	N/A
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk



Comments: Drawing not to scale.

**UNIFORM KENTUCKY WELL CONSTRUCTION RECORD**

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

<b>Owner Name(*)</b>	Big Rivers Electric Corporation		
<b>Owner First Name(*)</b>	NA	<b>Owner Last Name(*)</b>	NA
<b>Owner Address(*)</b>	PO Box 24		
<b>Owner City(*)</b>	Henderson	<b>State(*)</b>	Kentucky
<b>Owner Zip(*)</b>	42419-0024		
<b>Owner Phone(*)</b>	270-844-6031	<b>Owner eMail</b>	

<b>Site Name(*)</b>	D.B. Wilson Station		
<b>Site Address(*)</b>	5633 State Route 85 W		
<b>Site City(*)</b>	Centertown	<b>State(*)</b>	Kentucky
<b>Site Zip(*)</b>	42328		
<b>Site Phone</b>	270-821-7343	<b>Site eMail</b>	

<b>Well Latitude(*)</b>	37.451828	<b>Well Longitude(*)</b>	-87.082937	<b>Method(*)</b>	Paper or Internet Map Interp.
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<b>Agency Interest (AI) Number</b>	3319	<b>Facility Type &amp; ID</b>	Solid Waste
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<b>USGS Topo Map(*)</b>	EQUALITY	<b>County(*)</b>	Ohio
<b>Surface elevation (ft)</b>	385.0	<b>Elevation determined by</b>	Topographic map interpolation
<b>Physiographic Region(*)</b>	W. Coal Field	<b>Well Use(*)</b>	Monitoring well - compliance
<b>Drilling Method(*)</b>	Sonic	<b>Well Status(*)</b>	active
<b>Wellhead(*)</b>	Locking Cap	<b>Well Condition(*)</b>	Functioning properly

Casing / Open Borehole					
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	30.0	6.0	2.0	PVC
Add New					

Screen						
	From depth (ft)(*)(*)	To depth (ft)(*)(*)	Borehole diameter (in)(*)(*)	Screen diameter (in)(*)(*)	Screen Type(*)	Screen slot size(*)
Delete	30.0	40.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal				
	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	25.0	Mixture - bentonite & cement
Delete	Seal	25.0	28.0	Bentonite
Delete	Filter Pack	28.0	40.5	Sand
Add New				

Lithologic log			
	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

<b>Site Map/Sketch Map(*)</b>	Choose File No file chosen
<b>Well Diagram (monitoring well)</b>	Choose File No file chosen
<b>Coliform analysis (if applicable)</b>	Choose File No file chosen
<b>Signed variance (if applicable)</b>	Choose File No file chosen
<b>Other laboratory analysis report (if applicable)</b>	Choose File No file chosen
<b>Casing/Screen Supplemental Info</b>	Choose File No file chosen

**Comments** 3'X3' concrete pad w/ 4 bollards.

Affirmation: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

<b>Signature of certified driller &amp; PIN(*)</b>	Todd W Mills	<b>Date Signed(*)</b>	11/14/2018
<b>Driller First Name(*)</b>	Todd	<b>Driller Last Name(*)</b>	Mills
<b>Certification Number(*)</b>	0344-0454-00	<b>Certification Company(*)</b>	Chase Environmental Group, Inc.

<b>Kentucky Well ID (AKGWA) Number(*)</b>	8007-2994
<b>Owner Well ID</b>	MW-104
<b>Work Start Date(*)</b>	10/09/2018
<b>Work End Date(*)</b>	10/17/2018
<b>Total depth (ft)(*)</b>	40.0
<b>Depth to bedrock (ft)</b>	93.0
<b>Static water level (ft)</b>	38.0
<b>SWL method(*)</b>	Reported
<b>Casing height above surface (in)</b>	30

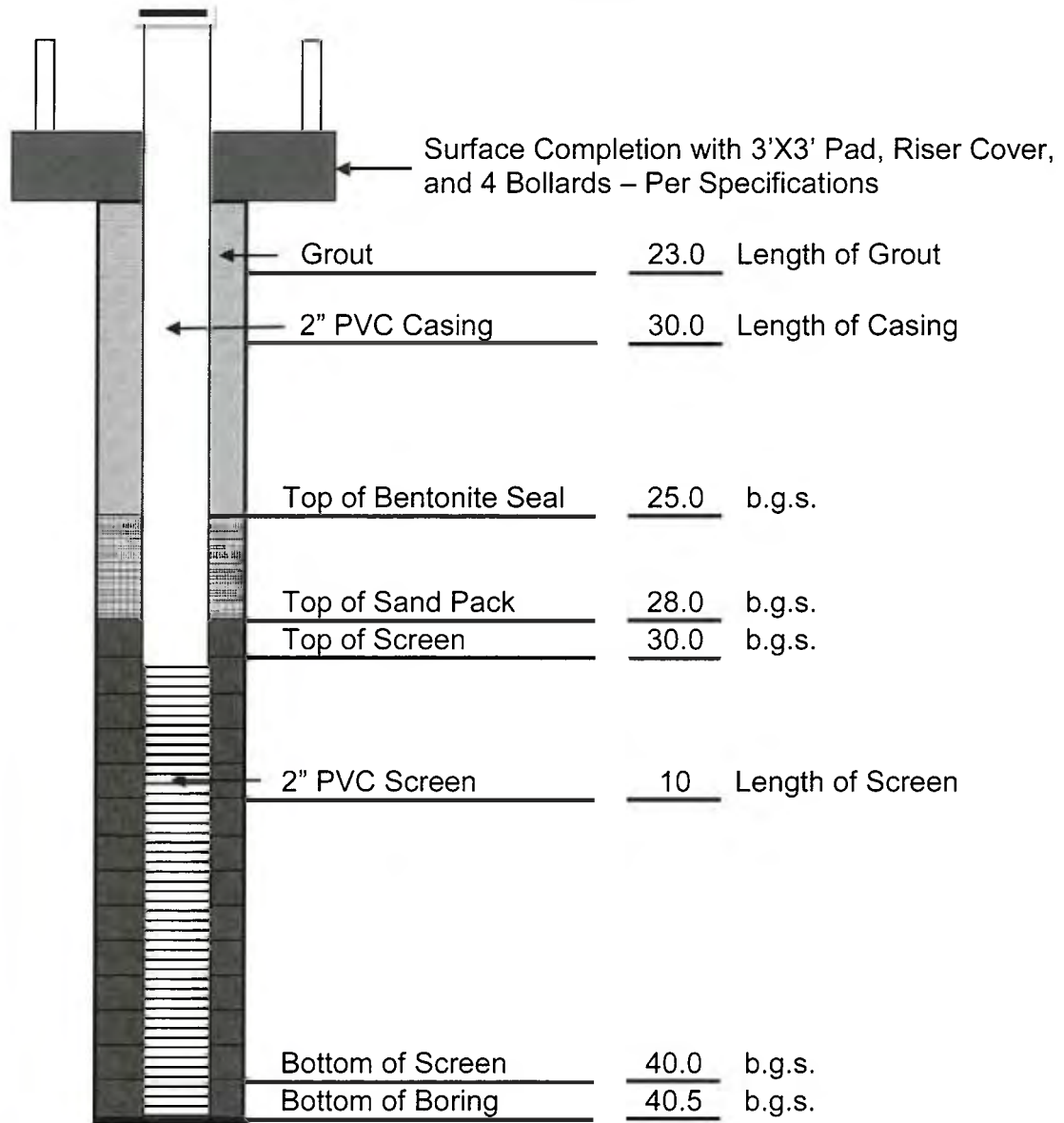
WATER WELLS ONLY	
<b>Estimated well yield</b>	
<b>Well Yield Method</b>	
<b>Well service (# of people served)</b>	
<b>Disinfectant amount</b>	
<b>Disinfectant type</b>	
<b>Pitless adapter installed</b>	
<b>Pump installed</b>	
<b>Depth to Intake (ft)</b>	
<b>Apparent quality and odor:</b>	
<b>Appearance</b>	
<b>Odor Type</b>	
<b>Odor-Level</b>	
<b>Coliform Test</b>	
<b>Coliform test type</b>	
<b>Coliform test results</b>	# colonies per 100 ml
<b>Date Sampled</b>	
<b>Date Analyzed</b>	

For Internal Staff Use Only	
<b>Date Received:</b>	
<b>Date Mapped:</b>	
<b>Mapped By:</b>	

Save For Future Retrieval | Submit to DEP

# MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-2994
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-104



Depth to Groundwater	31.2	Total Depth of Boring (ft)	40.5	Total Depth of Well (ft)	40.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	6.0	Drilling in Consolidated	36.5
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk



Comments: Drawing not to scale.

**UNIFORM KENTUCKY WELL CONSTRUCTION RECORD**

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

<b>Owner Name(*)</b>	Big Rivers Electric Corporation		
<b>Owner First Name(*)</b>	NA	<b>Owner Last Name(*)</b>	NA
<b>Owner Address(*)</b>	PO Box 24		
<b>Owner City(*)</b>	Henderson	<b>State(*)</b>	Kentucky
<b>Owner Zip(*)</b>	42419-0024		
<b>Owner Phone(*)</b>	270-844-6031	<b>Owner eMail</b>	

<b>Site Name(*)</b>	D.B. Wilson Station		
<b>Site Address(*)</b>	5633 State Route 85 W		
<b>Site City(*)</b>	Centertown	<b>State(*)</b>	Kentucky
<b>Site Zip(*)</b>	42328		
<b>Site Phone</b>	270-821-7343	<b>Site eMail</b>	

<b>Well Latitude(*)</b>	37.451726	<b>Well Longitude(*)</b>	-87.097313	<b>Method(*)</b>	Paper or Internet Map Interp
<small>DMS to DD Converter</small>					

<b>Agency Interest (AI) Number</b>	3319	<b>Facility Type &amp; ID</b>	Solid Waste
			Special Waste Landfill

<b>USGS Topo Map(*)</b>	EQUALITY	<b>County(*)</b>	Ohio
<b>Surface elevation (ft)</b>	395.0	<b>Elevation determined by</b>	Topographic map interpolation
<b>Physiographic Region(*)</b>	W. Coal Field	<b>Well Use(*)</b>	Monitoring well - compliance
<b>Drilling Method(*)</b>	Sonic	<b>Well Status(*)</b>	active
<b>Wellhead(*)</b>	Locking Cap	<b>Well Condition(*)</b>	Functioning properly

Casing / Open Borehole					
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	50.0	6.0	2.0	PVC
Add New					

Screen						
	From depth (ft)(*)(*)	To depth (ft)(*)(*)	Borehole diameter (in)(*)(*)	Screen diameter (in)(*)(*)	Screen Type(*)	Screen slot size(*)
Delete	50.0	60.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal				
	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	24.0	Mixture - bentonite & cement
Delete	Seal	24.0	27.0	Bentonite
Delete	Filter Pack	27.0	60.5	Sand
Add New				

Lithologic log			
	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

<b>Site Map/Sketch Map(*)</b>	Choose File No file chosen
<b>Well Diagram (monitoring well)</b>	Choose File No file chosen
<b>Coliform analysis (if applicable)</b>	Choose File No file chosen
<b>Signed variance (if applicable)</b>	Choose File No file chosen
<b>Other laboratory analysis report (if applicable)</b>	Choose File No file chosen
<b>Casing/Screen Supplemental Info</b>	Choose File No file chosen

**Comments** 3'X3' concrete pad w/ 4 bollards.

Affirmation: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

<b>Signature of certified driller &amp; PIN(*)</b>	Todd W Mills	<b>Date Signed(*)</b>	11/14/2018
<b>Driller First Name(*)</b>	Todd	<b>Driller Last Name(*)</b>	Mills
<b>Certification Number(*)</b>	0344-0454-00	<b>Certification Company(*)</b>	Chase Environmental Group, Inc.

<b>Kentucky Well ID (AKGWA) Number(*)</b>	8007-2992
<b>Owner Well ID</b>	MW-105
<b>Work Start Date(*)</b>	10/11/2018
<b>Work End Date(*)</b>	10/17/2018
<b>Total depth (ft)(*)</b>	60.0
<b>Depth to bedrock (ft)</b>	15.0
<b>Static water level (ft)</b>	53.0
<b>SWL method(*)</b>	Reported
<b>Casing height above surface (in)</b>	30

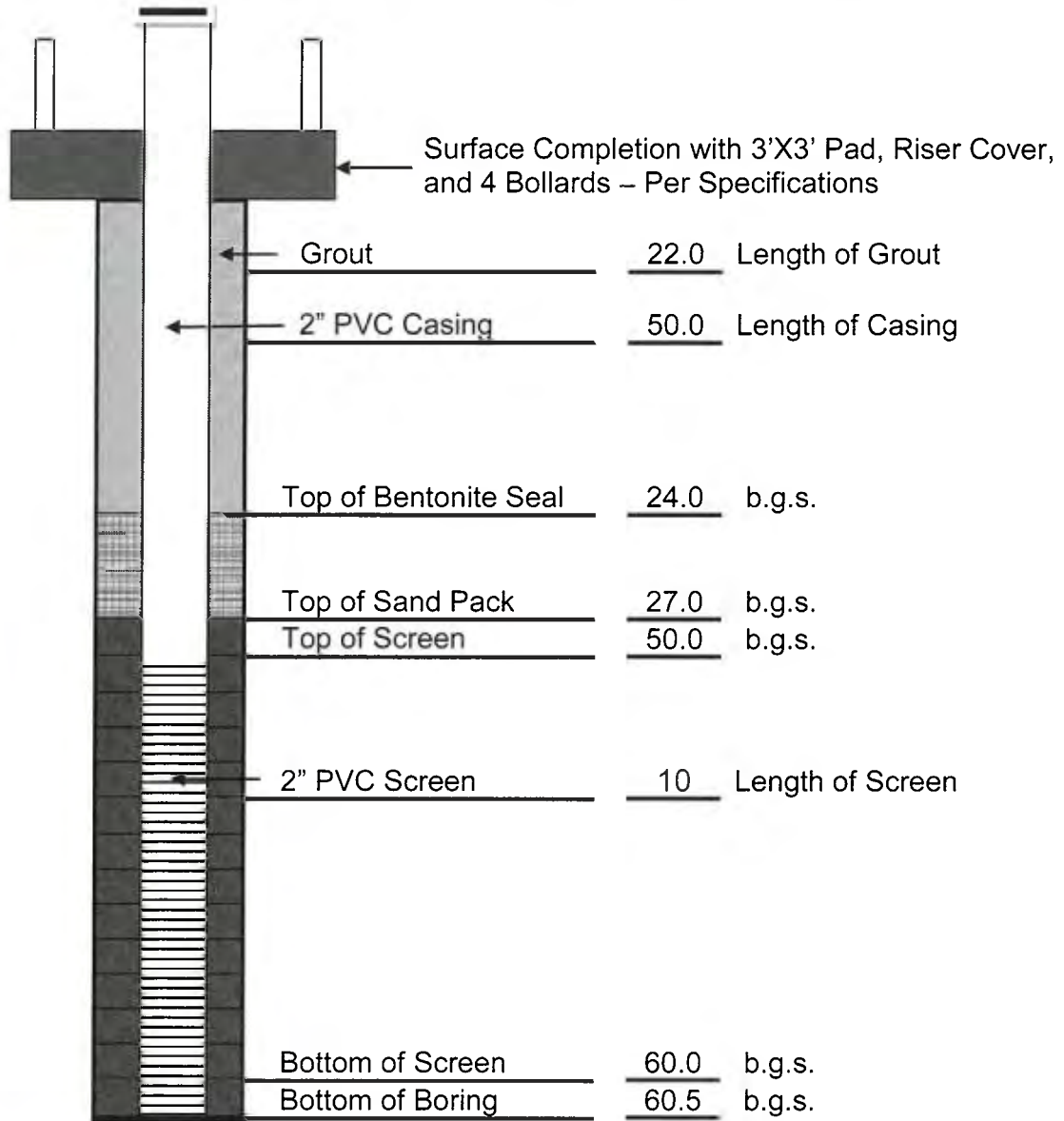
WATER WELLS ONLY	
<b>Estimated well yield</b>	
<b>Well Yield Method</b>	
<b>Well service (# of people served)</b>	
<b>Disinfectant amount</b>	
<b>Disinfectant type</b>	
<b>Pitless adapter installed</b>	
<b>Pump installed</b>	
<b>Depth to intake (ft)</b>	
<b>Apparent quality and odor:</b>	
<b>Appearance</b>	
<b>Odor Type</b>	
<b>Odor-Level</b>	
<b>Coliform Test</b>	
<b>Coliform test type</b>	
<b>Coliform test results</b>	OR # colonies per 100 ml
<b>Date Sampled</b>	
<b>Date Analyzed</b>	

For Internal Staff Use Only	
<b>Date Received:</b>	
<b>Date Mapped:</b>	
<b>Mapped By:</b>	

Save For Future Retrieval    Submit to DEP

# MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-2992
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-105



Depth to Groundwater	53.0	Total Depth of Boring (ft)	60.5	Total Depth of Well (ft)	60.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	15.0	Drilling in Consolidated	45.5
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk

**ceg CHASE**  
Environmental Group INC

Comments: Drawing not to scale.

**UNIFORM KENTUCKY WELL CONSTRUCTION RECORD**

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

<b>Owner Name(*)</b>	Big Rivers Electric Corporation		
<b>Owner First Name(*)</b>	NA	<b>Owner Last Name(*)</b>	NA
<b>Owner Address(*)</b>	PO Box 24		
<b>Owner City(*)</b>	Henderson	<b>State(*)</b>	Kentucky
<b>Owner Zip(*)</b>	42419-0024		
<b>Owner Phone(*)</b>	270-844-6031	<b>Owner eMail</b>	

<b>Site Name(*)</b>	D.B. Wilson Station		
<b>Site Address(*)</b>	5633 State Route 85 W		
<b>Site City(*)</b>	Centertown	<b>State(*)</b>	Kentucky
<b>Site Zip(*)</b>	42328		
<b>Site Phone</b>	270-821-7343	<b>Site eMail</b>	
<b>Well Latitude(*)</b>	37.452075	<b>Well Longitude(*)</b>	-87.090307
<b>Method(*)</b>	Paper or Internet Map Interp		

<b>Agency Interest (AI) Number</b>	3319	<b>Facility Type &amp; ID</b>	Solid Waste
<b>USGS Topo Map(*)</b>	EQJALITY	<b>County(*)</b>	Ohio
<b>Surface elevation (ft)</b>	390.0	<b>Elevation determined by</b>	Topographic map interpolation
<b>Physiographic Region(*)</b>	W. Coal Field	<b>Well Use(*)</b>	Monitoring well - compliance
<b>Drilling Method(*)</b>	Sonic	<b>Well Status(*)</b>	active
<b>Wellhead(*)</b>	Locking Cap	<b>Well Condition(*)</b>	Functioning properly

Casing / Open Borehole					
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	30.0	6.0	2.0	PVC
Add New					

Screen						
	From depth (ft)(*)(*)	To depth (ft)(*)(*)	Borehole diameter (in)(*)(*)	Screen diameter (in)(*)(*)	Screen Type(*)	Screen slot size(*)
Delete	30.0	40.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal				
	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	26.0	Mixture - bentonite & cement
Delete	Seal	26.0	28.0	Bentonite
Delete	Filter Pack	28.0	40.5	Sand
Add New				

Lithologic log			
	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

<b>Site Map/Sketch Map(*)</b>	Choose File No file chosen
<b>Well Diagram (monitoring well)</b>	Choose File No file chosen
<b>Coliform analysis (if applicable)</b>	Choose File No file chosen
<b>Signed variance (if applicable)</b>	Choose File No file chosen
<b>Other laboratory analysis report (if applicable)</b>	Choose File No file chosen
<b>Casing/Screen Supplemental Info</b>	Choose File No file chosen

**Comments** 3'X3' concrete pad w/ 4 bollards.

**Affirmation:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

<b>Signature of certified driller &amp; PIN(*)</b>	Todd W Mills	<b>Date Signed(*)</b>	11/14/2018
<b>Driller First Name(*)</b>	Todd	<b>Driller Last Name(*)</b>	Mills
<b>Certification Number(*)</b>	0344-0454-00	<b>Certification Company(*)</b>	Chase Environmental Group, Inc.

<b>Kentucky Well ID (AKGWA) Number(*)</b>	8007-2996
<b>Owner Well ID</b>	MW-110
<b>Work Start Date(*)</b>	10/11/2018
<b>Work End Date(*)</b>	10/17/2018
<b>Total depth (ft)(*)</b>	40.0
<b>Depth to bedrock (ft)</b>	25.0
<b>Static water level (ft)</b>	7.0
<b>SWL method(*)</b>	Reported
<b>Casing height above surface (in)</b>	30

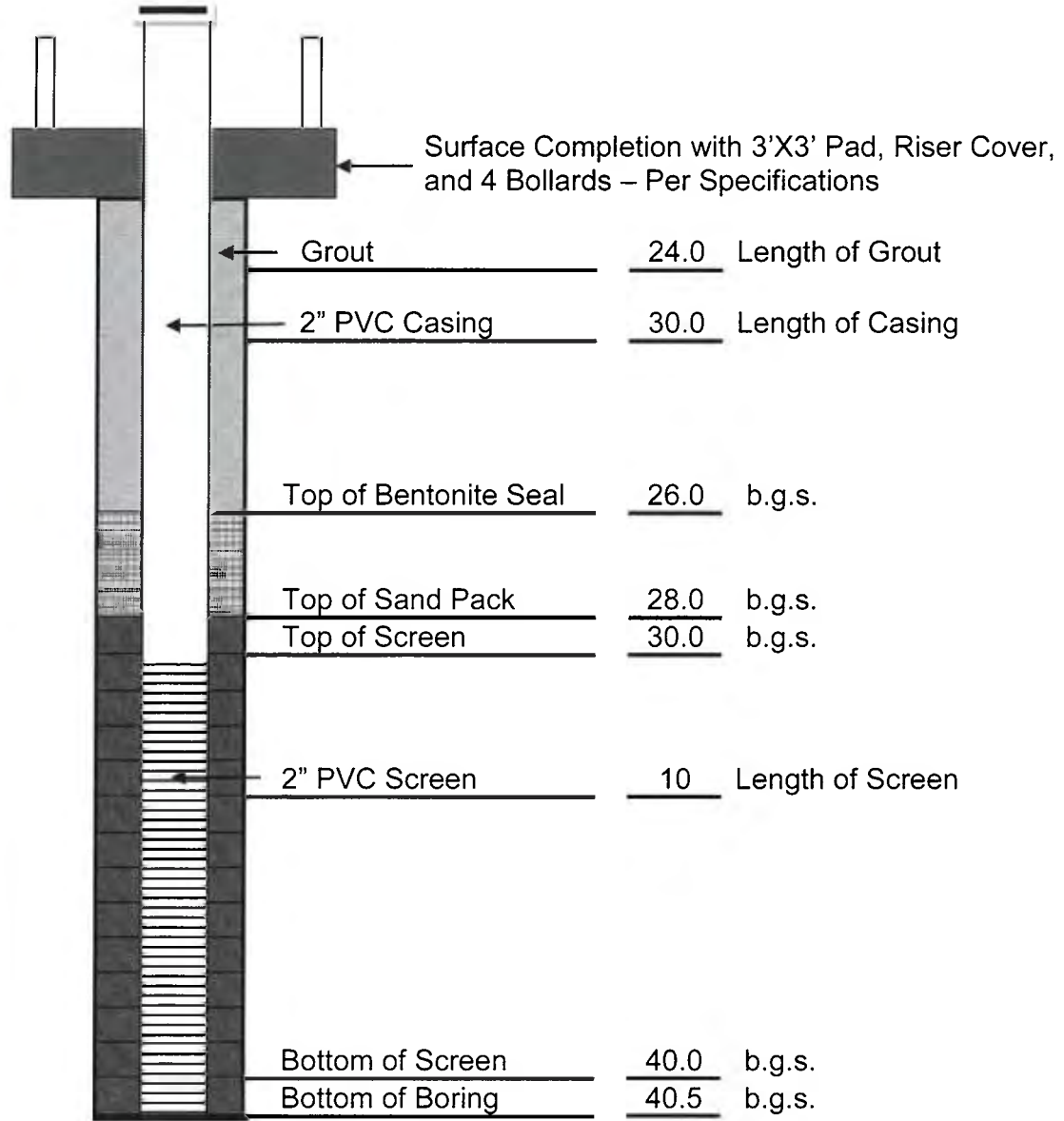
WATER WELLS ONLY	
<b>Estimated well yield</b>	
<b>Well Yield Method</b>	
<b>Well service (# of people served)</b>	
<b>Disinfectant amount</b>	
<b>Disinfectant type</b>	
<b>Pitless adapter installed</b>	
<b>Pump installed</b>	
<b>Depth to intake (ft)</b>	
<b>Apparent quality and odor:</b>	
<b>Appearance</b>	
<b>Odor Type</b>	
<b>Odor-Level</b>	
<b>Coliform Test</b>	
<b>Coliform test type</b>	
<b>Coliform test results</b>	or # colonies per 100 ml
<b>Date Sampled</b>	
<b>Date Analyzed</b>	

For Internal Staff Use Only	
<b>Date Received:</b>	
<b>Date Mapped:</b>	
<b>Mapped By:</b>	

Save For Future Retrieval Submit to DEP

# MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-2996
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-110



Depth to Groundwater	7.0	Total Depth of Boring (ft)	40.5	Total Depth of Well (ft)	40.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	25.0	Drilling in Consolidated	15.5
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk



Comments: Drawing not to scale.

**UNIFORM KENTUCKY WELL CONSTRUCTION RECORD**

Use this form to report installation of monitoring or water wells.

Form must be completed and submitted to the Division of Water within 60 days of well completion.

See instructions below.

One copy to owner and one copy to driller's files.

<b>Owner Name(*)</b>	Big Rivers Electric Corporation		
<b>Owner First Name(*)</b>	NA	<b>Owner Last Name(*)</b>	NA
<b>Owner Address(*)</b>	PO Box 24		
<b>Owner City(*)</b>	Henderson	<b>State(*)</b>	Kentucky
<b>Owner Zip(*)</b>	42419-0024		
<b>Owner Phone(*)</b>	270-844-6031	<b>Owner eMail</b>	

<b>Site Name(*)</b>	D.B. Wilson Station		
<b>Site Address(*)</b>	5633 State Route 85 W		
<b>Site City(*)</b>	Centertown	<b>State(*)</b>	Kentucky
<b>Site Zip(*)</b>	42328		
<b>Site Phone</b>	270-821-7343	<b>Site eMail</b>	

<b>Well Latitude(*)</b>	37.454145	<b>Well Longitude(*)</b>	-87.085061	<b>Method(*)</b>	Paper or Internet Map Interp
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<b>Agency Interest (AI) Number</b>	3319	<b>Facility Type &amp; ID</b>	Solid Waste
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<b>USGS Topo Map(*)</b>	EQUALITY	<b>County(*)</b>	Ohio
<b>Surface elevation (ft)</b>	405.0	<b>Elevation determined by</b>	Topographic map interpolation
<b>Physiographic Region(*)</b>	W. Coal Field	<b>Well Use(*)</b>	Monitoring well - compliance
<b>Drilling Method(*)</b>	Sonic	<b>Well Status(*)</b>	active
<b>Wellhead(*)</b>	Locking Cap	<b>Well Condition(*)</b>	Functioning properly

Casing / Open Borehole					
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Casing diameter (in)(*)	Casing type(*)
Delete	0.0	83.0	6.0	2.0	PVC
Delete	93.0	111.0	6.0	2.0	Open hole
Add New					

Screen						
	From depth (ft)(*)	To depth (ft)(*)	Borehole diameter (in)(*)	Screen diameter (in)(*)	Screen Type(*)	Screen slot size(*)
Delete	83.0	93.0	6.0	2.0	PVC	0.010
Add New						

Annulus fill and seal				
	Section(*)	From depth (ft)(*)	To depth (ft)(*)	Material(*)
Delete	Grout	2.0	79.0	Mixture - bentonite & cement
Delete	Seal	79.0	81.0	Bentonite
Delete	Filter Pack	81.0	95.0	Sand
Delete	Grout	95.0	111.0	Bentonite
Add New				

Lithologic log			
	From depth (ft)(*)	To depth (ft)(*)	Description(*)
Add New			

<b>Site Map/Sketch Map(*)</b>	Choose File No file chosen
<b>Well Diagram (monitoring well)</b>	Choose File No file chosen
<b>Coliform analysis (if applicable)</b>	Choose File No file chosen
<b>Signed variance (if applicable)</b>	Choose File No file chosen
<b>Other laboratory analysis report (if applicable)</b>	Choose File No file chosen
<b>Casing/Screen Supplemental Info</b>	Choose File No file chosen

**Comments** 3'X3' concrete pad w/ 4 bollards.

**Affirmation:** I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. By submitting data, this transmission constitutes my signature and I am responsible for any and all content submitted either by me or by the people I represent.

<b>Signature of certified driller &amp; PIN(*)</b>	Todd W Mills	<b>Date Signed(*)</b>	11/14/2018
<b>Driller First Name(*)</b>	Todd	<b>Driller Last Name(*)</b>	Mills
<b>Certification Number(*)</b>	0344-0454-00	<b>Certification Company(*)</b>	Chase Environmental Group, Inc.

<b>Kentucky Well ID (AKGWA) Number(*)</b>	8007-4811
<b>Owner Well ID</b>	MW-4D
<b>Work Start Date(*)</b>	10/12/2018
<b>Work End Date(*)</b>	10/17/2018
<b>Total depth (ft)(*)</b>	93.0
<b>Depth to bedrock (ft)</b>	93.0
<b>Static water level (ft)</b>	38.0
<b>SWL method(*)</b>	Reported
<b>Casing height above surface (in)</b>	30

WATER WELLS ONLY	
<b>Estimated well yield</b>	
<b>Well Yield Method</b>	
<b>Well service (# of people served)</b>	
<b>Disinfectant amount</b>	
<b>Disinfectant type</b>	
<b>Pitless adapter installed</b>	
<b>Pump installed</b>	
<b>Depth to intake (ft)</b>	
<b>Apparent quality and odor:</b>	
<b>Appearance</b>	
<b>Odor Type</b>	
<b>Odor-Level</b>	
<b>Coliform Test</b>	
<b>Coliform test type</b>	
<b>Coliform test results</b>	# colonies per 100 ml
<b>Date Sampled</b>	
<b>Date Analyzed</b>	

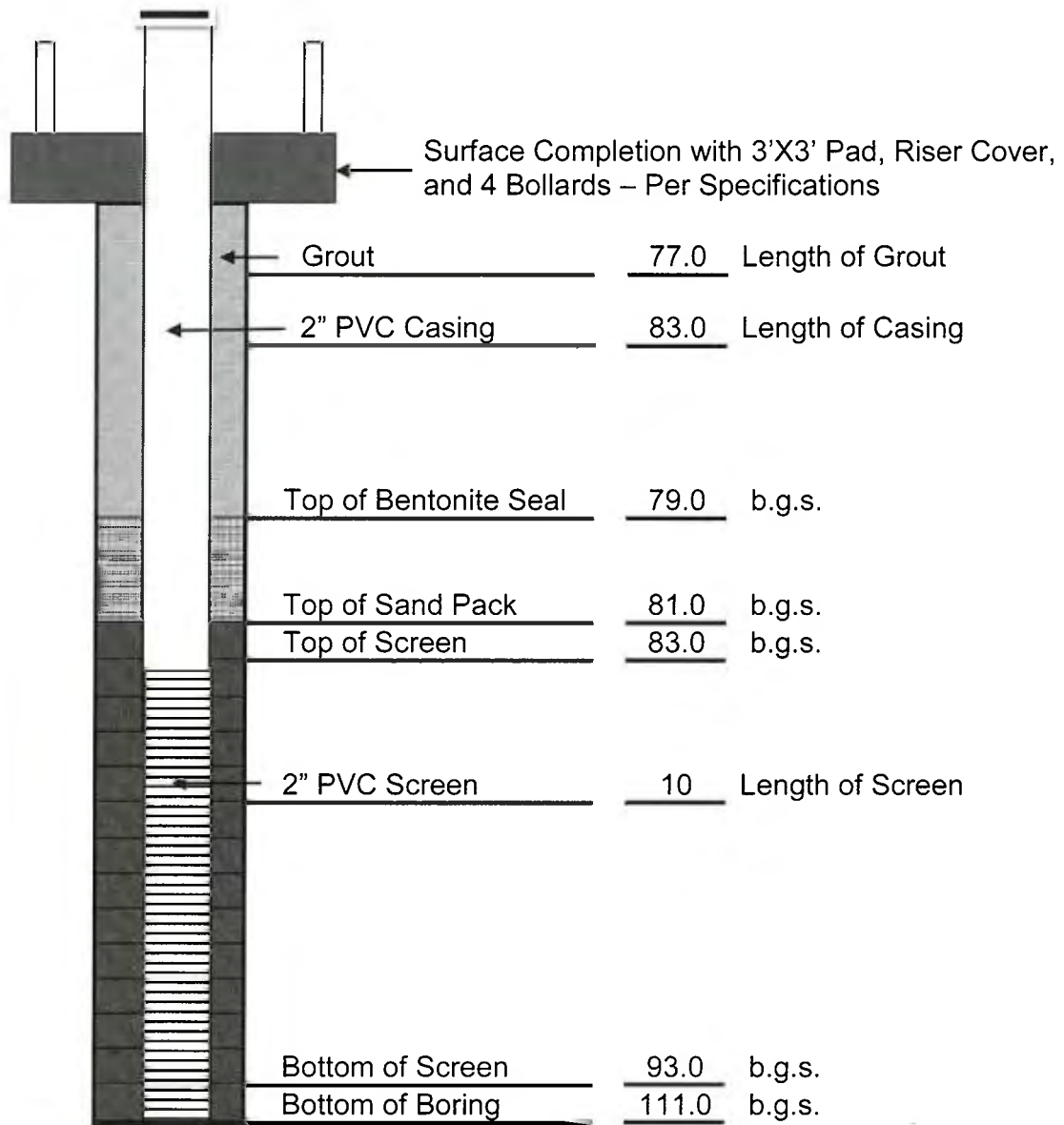
For Internal Staff Use Only	
<b>Date Received:</b>	
<b>Date Mapped:</b>	
<b>Mapped By:</b>	

Save For Future Retrieval Submit to DEP



# MONITORING WELL CONSTRUCTION LOG

Location Name:	BREC D.B. Wilson Station	State Assigned #	8007-4811
Address:	5633 State Route 85 West	AI #	3319
City/State/Zip:	Centertown, KY 42328	Facility Assigned #	MW-4D



Depth to Groundwater	38.0	Total Depth of Boring (ft)	111.0	Total Depth of Well (ft)	93.0	Borehole Diameter	6.0
Well Diameter	2	Slot Size	0.010	Drilling in Unconsolidated	93.0	Drilling in Consolidated	18.0
Date:	10/17/18	Completed By:	Todd W. Mills			Top of Casing	Unk

Ceg CHASE

Environmental Group INC

Comments: Drawing not to scale.

**Appendix C**  
**Analytical Summary Tables**

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

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																											
			4/4/2016		5/20/2016		8/25/2016		10/4/2016		2/15/2017		5/17/2017		8/16/2017		9/28/2017		10/12/2017		4/13/2018		7/12/2018		10/3/2018		6/30/2019		11/6/2019	
			Baseline Events												Assessment		Re-sample		Assessment											
Boron	0.08		0.387	JB	0.282	JB	0.386	J	0.367	JB	0.839	J	0.981	JB	1.17		0.81	J	1.27		0.667	J	0.755	JB	ND	D2 U	ND	D2 U		
Calcium	0.5		673		472		509		464		471	B	514	B	480		493		480	B	504		471		670	D1	541	D1		
Chloride	3		49.3	B	60.2	JB	73.5		89.8		160	B	169	B	180		158	B	261		69.3	B	94.0	B	159	D	98.2	D		
Fluoride	1		ND	J	ND	J	ND		0.838		ND	J	ND	J	ND	JB	ND	J	2.88		ND	J	ND	J	ND	U	ND	U		
Sulfate	5		1630		1950		1670	B	1570	B	1620		1530		2040	B	1860	B	1730	B	1520		1640	B	2060	D	1490	D		
pH (Field Measurement)	0.10		6.59		6.34		7.17		6.93		5.94		6.92		6.77		6.46		7.18		6.67		6.13		6.25		7.3	H3	6.44	
Total Dissolved Solids	10		2840		2960		2940		2930		3000		3100		3220		3090		3040		3210		3200		3440		3290			
<b>APPENDIX IV CONSTITUENTS</b>																														
Antimony	0.002	0.006 mg/L	ND		ND		ND	J	ND	JB	ND		ND	JB	ND	JB	ND	J			ND	JB	ND	J	NA		ND	U	ND	U
Arsenic	0.005	0.01 mg/L	0.00524	J	0.00523		0.00577	B	ND	J	ND	J	ND	JB	ND	J	ND	J			ND	J	ND	J	ND	J	0.0025		0.0023	
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	NA		0.010		0.010	
Beryllium	0.002	0.004 mg/L	ND		ND	J	ND	J	ND	J	ND		ND	J	ND	J	ND				ND		NA		NA		ND	U	ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U
Chromium	0.003	0.1 mg/L	ND		ND	J	0.00309	B	ND	J	ND		ND	J	ND	J	ND				ND	J	ND		NA		ND	U	ND	U
Cobalt	0.005	0.006 mg/L	0.00909	J	0.00829		0.00659		0.00664		0.00518		0.0057		ND	J	0.0051				0.00873		0.00672		0.00660		0.009		0.008	
Fluoride	1	4 mg/L	ND	J	ND	J	ND		0.838		ND	J	ND	J	ND	JB	ND	J			ND	J	ND	J	ND	J	ND	U	ND	U
Lead	0.005	0.015 mg/L	ND		ND		ND	J	ND	JB	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	NA		ND	U	ND	U
Lithium	0.05	0.040 mg/L	0.0243	J	0.0283	J	0.0374	J	0.0338	J	0.0432		0.042	J	0.0489	J	0.0398				0.0370	J	0.0375	J	0.0382	J	0.03		0.03	
Mercury	0.0002	0.002 mg/L	ND		ND		ND		ND		ND		ND		ND		ND				ND		NA		NA		ND	U	ND	U
Molybdenum	0.01	0.1 mg/L	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J	ND	J			ND	J	ND	J	ND	J	0.004	J	0.004	J
Radium 226	1	5 pCi/L	0.645		0.915		0.714		1.19		1.01		0.967		1.22		1.01			0.783		0.711		1.23		1.8		0.434		
Radium 228																														
Selenium	0.01	0.05 mg/L	ND		ND	J	ND	J	ND	J	ND	J	ND	JB	ND	J	ND				ND	J	ND	J	NA		ND	U	ND	U
Thallium	0.001	0.002 mg/L	ND		ND	J	ND		ND	J	ND		ND	J	ND	J	ND				ND		ND		NA		ND	U	ND	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  
 NC = Not Collected  
 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.  
 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  
 U = Target analyte was analyzed for, but was below detection limit

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

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE																
			4/5/2016	5/19/2016	8/25/2016	10/4/2016	2/15/2017	5/18/2017	8/16/2017	9/29/2017	10/12/2017	4/13/2018	7/12/2018	10/4/2018	6/30/2019	11/6/2019			
			Baseline Events										Assessment	Re-sample	Assessment				
Boron	0.08		0.255 JB	0.243 JB	0.27 J	0.228 JB	0.293	0.265 JB	0.298 J	0.328 J	0.286 J			0.250 J	0.272 JB	ND D2 U	ND D2 U		
Calcium	0.5		534	466	470	445	414 B	490 B	477	459	438 B			478 J	426	433 D1	482 D1		
Chloride	3		3.65 B	5.09 B	4.1 B	4.63	4.93	4.37 B	5.49 B	5.36 B	5.6			4.79 B	6.16 B	8.2	16.3		
Fluoride	1		ND J	ND JB	ND	ND	ND J	ND J	ND JB	ND J	2.96			ND J	ND J	ND U	ND U		
Sulfate	5		1560	1710	1660 B	1790 B	1610	1570	1840 B	1630 B	1670 B			1730	1590 B	2040 D	1280 D		
pH (Field Measurement)	0.10		6.40	6.26	6.56	6.64	6.09	6.35	6.36	6.29	6.4		6.15	6.07	6.08	7.01 H3	6.29		
Total Dissolved Solids	10		2740	2780	2790	2800	2620	2820	2950	2900	2920			2920	3050	2700	3170		
<b>APPENDIX IV CONSTITUENTS</b>																			
Antimony	0.002	0.006 mg/L	ND	ND J	ND J	ND JB	ND J	ND JB	ND JB	ND JB	ND JB			ND JB	ND J	NA	ND U	ND U	
Arsenic	0.005	0.01 mg/L	ND J	0.00736	ND JB	0.00534	0.0123	ND B	0.00598	0.00632				ND J	0.00683	0.00592	0.0046	0.0060	
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	NA	0.010	0.012	
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	
Chromium	0.003	0.1 mg/L	ND	ND J	ND B	ND	ND	ND	ND	ND J				ND J	ND	NA	ND U	ND U	
Cobalt	0.005	0.006 mg/L	0.00728 J	0.00713	0.0074	0.00688	0.0054	0.0059	0.00578	0.00686			0.00742	0.00672	0.00666	0.008	0.008		
Fluoride	1	4 mg/L	ND J	ND J	ND	ND	ND J	ND J	ND JB	ND J				ND J	ND J	ND J	ND U	ND U	
Lead	0.005	0.015 mg/L	ND	ND J	ND J	ND JB	ND J	ND J	ND J	ND J				ND J	ND J	NA	ND U	0.0005 J	
Lithium	0.05	0.040 mg/L	0.0326 J	0.0419 J	0.0494 J	0.0459 J	0.0508	0.0455 J	0.0495 J	0.0472 J			0.0470 J	0.0496 J	0.0463 J	0.04	0.04		
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	0.000161 J F1				ND	NA	NA	ND U	ND U	
Molybdenum	0.01	0.1 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J				ND J	ND J	ND J	0.006 J	0.007 J	
Radium 226	1	5 pCi/L	0.596	0.581	0.519	0.847	0.919	0.892	0.82	0.639			0.900	0.795	1.44	0.8	1.42		
Radium 228																			
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND				ND	ND	NA	ND U	ND U	
Thallium	0.001	0.002 mg/L	ND	ND J	ND J	ND J	ND	ND	ND	ND				ND J	ND	NA	ND U	ND 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  
 NC = Not Collected  
 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  
 H3 = Sample received and analyzed past holding time  
 U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY**  
MW-7

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE													
			4/4/2016	5/19/2016	8/25/2016	10/6/2016	2/15/2017	5/18/2017	8/16/2017	9/29/2017	10/12/2017	4/13/2018	7/12/2018	10/4/2018	6/27/2019	11/7/2019
			Baseline Events										Assessment	Re-sample	Assessment	
Boron	0.08		0.241 JB	0.165 JB	0.277 J	0.203 JB	0.293 J	0.232 JB	0.263 J	0.28 J	0.245 J		0.324 J	0.395 JB	1.75 B	1.41 D2
Calcium	0.5		364	241	287	251	262 B	273 B	268	269	259 B		297	271	329	331 D1
Chloride	3		3.47 B	5.31 B	5.67 B	5.65 B	6.15	6.91 B	7.91 B	7.54 B	7.77		17.1 B	21.9 B	32.0	30.1
Fluoride	1		ND J	ND J	ND J	ND J	ND J	ND J	ND JB	ND J	1.43		ND J	ND J	0.222	0.21
Sulfate	5		759	784	813 B	822	850	877	940 B	1780 B	910 B		837	888 B	1030	809 D
pH (Field Measurement)	0.10		6.53	6.29	6.60	7.33	5.60	6.55	6.49	6.32	6.50	6.26	6.18	6.23	7.05 HF	6.59
Total Dissolved Solids	10		1450	1450	1520	1560	1540	1550	1600	1590	1610		1720	1750	1820	1890
<b>APPENDIX IV CONSTITUENTS</b>																
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	ND JB	ND JB		ND JB	ND J	NA	0.000242 JB	ND U
Arsenic	0.005	0.01 mg/L	ND	ND J	ND JB	ND J	ND J	ND JB	ND J	ND J		ND J	ND J	ND J	0.00423 J	0.0034
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	NA	0.0164 JB	0.013
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U
Chromium	0.003	0.1 mg/L	ND	ND J	0.00304 B	ND	ND	ND	ND	ND		ND J	ND	NA	0.0247 B	ND U
Cobalt	0.005	0.006 mg/L	0.0084 J	0.0058	0.0062	0.00483 J	0.00531	0.00358 J	0.00395 J	0.00454 J		0.00468 J	0.00365 J	0.00346 J	0.00236 JB	ND U
Fluoride	1	4 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND JB	ND J		ND J	ND J	ND J	0.222	0.21
Lead	0.005	0.015 mg/L	ND	ND	ND	ND J	ND	ND	ND	ND		ND	ND J	NA	0.000348 J	ND U
Lithium	0.05	0.040 mg/L	0.0241 J	0.0241 J	0.0305 J	0.0263 J	0.0318 J	0.0277 J	0.0291 J	0.0278		0.0261 J	0.0271 J	0.0273 J	0.0323 J	0.02
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND	ND U
Molybdenum	0.01	0.1 mg/L	ND J	ND J	ND J	ND J	ND J	ND J	ND J	ND J		ND J	ND J	ND J	0.0142	0.006 J
Radium 226	1	5 pCi/L	0.727	0.558	0.613	0.66	ND	0.817	0.852	0.779		0.572	0.697	0.935	0.597	0.864
Radium 228																
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	0.000427 J	ND U
Thallium	0.001	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	NA	ND	ND 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  
 NC = Not Collected  
 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.  
 HF = Hold time exceedence

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-8**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE															
			4/4/2016	5/19/2016	8/25/2016	10/3/2016	2/15/2017	5/17/2017	8/15/2017	9/28/2017	10/12/2017	4/13/2018	7/12/2018	10/3/2018	6/30/2019	11/5/2019		
			Baseline Events										Assessment	Re-sample	Assessment			
Boron	0.08		ND JB	ND JB	ND J	ND JB	ND J	ND JB	ND J	ND JB	ND J	ND J	ND J		ND J	0.0388 JB	ND D2 U	ND D2 M2 U
Calcium	0.5		329	242	237	226	213 B	225 B	230	214	216 B		245	207	248 D1	240 D1 M3		
Chloride	3		4.12 B	5.48 B	4.38 B	4.69	4.7	4.19 B	4.68 B	4.82 B	4.44		3.83 B	4.80 B	4.1	4.7		
Fluoride	1		ND J	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J	1.210		ND J	ND J	0.2	0.27		
Sulfate	5		876	910	872 B	854 B	779 B	877	964 B	900 B	894 B		887	799 B	920 D	1480 D		
pH (Field Measurement)	0.10		6.47	6.34	6.64	6.63	4.91	6.47	6.44	6.35	6.50	6.28	6.08	6.25	6.85 H3			
Total Dissolved Solids	10		1530	1590	1550	1520	1450	1560	1590	1520	1560		1690	1560	1640	1570		
<b>APPENDIX IV CONSTITUENTS</b>																		
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	ND JB	ND J			ND JB	ND J	NA	ND U	ND U	
Arsenic	0.005	0.01 mg/L	0.00931 J	0.00698	0.00709 B	0.00581	0.00799	0.0072 B	0.00548	0.00515			0.00525	0.00558	0.00757	0.0054	0.0056	
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	NA	0.024	0.022	
Beryllium	0.002	0.004 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND M2 U	
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	
Chromium	0.003	0.1 mg/L	ND	ND J	ND JB	ND	ND	ND	ND	ND			ND J	ND J	NA	ND U	0.0009 J	
Cobalt	0.005	0.006 mg/L	ND	0.00156 J	0.00118 J	0.0015 J	0.0011 J	0.000739 J	0.000943 J	0.00102 J			0.000800 J	0.00113 J	0.000849 J	ND U	ND U	
Fluoride	1	4 mg/L	ND J	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J			ND J	ND J	ND J	0.2	0.27	
Lead	0.005	0.015 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND J	NA	ND U	0.0005 J	
Lithium	0.05	0.040 mg/L	ND	ND	0.0116 J	0.012 J	0.0142 J	0.0103 J	0.0137 J	ND			ND	0.0125 J	0.0129 J	0.009 J	0.009 J	
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	NA	NA	ND U	ND U	
Molybdenum	0.01	0.1 mg/L	0.0187 J	0.0142	0.0145	0.0151	0.0185	0.0137	0.0166	0.0153			0.0123	0.0129	0.0137	0.01	0.01	
Radium 226	1	5 pCi/L	1.12	1.31	0.741	1.12	0.854	1.07	1.04	0.901			0.802	1.29	1.69	2.8	0.946	
Radium 228																		
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND			ND	ND J	NA	ND U	ND U	
Thallium	0.001	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	NA	ND U	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

NC = Not Collected

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.

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

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

M3 = The accuracy of the spike recovery value is reduced since the analyte concentration in the sample is disproportionate to spike level. The method control sample recovery was acceptable.

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

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-10**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE															
			4/5/2016	5/18/2016	8/25/2016	10/6/2016	2/17/2017	5/18/2017	8/18/2017	10/2/2017	10/13/2017	4/14/2018	7/13/2018	10/5/2018	6/30/2019	11/4/2019		
			Baseline Events										Assessment	Re-sample	Assessment			
Boron	0.08		0.291 JB	0.217 JB	0.205 J	0.166 JB	0.229 J	0.163 JB	0.196 J	0.181 J	0.251 J		0.144 J	0.286 JB	ND D2 U	ND U D2		
Calcium	0.5		497	390	404	369	440 B	390 B	368	379 B	347 B		378 J	334	369 D1	409 D1		
Chloride	3		53.7 B	85.7 JB	53	44 B	44 B	47.4 B	43.5 B	63.3	83		48.2 B	59.2 B	80.1 D	143 D		
Fluoride	1		ND JB	ND J	ND	ND J	ND J	ND JB	ND J	2.8			ND J	ND J	ND U	ND U		
Sulfate	5		2090	2210	2000 B	2030	1980 B	2070	2320 B	2250 B	2080 B		2010	1850 B	2440 D	553 D		
pH (Field Measurement)	0.10		6.03	5.82	6.05	6.91	4.62	5.88	5.83	5.84	6.00	5.90	5.68		6.74 H3			
Total Dissolved Solids	10		2980	3300	3240	3230	3050	3240	3200	3300	3120		3270	3120	2980	2960		
<b>APPENDIX IV CONSTITUENTS</b>																		
Antimony	0.002	0.006 mg/L	ND	ND	ND J	ND JB	ND	ND JB	0.00396 B	ND JB		ND JB	ND J	NA	ND U	ND U		
Arsenic	0.005	0.01 mg/L	ND J	ND J	ND JB	ND J	ND J	ND JB	ND J	ND JB		ND J	ND J	ND J	0.0009 J	0.0025		
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	NA	0.009		
Beryllium	0.002	0.004 mg/L	ND	ND J	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND U		
Cadmium	0.001	0.005 mg/L	ND	ND	ND	ND	ND J	ND J	ND	ND	ND		ND	NA	NA	0.0001 J		
Chromium	0.003	0.1 mg/L	ND	ND J	ND JB	ND	ND	ND	ND	ND	ND J		ND J	ND	NA	ND U		
Cobalt	0.005	0.006 mg/L	0.158	0.113	0.126	0.108	0.0836	0.0602	0.121	0.139		0.0412	0.0704	0.114	0.110	0.108		
Fluoride	1	4 mg/L	ND J	ND J	ND	ND J	ND J	ND J	ND JB	ND J		ND J	ND J	ND J	ND U	ND U		
Lead	0.005	0.015 mg/L	ND	ND J	ND J	ND J	ND J	ND	ND	ND J		ND J	ND J	NA	ND U	ND U		
Lithium	0.05	0.040 mg/L	ND	ND	0.0141 J	0.0149 J	0.0133 J	0.0109 J	0.0129 J	0.0124 J		ND	0.0102 J	0.0147 J	0.009 J	ND U		
Mercury	0.0002	0.002 mg/L	ND	ND	ND	ND	ND	ND	ND	ND		ND	NA	NA	ND U	ND U		
Molybdenum	0.01	0.1 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND		ND	ND	ND	ND U	0.003 J		
Radium 226	1	5 pCi/L	ND	ND	ND	ND	ND	0.384	0.372	0.506		0.721	0.472	0.625	1.2	0.11		
Radium 228																		
Selenium	0.01	0.05 mg/L	ND	ND	ND	ND	ND	ND	ND J	ND JB		ND	ND	NA	ND U	ND U		
Thallium	0.001	0.002 mg/L	ND	ND J	ND J	ND	ND	ND	ND J	ND		ND	ND	NA	ND U	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  
 NC = Not Collected  
 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.  
 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  
 U = Target analyte was analyzed for, but was below detection limit

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-4D**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018		6/28/2019		11/8/2019	
			Characterization					
Boron	0.08		6.60		8.09	D2	9.11	D2
Calcium	0.5		607		635	D1	628	D1
Chloride	3		676	B	826	D	537	D
Fluoride	1		ND	J	ND	DU	0.21	
Sulfate	5		1720	B	1330	D	1100	D
pH (Field Measurement)	0.10		6.05		6.97	H3	6.34	
Total Dissolved Solids	10		4180		4140		3500	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND	JB	ND	U	ND	U
Arsenic	0.005	0.01 mg/L	ND	JB	0.0032		0.0032	
Barium	0.2	2 mg/L	ND	J	0.016		0.016	
Beryllium	0.002	0.004 mg/L	ND	J	ND	U	ND	U
Cadmium	0.001	0.005 mg/L	ND		ND	U	ND	U
Chromium	0.003	0.1 mg/L	0.00591	B	0.0006	J	ND	U
Cobalt	0.005	0.006 mg/L	0.0122		0.010		0.015	
Fluoride	1	4 mg/L	ND	J	ND	DU	0.21	
Lead	0.005	0.015 mg/L	ND	J	ND	U	ND	U
Lithium	0.05	0.040 mg/L	0.181		0.14		0.14	
Mercury	0.0002	0.002 mg/L	ND		ND	U	ND	U
Molybdenum	0.01	0.1 mg/L	0.0185		0.007	J	0.01	
Radium 226	1	5 pCi/L	1.58		2.7		1.86	
Radium 228								
Selenium	0.01	0.05 mg/L	ND	J	0.001	J	0.001	J
Thallium	0.001	0.002 mg/L	ND	J	ND	U	ND	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

NC = Not Collected

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.

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

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



**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-102**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018		6/27/2019		11/8/2019	
			Characterization					
Boron	0.08		ND	J	0.108	JB	ND	D2 M4 U
Calcium	0.5		81.3		80.9		85.1	D2
Chloride	3		33.3	B	33.3		35.3	
Fluoride	1		ND	J	0.343		0.36	
Sulfate	5		265	B	279		307	D
pH (Field Measurement)	0.10		6.58		6.96	HF	6.61	
Total Dissolved Solids	10		781		760		728	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND	JB	0.000101	JB	ND	U
Arsenic	0.005	0.01 mg/L	ND	JB	0.00414	J	0.0031	
Barium	0.2	2 mg/L	ND	J	0.0596	JB	0.059	
Beryllium	0.002	0.004 mg/L	ND		0.000134	J	ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U
Chromium	0.003	0.1 mg/L	0.00321	B	0.00140	JB	0.0006	J
Cobalt	0.005	0.006 mg/L	0.00263	J	0.00286	JB	ND	U
Fluoride	1	4 mg/L	ND	J	0.343		0.36	
Lead	0.005	0.015 mg/L	ND	J	0.000164	J	ND	U
Lithium	0.05	0.040 mg/L	ND		ND		ND	U
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U
Molybdenum	0.01	0.1 mg/L	0.0111		0.00112	J	0.002	J
Radium 226	1	5 pCi/L	1.22		0.187	U	0.425	
Radium 228								
Selenium	0.01	0.05 mg/L	ND		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		ND		ND	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

NC = Not Collected

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.

HF = Hold time exceedence

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-104**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018		6/27/2019		11/8/2019	
			Characterization					
Boron	0.08		ND	J	0.0765	JB	ND	U D2
Calcium	0.5		227		221		257	D1
Chloride	3		11.8	B	12.7		13.2	
Fluoride	1		ND	J	0.129	J	ND	U
Sulfate	5		639	JB	513		587	D M1
pH (Field Measurement)	0.10		6.43		7.32	HF	6.64	
Total Dissolved Solids	10		1410		1360		1490	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND	JB	0.000173	JB	ND	U
Arsenic	0.005	0.01 mg/L	ND	JB	0.00174	J	0.0027	
Barium	0.2	2 mg/L	ND	J	0.0734	JB	0.064	
Beryllium	0.002	0.004 mg/L	ND	J	0.000142	J	ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U
Chromium	0.003	0.1 mg/L	0.00361	B	0.0178	B	0.0037	
Cobalt	0.005	0.006 mg/L	0.00388	J	0.00164	JB	ND	U
Fluoride	1	4 mg/L	ND	J	0.129	J	ND	U
Lead	0.005	0.015 mg/L	ND	J	0.000785	J	0.002	
Lithium	0.05	0.040 mg/L	0.0326	J	0.0261	J	0.03	
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U
Molybdenum	0.01	0.1 mg/L	0.0124		0.00319	J	ND	U
Radium 226	1	5 pCi/L	2.16		0.952		1.24	
Radium 228								
Selenium	0.01	0.05 mg/L	ND		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		ND		ND	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

NC = Not Collected

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

^ = Instrument related QC is outside acceptance limits

HF = Hold time exceedence

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

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018		6/27/2019		11/7/2019	
			Characterization					
Boron	0.08		ND	J	0.348	JB	ND	D2 M4 U
Calcium	0.5		124		58.6		72.0	D2 M1
Chloride	3		10.5	B	9.34		10.1	
Fluoride	1		ND	J	0.638		0.55	
Sulfate	5		216	JB	37.6		73.7	D
pH (Field Measurement)	0.10		6.75		7.84	HF	7.51	
Total Dissolved Solids	10		747		548		612	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND	JB	0.000186	JB	ND	U
Arsenic	0.005	0.01 mg/L	ND	JB	0.00186	J	ND	U
Barium	0.2	2 mg/L	0.207		0.288	B	0.326	
Beryllium	0.002	0.004 mg/L	ND	J	0.000398	J	ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U
Chromium	0.003	0.1 mg/L	0.00388	B	0.00784	B	ND	U
Cobalt	0.005	0.006 mg/L	0.00488	J	0.00435	JB	ND	U
Fluoride	1	4 mg/L	ND	J	0.638		0.55	
Lead	0.005	0.015 mg/L	ND	J	0.00326	J	ND	U
Lithium	0.05	0.040 mg/L	0.0141	J	0.0278	J	0.03	M1
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U
Molybdenum	0.01	0.1 mg/L	0.0131		0.00231	J	0.002	J
Radium 226	1	5 pCi/L	1.08		0.558	U	0.829	
Radium 228								
Selenium	0.01	0.05 mg/L	ND		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		0.0000510	J	ND	U

\*All results listed in milligrams per liter (mg/L) unless otherwise noted by the Maximum Contaminant Level (MCL)

GWPS = Groundwater Protection Standard

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NC = Not Collected

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.

HF = Hold time exceedence

**WILSON LANDFILL - CCR ANALYTICAL SUMMARY  
MW-110**

APPENDIX III CONSTITUENTS	Detection Limit	GWPS	DATE					
			11/2/2018		6/27/2019		11/7/2019	
			Characterization					
Boron	0.08		ND	J	0.0716	JB	ND	U D2
Calcium	0.5		33.8		38.9		47.6	D2
Chloride	3		14.4	B	11.1		10.0	
Fluoride	1		ND	J	0.229		0.23	
Sulfate	5		102	B	70.0		61.2	D
pH (Field Measurement)	0.10		6.93		7.26	HF	6.83	
Total Dissolved Solids	10		333		296		348	
<b>APPENDIX IV CONSTITUENTS</b>								
Antimony	0.002	0.006 mg/L	ND	JB	0.000130	JB	ND	U
Arsenic	0.005	0.01 mg/L	ND	JB	0.00118	J	ND	U
Barium	0.2	2 mg/L	ND	J	0.0535	JB	0.051	
Beryllium	0.002	0.004 mg/L	ND		ND		ND	U
Cadmium	0.001	0.005 mg/L	ND		ND		ND	U
Chromium	0.003	0.1 mg/L	0.00967	B	0.00217	JB	ND	U
Cobalt	0.005	0.006 mg/L	0.00240	J	0.000827	JB	ND	U
Fluoride	1	4 mg/L	ND	J	0.229		0.23	
Lead	0.005	0.015 mg/L	ND	J	0.000539	J	ND	U
Lithium	0.05	0.040 mg/L	0.0122	J	ND		0.006	J
Mercury	0.0002	0.002 mg/L	ND		ND		ND	U
Molybdenum	0.01	0.1 mg/L	ND	J	ND		ND	U
Radium 226	1	5 pCi/L	1.19		0.816		1.10	
Radium 228								
Selenium	0.01	0.05 mg/L	ND		ND		ND	U
Thallium	0.001	0.002 mg/L	ND		ND		ND	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

NC = Not Collected

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.

HF = Hold time exceedence

^ = Instrument related QC is outside acceptance limits

**Appendix D**  
**Analytical Laboratory Reports**

## ANALYTICAL REPORT

Eurofins TestAmerica, Pensacola  
3355 McLemore Drive  
Pensacola, FL 32514  
Tel: (850)474-1001

Laboratory Job ID: 400-172358-1  
Laboratory Sample Delivery Group: D.B. Wilson Station  
Client Project/Site: Semi-Annual

For:  
Big Rivers Electric Corporation  
PO BOX 24  
Henderson, Kentucky 42419

Attn: Mike Galbraith

*Roxanne Cisneros*

Authorized for release by:  
8/21/2019 10:49:00 AM

Roxanne Cisneros, Senior Project Manager  
(615)301-5761  
[roxanne.cisneros@testamericainc.com](mailto:roxanne.cisneros@testamericainc.com)

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	2
Case Narrative . . . . .	3
Detection Summary . . . . .	5
Sample Summary . . . . .	10
Client Sample Results . . . . .	11
Definitions . . . . .	21
QC Association . . . . .	22
QC Sample Results . . . . .	26
Chronicle . . . . .	33
Method Summary . . . . .	41
Certification Summary . . . . .	42
Chain of Custody . . . . .	45
Receipt Checklists . . . . .	47

# Case Narrative

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

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## Job ID: 400-172358-1

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### Laboratory: Eurofins TestAmerica, Pensacola

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#### Narrative

#### Job Narrative 400-172358-1

#### Comments

Revised Report 8/14/2019 to add Zinc per client request.

#### Receipt

The samples were received on 6/28/2019 1:08 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.7° C and 4.0° C.

#### HPLC/IC

Method 9056: Due to the high concentration of Sulfate, the matrix spike / matrix spike duplicate (MS/MSD) for analytical batch 400-446394 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method 9056: The following samples were diluted to bring the concentration of target analytes within the calibration range: MW-102 (400-172358-1), MW-110 (400-172358-3), MW-104 (400-172358-4) and MW-7 (400-172358-5). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

Method 6020A: The continuing calibration verification (CCV) associated with batch 180-285155 recovered above the upper control limit for boron. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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#### Narrative

#### Job Narrative 400-172358-3

#### Comments

No additional comments.

#### Receipt

The samples were received on 6/28/2019 1:08 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.7° C and 4.0° C.

#### RAD

Method(s) 903.0, 9315: Ra-226 Prep Batch 160-433443: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-102 (400-172358-1), MW-105 (400-172358-2), MW-110 (400-172358-3), MW-104 (400-172358-4), MW-7 (400-172358-5), (LCS 160-433443/1-A), (MB 160-433443/23-A), (180-90467-A-2-A) and (180-90467-B-2-A DU)

Method(s) 904.0, 9320: Ra-228 Prep Batch 160-433455: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-102 (400-172358-1), MW-105 (400-172358-2), MW-110 (400-172358-3), MW-104 (400-172358-4), MW-7 (400-172358-5), (LCS 160-433455/1-A), (MB 160-433455/23-A), (180-90467-A-2-B) and (180-90467-B-2-B DU)



# Case Narrative

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

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## Job ID: 400-172358-1 (Continued)

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### Laboratory: Eurofins TestAmerica, Pensacola (Continued)

Method(s) PrecSep\_0: Radium 228 Prep Batch 160-433455: The following samples were prepared at a reduced aliquot due to yellow and brown discoloration: MW-104 (400-172358-4). Sample 480-155414-D-13 was prepared at a reduced aliquot due to limited volume.

Method(s) PrecSep-21: Radium 226 Prep Batch 160-433443: The following samples were prepared at a reduced aliquot due to yellow and brown discoloration: MW-104 (400-172358-4). Sample 480-155414-D-13 was prepared at a reduced aliquot due to limited volume.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Detection Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-102**

**Lab Sample ID: 400-172358-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	33.3		1.00	0.892	mg/L	1		9056	Total/NA
Fluoride	0.343		0.200	0.0820	mg/L	1		9056	Total/NA
Sulfate - DL	279		10.0	7.00	mg/L	10		9056	Total/NA
Antimony	0.000101	J B	0.00200	0.0000213	mg/L	1		6020A	Total Recoverable
Arsenic	0.00414	J	0.00500	0.000118	mg/L	1		6020A	Total Recoverable
Barium	0.0596	J B	0.200	0.000270	mg/L	1		6020A	Total Recoverable
Beryllium	0.000134	J	0.00200	0.000102	mg/L	1		6020A	Total Recoverable
Boron	0.108	J B	1.00	0.00339	mg/L	1		6020A	Total Recoverable
Calcium	80.9		1.00	0.0412	mg/L	1		6020A	Total Recoverable
Chromium	0.00140	J B	0.00300	0.000339	mg/L	1		6020A	Total Recoverable
Cobalt	0.00286	J B	0.00500	0.0000218	mg/L	1		6020A	Total Recoverable
Iron	5880		50.0	14.1	ug/L	1		6020A	Total Recoverable
Lead	0.000164	J	0.00500	0.0000675	mg/L	1		6020A	Total Recoverable
Magnesium	40900		1000	82.7	ug/L	1		6020A	Total Recoverable
Molybdenum	0.00112	J	0.0100	0.000873	mg/L	1		6020A	Total Recoverable
Nickel	2.52	B	1.00	0.312	ug/L	1		6020A	Total Recoverable
Sodium	123000	B	1000	251	ug/L	1		6020A	Total Recoverable
Zinc	0.00362	J	0.00500	0.00322	mg/L	1		6020A	Total Recoverable
pH	6.96	HF			SU	1		9040C	Total/NA
Temperature	24.4	HF			Degrees C	1		9040C	Total/NA
Specific Conductance	1070		5.00	5.00	umhos/cm	1		9050A	Total/NA
Total Organic Carbon	0.727	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 1	0.721	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 2	0.753	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 3	0.732	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 4	0.702	J	1.00	0.500	mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	0.727	J	1.00	0.500	mg/L	1		9060A	Total/NA
Alkalinity, Total	316		1.00	0.980	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	760		10.0	6.80	mg/L	1		SM 2540C	Total/NA

**Client Sample ID: MW-105**

**Lab Sample ID: 400-172358-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.34		1.00	0.892	mg/L	1		9056	Total/NA
Fluoride	0.638		0.200	0.0820	mg/L	1		9056	Total/NA
Sulfate	37.6		1.00	0.700	mg/L	1		9056	Total/NA
Lithium	0.0278	J	0.0500	0.00959	mg/L	1		6010C	Total Recoverable
Antimony	0.000186	J B	0.00200	0.0000213	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

# Detection Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-105 (Continued)**

**Lab Sample ID: 400-172358-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00186	J	0.00500	0.000118	mg/L	1		6020A	Total Recoverable
Barium	0.288	B	0.200	0.000270	mg/L	1		6020A	Total Recoverable
Beryllium	0.000398	J	0.00200	0.000102	mg/L	1		6020A	Total Recoverable
Boron	0.348	J B	1.00	0.00339	mg/L	1		6020A	Total Recoverable
Calcium	58.6		1.00	0.0412	mg/L	1		6020A	Total Recoverable
Chromium	0.00784	B	0.00300	0.000339	mg/L	1		6020A	Total Recoverable
Cobalt	0.00435	J B	0.00500	0.0000218	mg/L	1		6020A	Total Recoverable
Iron	10100		50.0	14.1	ug/L	1		6020A	Total Recoverable
Lead	0.00326	J	0.00500	0.0000675	mg/L	1		6020A	Total Recoverable
Magnesium	22000		1000	82.7	ug/L	1		6020A	Total Recoverable
Molybdenum	0.00231	J	0.0100	0.000873	mg/L	1		6020A	Total Recoverable
Nickel	7.91	B	1.00	0.312	ug/L	1		6020A	Total Recoverable
Sodium	122000	B	1000	251	ug/L	1		6020A	Total Recoverable
Thallium	0.0000510	J	0.00100	0.0000360	mg/L	1		6020A	Total Recoverable
Zinc	0.0161		0.00500	0.00322	mg/L	1		6020A	Total Recoverable
Chemical Oxygen Demand	10.1		10.0	6.40	mg/L	1		410.4	Total/NA
pH	7.84	HF			SU	1		9040C	Total/NA
Temperature	24.8	HF			Degrees C	1		9040C	Total/NA
Specific Conductance	839		5.00	5.00	umhos/cm	1		9050A	Total/NA
Total Organic Carbon	0.792	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 1	0.793	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 2	0.793	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 3	0.791	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 4	0.791	J	1.00	0.500	mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	0.792	J	1.00	0.500	mg/L	1		9060A	Total/NA
Alkalinity, Total	484		1.00	0.980	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	548		5.00	3.40	mg/L	1		SM 2540C	Total/NA

**Client Sample ID: MW-110**

**Lab Sample ID: 400-172358-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	11.1		1.00	0.892	mg/L	1		9056	Total/NA
Fluoride	0.229		0.200	0.0820	mg/L	1		9056	Total/NA
Sulfate - DL	70.0		5.00	3.50	mg/L	5		9056	Total/NA
Antimony	0.000130	J B	0.00200	0.0000213	mg/L	1		6020A	Total Recoverable
Arsenic	0.00118	J	0.00500	0.000118	mg/L	1		6020A	Total Recoverable
Barium	0.0535	J B	0.200	0.000270	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

# Detection Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-110 (Continued)**

**Lab Sample ID: 400-172358-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.0716	J B	1.00	0.00339	mg/L	1		6020A	Total Recoverable
Calcium	38.9		1.00	0.0412	mg/L	1		6020A	Total Recoverable
Chromium	0.00217	J B	0.00300	0.000339	mg/L	1		6020A	Total Recoverable
Cobalt	0.000827	J B	0.00500	0.0000218	mg/L	1		6020A	Total Recoverable
Iron	5130		50.0	14.1	ug/L	1		6020A	Total Recoverable
Lead	0.000539	J	0.00500	0.0000675	mg/L	1		6020A	Total Recoverable
Magnesium	20200		1000	82.7	ug/L	1		6020A	Total Recoverable
Nickel	3.57	B	1.00	0.312	ug/L	1		6020A	Total Recoverable
Sodium	32900	B	1000	251	ug/L	1		6020A	Total Recoverable
Zinc	0.00394	J	0.00500	0.00322	mg/L	1		6020A	Total Recoverable
pH	7.26	HF			SU	1		9040C	Total/NA
Temperature	24.8	HF			Degrees C	1		9040C	Total/NA
Specific Conductance	430		5.00	5.00	umhos/cm	1		9050A	Total/NA
Total Organic Carbon	0.761	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 1	0.797	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 2	0.775	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 3	0.741	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 4	0.733	J	1.00	0.500	mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	0.761	J	1.00	0.500	mg/L	1		9060A	Total/NA
Alkalinity, Total	158		1.00	0.980	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	296		5.00	3.40	mg/L	1		SM 2540C	Total/NA

**Client Sample ID: MW-104**

**Lab Sample ID: 400-172358-4**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	12.7		1.00	0.892	mg/L	1		9056	Total/NA
Fluoride	0.129	J	0.200	0.0820	mg/L	1		9056	Total/NA
Sulfate - DL	513		20.0	14.0	mg/L	20		9056	Total/NA
Lithium	0.0261	J	0.0500	0.00959	mg/L	1		6010C	Total Recoverable
Antimony	0.000173	J B	0.00200	0.0000213	mg/L	1		6020A	Total Recoverable
Arsenic	0.00174	J	0.00500	0.000118	mg/L	1		6020A	Total Recoverable
Barium	0.0734	J B	0.200	0.000270	mg/L	1		6020A	Total Recoverable
Beryllium	0.000142	J	0.00200	0.000102	mg/L	1		6020A	Total Recoverable
Boron	0.0765	J B	1.00	0.00339	mg/L	1		6020A	Total Recoverable
Calcium	221		1.00	0.0412	mg/L	1		6020A	Total Recoverable
Chromium	0.0178	B	0.00300	0.000339	mg/L	1		6020A	Total Recoverable
Cobalt	0.00164	J B	0.00500	0.0000218	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

# Detection Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-104 (Continued)**

**Lab Sample ID: 400-172358-4**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	6280		50.0	14.1	ug/L	1		6020A	Total Recoverable
Lead	0.000785	J	0.00500	0.0000675	mg/L	1		6020A	Total Recoverable
Magnesium	81200		1000	82.7	ug/L	1		6020A	Total Recoverable
Molybdenum	0.00319	J	0.0100	0.000873	mg/L	1		6020A	Total Recoverable
Nickel	3.96	B	1.00	0.312	ug/L	1		6020A	Total Recoverable
Sodium	80400	B	1000	251	ug/L	1		6020A	Total Recoverable
Zinc	0.00600		0.00500	0.00322	mg/L	1		6020A	Total Recoverable
pH	7.32	HF			SU	1		9040C	Total/NA
Temperature	24.8	HF			Degrees C	1		9040C	Total/NA
Specific Conductance	1550		5.00	5.00	umhos/cm	1		9050A	Total/NA
Total Organic Carbon	0.679	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 1	0.708	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 2	0.653	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 3	0.669	J	1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 4	0.686	J	1.00	0.500	mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	0.679	J	1.00	0.500	mg/L	1		9060A	Total/NA
Alkalinity, Total	468		1.00	0.980	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1360		10.0	6.80	mg/L	1		SM 2540C	Total/NA

**Client Sample ID: MW-7**

**Lab Sample ID: 400-172358-5**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	32.0		1.00	0.892	mg/L	1		9056	Total/NA
Fluoride	0.222		0.200	0.0820	mg/L	1		9056	Total/NA
Sulfate - DL	1030		50.0	35.0	mg/L	50		9056	Total/NA
Lithium	0.0323	J	0.0500	0.00959	mg/L	1		6010C	Total Recoverable
Antimony	0.000242	J B	0.00200	0.0000213	mg/L	1		6020A	Total Recoverable
Arsenic	0.00423	J	0.00500	0.000118	mg/L	1		6020A	Total Recoverable
Barium	0.0164	J B	0.200	0.000270	mg/L	1		6020A	Total Recoverable
Boron	1.75	B	1.00	0.00339	mg/L	1		6020A	Total Recoverable
Calcium	329		1.00	0.0412	mg/L	1		6020A	Total Recoverable
Chromium	0.0247	B	0.00300	0.000339	mg/L	1		6020A	Total Recoverable
Cobalt	0.00236	J B	0.00500	0.0000218	mg/L	1		6020A	Total Recoverable
Iron	7860		50.0	14.1	ug/L	1		6020A	Total Recoverable
Lead	0.000348	J	0.00500	0.0000675	mg/L	1		6020A	Total Recoverable
Magnesium	133000		1000	82.7	ug/L	1		6020A	Total Recoverable
Molybdenum	0.0142		0.0100	0.000873	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

# Detection Summary

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

**Client Sample ID: MW-7 (Continued)**

**Lab Sample ID: 400-172358-5**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Nickel	7.22	B	1.00	0.312	ug/L	1		6020A	Total Recoverable
Selenium	0.000427	J	0.0100	0.000348	mg/L	1		6020A	Total Recoverable
Sodium	36100	B	1000	251	ug/L	1		6020A	Total Recoverable
Zinc	0.00484	J	0.00500	0.00322	mg/L	1		6020A	Total Recoverable
pH	7.05	HF			SU	1		9040C	Total/NA
Temperature	24.5	HF			Degrees C	1		9040C	Total/NA
Specific Conductance	1990		5.00	5.00	umhos/cm	1		9050A	Total/NA
Total Organic Carbon	1.25		1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 1	1.25		1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 2	1.27		1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 3	1.24		1.00	0.500	mg/L	1		9060A	Total/NA
TOC Result 4	1.23		1.00	0.500	mg/L	1		9060A	Total/NA
Total Organic Carbon - Quad	1.25		1.00	0.500	mg/L	1		9060A	Total/NA
Alkalinity, Total	320		1.00	0.980	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1820		10.0	6.80	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Pensacola

# Sample Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
400-172358-1	MW-102	Water	06/27/19 09:10	06/28/19 13:08	
400-172358-2	MW-105	Water	06/27/19 10:51	06/28/19 13:08	
400-172358-3	MW-110	Water	06/27/19 12:25	06/28/19 13:08	
400-172358-4	MW-104	Water	06/27/19 13:55	06/28/19 13:08	
400-172358-5	MW-7	Water	06/27/19 15:10	06/28/19 13:08	

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# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-102**

**Lab Sample ID: 400-172358-1**

Date Collected: 06/27/19 09:10

Matrix: Water

Date Received: 06/28/19 13:08

### Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	33.3		1.00	0.892	mg/L			07/01/19 12:21	1
Fluoride	0.343		0.200	0.0820	mg/L			07/01/19 12:21	1

### Method: 9056 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	279		10.0	7.00	mg/L			07/02/19 16:27	10

### Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:26	1

### Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000101	J B	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 13:48	1
Arsenic	0.00414	J	0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 13:48	1
Barium	0.0596	J B	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 13:48	1
Beryllium	0.000134	J	0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 13:48	1
Boron	0.108	J B	1.00	0.00339	mg/L		07/16/19 12:33	07/18/19 12:20	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 13:48	1
Calcium	80.9		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 13:48	1
Chromium	0.00140	J B	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 13:48	1
Cobalt	0.00286	J B	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 13:48	1
Iron	5880		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 13:48	1
Lead	0.000164	J	0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 13:48	1
Magnesium	40900		1000	82.7	ug/L		07/16/19 12:33	07/17/19 13:48	1
Molybdenum	0.00112	J	0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 13:48	1
Nickel	2.52	B	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 13:48	1
Selenium	ND		0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 13:48	1
Sodium	123000	B	1000	251	ug/L		07/16/19 12:33	07/17/19 13:48	1
Thallium	ND		0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 13:48	1
Zinc	0.00362	J	0.00500	0.00322	mg/L		07/16/19 12:33	07/17/19 13:48	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:03	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	6.40	mg/L			07/11/19 14:05	1
pH	6.96	HF			SU			06/29/19 22:17	1
Temperature	24.4	HF			Degrees C			06/29/19 22:17	1
Specific Conductance	1070		5.00	5.00	umhos/cm			06/29/19 19:57	1
Total Organic Carbon	0.727	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	0.721	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	0.753	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	0.732	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 4	0.702	J	1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	0.727	J	1.00	0.500	mg/L			06/29/19 10:28	1
Alkalinity, Total	316		1.00	0.980	mg/L			07/01/19 12:42	1
Total Dissolved Solids	760		10.0	6.80	mg/L			07/02/19 15:23	1

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# Client Sample Results

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

**Client Sample ID: MW-102**

**Lab Sample ID: 400-172358-1**

Date Collected: 06/27/19 09:10

Matrix: Water

Date Received: 06/28/19 13:08

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.135	U	0.247	0.247	1.00	0.431	pCi/L	07/02/19 12:58	08/19/19 16:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.6		40 - 110					07/02/19 12:58	08/19/19 16:03	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0521	U	0.215	0.215	1.00	0.379	pCi/L	07/02/19 14:27	08/19/19 09:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.6		40 - 110					07/02/19 14:27	08/19/19 09:07	1
Y Carrier	92.3		40 - 110					07/02/19 14:27	08/19/19 09:07	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.187	U	0.327	0.327	5.00	0.431	pCi/L		08/21/19 08:52	1

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-105**

**Lab Sample ID: 400-172358-2**

Date Collected: 06/27/19 10:51

Matrix: Water

Date Received: 06/28/19 13:08

**Method: 9056 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.34		1.00	0.892	mg/L			07/01/19 13:30	1
Fluoride	0.638		0.200	0.0820	mg/L			07/01/19 13:30	1
Sulfate	37.6		1.00	0.700	mg/L			07/01/19 13:30	1

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0278	J	0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:31	1

**Method: 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000186	J B	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 13:51	1
Arsenic	0.00186	J	0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 13:51	1
Barium	0.288	B	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 13:51	1
Beryllium	0.000398	J	0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 13:51	1
Boron	0.348	J B	1.00	0.00339	mg/L		07/16/19 12:33	07/18/19 12:23	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 13:51	1
Calcium	58.6		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 13:51	1
Chromium	0.00784	B	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 13:51	1
Cobalt	0.00435	J B	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 13:51	1
Iron	10100		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 13:51	1
Lead	0.00326	J	0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 13:51	1
Magnesium	22000		1000	82.7	ug/L		07/16/19 12:33	07/17/19 13:51	1
Molybdenum	0.00231	J	0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 13:51	1
Nickel	7.91	B	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 13:51	1
Selenium	ND		0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 13:51	1
Sodium	122000	B	1000	251	ug/L		07/16/19 12:33	07/17/19 13:51	1
Thallium	0.0000510	J	0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 13:51	1
Zinc	0.0161		0.00500	0.00322	mg/L		07/16/19 12:33	07/17/19 13:51	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:05	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	10.1		10.0	6.40	mg/L			07/11/19 14:05	1
pH	7.84	HF			SU			06/29/19 22:17	1
Temperature	24.8	HF			Degrees C			06/29/19 22:17	1
Specific Conductance	839		5.00	5.00	umhos/cm			06/29/19 19:57	1
Total Organic Carbon	0.792	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	0.793	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	0.793	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	0.791	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 4	0.791	J	1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	0.792	J	1.00	0.500	mg/L			06/29/19 10:28	1
Alkalinity, Total	484		1.00	0.980	mg/L			07/01/19 12:51	1
Total Dissolved Solids	548		5.00	3.40	mg/L			07/02/19 15:23	1

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-105**

**Lab Sample ID: 400-172358-2**

Date Collected: 06/27/19 10:51

Matrix: Water

Date Received: 06/28/19 13:08

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0989	U	0.323	0.323	1.00	0.614	pCi/L	07/02/19 12:58	08/19/19 16:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.3		40 - 110					07/02/19 12:58	08/19/19 16:03	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.460	U	0.526	0.527	1.00	0.865	pCi/L	07/02/19 14:27	08/19/19 09:07	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.3		40 - 110					07/02/19 14:27	08/19/19 09:07	1
Y Carrier	84.9		40 - 110					07/02/19 14:27	08/19/19 09:07	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.558	U	0.617	0.618	5.00	0.865	pCi/L		08/21/19 08:52	1

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-110**

**Lab Sample ID: 400-172358-3**

Date Collected: 06/27/19 12:25

Matrix: Water

Date Received: 06/28/19 13:08

### Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	11.1		1.00	0.892	mg/L			07/01/19 13:53	1
Fluoride	0.229		0.200	0.0820	mg/L			07/01/19 13:53	1

### Method: 9056 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	70.0		5.00	3.50	mg/L			07/02/19 16:50	5

### Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:36	1

### Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000130	J B	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 13:58	1
Arsenic	0.00118	J	0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 13:58	1
Barium	0.0535	J B	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 13:58	1
Beryllium	ND		0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 13:58	1
Boron	0.0716	J B	1.00	0.00339	mg/L		07/16/19 12:33	07/18/19 12:26	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 13:58	1
Calcium	38.9		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 13:58	1
Chromium	0.00217	J B	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 13:58	1
Cobalt	0.000827	J B	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 13:58	1
Iron	5130		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 13:58	1
Lead	0.000539	J	0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 13:58	1
Magnesium	20200		1000	82.7	ug/L		07/16/19 12:33	07/17/19 13:58	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 13:58	1
Nickel	3.57	B	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 13:58	1
Selenium	ND		0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 13:58	1
Sodium	32900	B	1000	251	ug/L		07/16/19 12:33	07/17/19 13:58	1
Thallium	ND		0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 13:58	1
Zinc	0.00394	J	0.00500	0.00322	mg/L		07/16/19 12:33	07/17/19 13:58	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:06	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	6.40	mg/L			07/11/19 14:05	1
pH	7.26	HF			SU			06/29/19 22:17	1
Temperature	24.8	HF			Degrees C			06/29/19 22:17	1
Specific Conductance	430		5.00	5.00	umhos/cm			06/29/19 19:57	1
Total Organic Carbon	0.761	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	0.797	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	0.775	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	0.741	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 4	0.733	J	1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	0.761	J	1.00	0.500	mg/L			06/29/19 10:28	1
Alkalinity, Total	158		1.00	0.980	mg/L			07/01/19 12:56	1
Total Dissolved Solids	296		5.00	3.40	mg/L			07/02/19 15:23	1

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# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-110**

**Lab Sample ID: 400-172358-3**

Date Collected: 06/27/19 12:25

Matrix: Water

Date Received: 06/28/19 13:08

### Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.275	U	0.209	0.211	1.00	0.297	pCi/L	07/02/19 12:58	08/19/19 16:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.9		40 - 110					07/02/19 12:58	08/19/19 16:05	1

### Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.541		0.276	0.280	1.00	0.405	pCi/L	07/02/19 14:27	08/19/19 09:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.9		40 - 110					07/02/19 14:27	08/19/19 09:08	1
Y Carrier	84.9		40 - 110					07/02/19 14:27	08/19/19 09:08	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.816		0.346	0.351	5.00	0.405	pCi/L		08/21/19 08:52	1

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-104**

**Lab Sample ID: 400-172358-4**

Date Collected: 06/27/19 13:55

Matrix: Water

Date Received: 06/28/19 13:08

**Method: 9056 - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	12.7		1.00	0.892	mg/L			07/01/19 14:16	1
Fluoride	0.129	J	0.200	0.0820	mg/L			07/01/19 14:16	1

**Method: 9056 - Anions, Ion Chromatography - DL**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	513		20.0	14.0	mg/L			07/02/19 17:13	20

**Method: 6010C - Metals (ICP) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0261	J	0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:42	1

**Method: 6020A - Metals (ICP/MS) - Total Recoverable**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000173	J B	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 14:02	1
Arsenic	0.00174	J	0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 14:02	1
Barium	0.0734	J B	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 14:02	1
Beryllium	0.000142	J	0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 14:02	1
Boron	0.0765	J B	1.00	0.00339	mg/L		07/16/19 12:33	07/18/19 12:30	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 14:02	1
Calcium	221		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 14:02	1
Chromium	0.0178	B	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 14:02	1
Cobalt	0.00164	J B	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 14:02	1
Iron	6280		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 14:02	1
Lead	0.000785	J	0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 14:02	1
Magnesium	81200		1000	82.7	ug/L		07/16/19 12:33	07/17/19 14:02	1
Molybdenum	0.00319	J	0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 14:02	1
Nickel	3.96	B	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 14:02	1
Selenium	ND		0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 14:02	1
Sodium	80400	B	1000	251	ug/L		07/16/19 12:33	07/17/19 14:02	1
Thallium	ND		0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 14:02	1
Zinc	0.00600		0.00500	0.00322	mg/L		07/16/19 12:33	07/17/19 14:02	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:07	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	6.40	mg/L			07/11/19 14:05	1
pH	7.32	HF			SU			06/29/19 22:17	1
Temperature	24.8	HF			Degrees C			06/29/19 22:17	1
Specific Conductance	1550		5.00	5.00	umhos/cm			06/29/19 19:57	1
Total Organic Carbon	0.679	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	0.708	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	0.653	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	0.669	J	1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 4	0.686	J	1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	0.679	J	1.00	0.500	mg/L			06/29/19 10:28	1
Alkalinity, Total	468		1.00	0.980	mg/L			07/01/19 13:14	1
Total Dissolved Solids	1360		10.0	6.80	mg/L			07/02/19 15:23	1

Eurofins TestAmerica, Pensacola

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-104**

**Lab Sample ID: 400-172358-4**

Date Collected: 06/27/19 13:55

Matrix: Water

Date Received: 06/28/19 13:08

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.343	U	0.307	0.308	1.00	0.466	pCi/L	07/02/19 12:58	08/19/19 16:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					07/02/19 12:58	08/19/19 16:04	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.610		0.365	0.369	1.00	0.550	pCi/L	07/02/19 14:27	08/19/19 09:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110					07/02/19 14:27	08/19/19 09:08	1
Y Carrier	86.4		40 - 110					07/02/19 14:27	08/19/19 09:08	1

**Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.952		0.477	0.481	5.00	0.550	pCi/L		08/21/19 08:52	1

# Client Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-7**  
Date Collected: 06/27/19 15:10  
Date Received: 06/28/19 13:08

**Lab Sample ID: 400-172358-5**  
Matrix: Water

### Method: 9056 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	32.0		1.00	0.892	mg/L			07/01/19 14:38	1
Fluoride	0.222		0.200	0.0820	mg/L			07/01/19 14:38	1

### Method: 9056 - Anions, Ion Chromatography - DL

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1030		50.0	35.0	mg/L			07/02/19 18:21	50

### Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	0.0323	J	0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:47	1

### Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.000242	J B	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 14:05	1
Arsenic	0.00423	J	0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 14:05	1
Barium	0.0164	J B	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 14:05	1
Beryllium	ND		0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 14:05	1
Boron	1.75	B	1.00	0.00339	mg/L		07/16/19 12:33	07/18/19 12:33	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 14:05	1
Calcium	329		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 14:05	1
Chromium	0.0247	B	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 14:05	1
Cobalt	0.00236	J B	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 14:05	1
Iron	7860		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 14:05	1
Lead	0.000348	J	0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 14:05	1
Magnesium	133000		1000	82.7	ug/L		07/16/19 12:33	07/17/19 14:05	1
Molybdenum	0.0142		0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 14:05	1
Nickel	7.22	B	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 14:05	1
Selenium	0.000427	J	0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 14:05	1
Sodium	36100	B	1000	251	ug/L		07/16/19 12:33	07/17/19 14:05	1
Thallium	ND		0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 14:05	1
Zinc	0.00484	J	0.00500	0.00322	mg/L		07/16/19 12:33	07/17/19 14:05	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:08	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	6.40	mg/L			07/11/19 14:05	1
pH	7.05	HF			SU			06/29/19 22:17	1
Temperature	24.5	HF			Degrees C			06/29/19 22:17	1
Specific Conductance	1990		5.00	5.00	umhos/cm			06/29/19 19:57	1
Total Organic Carbon	1.25		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	1.25		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	1.27		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	1.24		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 4	1.23		1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	1.25		1.00	0.500	mg/L			06/29/19 10:28	1
Alkalinity, Total	320		1.00	0.980	mg/L			07/01/19 13:29	1
Total Dissolved Solids	1820		10.0	6.80	mg/L			07/02/19 16:42	1



# Client Sample Results

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

**Client Sample ID: MW-7**  
**Date Collected: 06/27/19 15:10**  
**Date Received: 06/28/19 13:08**

**Lab Sample ID: 400-172358-5**  
**Matrix: Water**

### Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.235	U	0.208	0.209	1.00	0.313	pCi/L	07/02/19 12:58	08/19/19 16:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.0		40 - 110					07/02/19 12:58	08/19/19 16:03	1

### Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.362	U	0.259	0.261	1.00	0.403	pCi/L	07/02/19 14:27	08/19/19 09:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.0		40 - 110					07/02/19 14:27	08/19/19 09:08	1
Y Carrier	84.9		40 - 110					07/02/19 14:27	08/19/19 09:08	1

### Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.597		0.332	0.334	5.00	0.403	pCi/L		08/21/19 08:52	1

# Definitions/Glossary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
♠	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Association Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## HPLC/IC

### Analysis Batch: 446394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	9056	
400-172358-2	MW-105	Total/NA	Water	9056	
400-172358-3	MW-110	Total/NA	Water	9056	
400-172358-4	MW-104	Total/NA	Water	9056	
400-172358-5	MW-7	Total/NA	Water	9056	
MB 400-446394/4	Method Blank	Total/NA	Water	9056	
LCS 400-446394/5	Lab Control Sample	Total/NA	Water	9056	
LCSD 400-446394/6	Lab Control Sample Dup	Total/NA	Water	9056	
400-172358-1 MS	MW-102	Total/NA	Water	9056	
400-172358-1 MSD	MW-102	Total/NA	Water	9056	

### Analysis Batch: 446646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1 - DL	MW-102	Total/NA	Water	9056	
400-172358-3 - DL	MW-110	Total/NA	Water	9056	
400-172358-4 - DL	MW-104	Total/NA	Water	9056	
400-172358-5 - DL	MW-7	Total/NA	Water	9056	
MB 400-446646/4	Method Blank	Total/NA	Water	9056	
LCS 400-446646/5	Lab Control Sample	Total/NA	Water	9056	
LCSD 400-446646/6	Lab Control Sample Dup	Total/NA	Water	9056	

## Metals

### Prep Batch: 284352

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	7470A	
400-172358-2	MW-105	Total/NA	Water	7470A	
400-172358-3	MW-110	Total/NA	Water	7470A	
400-172358-4	MW-104	Total/NA	Water	7470A	
400-172358-5	MW-7	Total/NA	Water	7470A	
MB 180-284352/1-A	Method Blank	Total/NA	Water	7470A	
LCS 180-284352/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 284460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	7470A	284352
400-172358-2	MW-105	Total/NA	Water	7470A	284352
400-172358-3	MW-110	Total/NA	Water	7470A	284352
400-172358-4	MW-104	Total/NA	Water	7470A	284352
400-172358-5	MW-7	Total/NA	Water	7470A	284352
MB 180-284352/1-A	Method Blank	Total/NA	Water	7470A	284352
LCS 180-284352/2-A	Lab Control Sample	Total/NA	Water	7470A	284352

### Prep Batch: 284931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total Recoverable	Water	3005A	
400-172358-2	MW-105	Total Recoverable	Water	3005A	
400-172358-3	MW-110	Total Recoverable	Water	3005A	
400-172358-4	MW-104	Total Recoverable	Water	3005A	
400-172358-5	MW-7	Total Recoverable	Water	3005A	
MB 180-284931/1-A	Method Blank	Total Recoverable	Water	3005A	

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# QC Association Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Metals (Continued)

### Prep Batch: 284931 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 180-284931/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Prep Batch: 284933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total Recoverable	Water	3005A	
400-172358-2	MW-105	Total Recoverable	Water	3005A	
400-172358-3	MW-110	Total Recoverable	Water	3005A	
400-172358-4	MW-104	Total Recoverable	Water	3005A	
400-172358-5	MW-7	Total Recoverable	Water	3005A	
MB 180-284933/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 180-284933/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 285066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total Recoverable	Water	6010C	284931
400-172358-2	MW-105	Total Recoverable	Water	6010C	284931
400-172358-3	MW-110	Total Recoverable	Water	6010C	284931
400-172358-4	MW-104	Total Recoverable	Water	6010C	284931
400-172358-5	MW-7	Total Recoverable	Water	6010C	284931
MB 180-284931/1-A	Method Blank	Total Recoverable	Water	6010C	284931
LCS 180-284931/2-A	Lab Control Sample	Total Recoverable	Water	6010C	284931

### Analysis Batch: 285155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total Recoverable	Water	6020A	284933
400-172358-2	MW-105	Total Recoverable	Water	6020A	284933
400-172358-3	MW-110	Total Recoverable	Water	6020A	284933
400-172358-4	MW-104	Total Recoverable	Water	6020A	284933
400-172358-5	MW-7	Total Recoverable	Water	6020A	284933
MB 180-284933/1-A	Method Blank	Total Recoverable	Water	6020A	284933
LCS 180-284933/2-A	Lab Control Sample	Total Recoverable	Water	6020A	284933

### Analysis Batch: 285296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total Recoverable	Water	6020A	284933
400-172358-2	MW-105	Total Recoverable	Water	6020A	284933
400-172358-3	MW-110	Total Recoverable	Water	6020A	284933
400-172358-4	MW-104	Total Recoverable	Water	6020A	284933
400-172358-5	MW-7	Total Recoverable	Water	6020A	284933

## General Chemistry

### Analysis Batch: 446304

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	9050A	
400-172358-2	MW-105	Total/NA	Water	9050A	
400-172358-3	MW-110	Total/NA	Water	9050A	
400-172358-4	MW-104	Total/NA	Water	9050A	
400-172358-5	MW-7	Total/NA	Water	9050A	
MB 400-446304/1	Method Blank	Total/NA	Water	9050A	
LCS 400-446304/2	Lab Control Sample	Total/NA	Water	9050A	

# QC Association Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## General Chemistry

### Analysis Batch: 446307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	9040C	
400-172358-2	MW-105	Total/NA	Water	9040C	
400-172358-3	MW-110	Total/NA	Water	9040C	
400-172358-4	MW-104	Total/NA	Water	9040C	
400-172358-5	MW-7	Total/NA	Water	9040C	
LCS 400-446307/4	Lab Control Sample	Total/NA	Water	9040C	

### Analysis Batch: 446416

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	SM 2320B	
400-172358-2	MW-105	Total/NA	Water	SM 2320B	
400-172358-3	MW-110	Total/NA	Water	SM 2320B	
400-172358-4	MW-104	Total/NA	Water	SM 2320B	
400-172358-5	MW-7	Total/NA	Water	SM 2320B	
MB 400-446416/4	Method Blank	Total/NA	Water	SM 2320B	
LCS 400-446416/5	Lab Control Sample	Total/NA	Water	SM 2320B	
400-172358-4 DU	MW-104	Total/NA	Water	SM 2320B	

### Analysis Batch: 446594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	SM 2540C	
400-172358-2	MW-105	Total/NA	Water	SM 2540C	
400-172358-3	MW-110	Total/NA	Water	SM 2540C	
400-172358-4	MW-104	Total/NA	Water	SM 2540C	
MB 400-446594/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 400-446594/2	Lab Control Sample	Total/NA	Water	SM 2540C	
400-172358-4 DU	MW-104	Total/NA	Water	SM 2540C	

### Analysis Batch: 446609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-5	MW-7	Total/NA	Water	SM 2540C	
MB 400-446609/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 400-446609/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 447375

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	9060A	
400-172358-2	MW-105	Total/NA	Water	9060A	
400-172358-3	MW-110	Total/NA	Water	9060A	
400-172358-4	MW-104	Total/NA	Water	9060A	
400-172358-5	MW-7	Total/NA	Water	9060A	
MB 400-447375/3	Method Blank	Total/NA	Water	9060A	
LCS 400-447375/5	Lab Control Sample	Total/NA	Water	9060A	

### Analysis Batch: 447589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	410.4	
400-172358-2	MW-105	Total/NA	Water	410.4	
400-172358-3	MW-110	Total/NA	Water	410.4	
400-172358-4	MW-104	Total/NA	Water	410.4	
400-172358-5	MW-7	Total/NA	Water	410.4	

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# QC Association Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## General Chemistry (Continued)

### Analysis Batch: 447589 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 400-447589/4	Method Blank	Total/NA	Water	410.4	
LCS 400-447589/5	Lab Control Sample	Total/NA	Water	410.4	
400-172358-1 MS	MW-102	Total/NA	Water	410.4	
400-172358-1 MSD	MW-102	Total/NA	Water	410.4	

## Rad

### Prep Batch: 433443

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	PrecSep-21	
400-172358-2	MW-105	Total/NA	Water	PrecSep-21	
400-172358-3	MW-110	Total/NA	Water	PrecSep-21	
400-172358-4	MW-104	Total/NA	Water	PrecSep-21	
400-172358-5	MW-7	Total/NA	Water	PrecSep-21	
MB 160-433443/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-433443/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 433455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-172358-1	MW-102	Total/NA	Water	PrecSep_0	
400-172358-2	MW-105	Total/NA	Water	PrecSep_0	
400-172358-3	MW-110	Total/NA	Water	PrecSep_0	
400-172358-4	MW-104	Total/NA	Water	PrecSep_0	
400-172358-5	MW-7	Total/NA	Water	PrecSep_0	
MB 160-433455/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-433455/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: 9056 - Anions, Ion Chromatography

**Lab Sample ID: MB 400-446394/4**  
**Matrix: Water**  
**Analysis Batch: 446394**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.892	mg/L			07/01/19 11:11	1
Fluoride	ND		0.200	0.0820	mg/L			07/01/19 11:11	1
Sulfate	ND		1.00	0.700	mg/L			07/01/19 11:11	1

**Lab Sample ID: LCS 400-446394/5**  
**Matrix: Water**  
**Analysis Batch: 446394**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.543		mg/L		95	90 - 110
Fluoride	10.0	9.881		mg/L		99	90 - 110
Sulfate	10.0	10.14		mg/L		101	90 - 110

**Lab Sample ID: LCSD 400-446394/6**  
**Matrix: Water**  
**Analysis Batch: 446394**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.531		mg/L		95	90 - 110	0	15
Fluoride	10.0	9.768		mg/L		98	90 - 110	1	15
Sulfate	10.0	10.08		mg/L		101	90 - 110	1	15

**Lab Sample ID: 400-172358-1 MS**  
**Matrix: Water**  
**Analysis Batch: 446394**

**Client Sample ID: MW-102**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	33.3		10.0	42.64		mg/L		94	80 - 120
Fluoride	0.343		10.0	10.07		mg/L		97	80 - 120
Sulfate	NQ	F1	10.0	NQ	F1	mg/L		0	80 - 120

**Lab Sample ID: 400-172358-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 446394**

**Client Sample ID: MW-102**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	33.3		10.0	42.36		mg/L		91	80 - 120	1	20
Fluoride	0.343		10.0	10.01		mg/L		97	80 - 120	1	20
Sulfate	NQ	F1	10.0	NQ	F1	mg/L		0	80 - 120	NC	20

**Lab Sample ID: MB 400-446646/4**  
**Matrix: Water**  
**Analysis Batch: 446646**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		1.00	0.892	mg/L			07/02/19 10:52	1
Fluoride	ND		0.200	0.0820	mg/L			07/02/19 10:52	1
Sulfate	ND		1.00	0.700	mg/L			07/02/19 10:52	1

# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: 9056 - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 400-446646/5**  
**Matrix: Water**  
**Analysis Batch: 446646**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.585		mg/L		96	90 - 110
Fluoride	10.0	9.661		mg/L		97	90 - 110
Sulfate	10.0	10.28		mg/L		103	90 - 110

**Lab Sample ID: LCSD 400-446646/6**  
**Matrix: Water**  
**Analysis Batch: 446646**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	10.0	9.562		mg/L		96	90 - 110	0	15
Fluoride	10.0	9.733		mg/L		97	90 - 110	1	15
Sulfate	10.0	10.34		mg/L		103	90 - 110	1	15

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 180-284931/1-A**  
**Matrix: Water**  
**Analysis Batch: 285066**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 284931**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0500	0.00959	mg/L		07/16/19 12:31	07/17/19 08:05	1

**Lab Sample ID: LCS 180-284931/2-A**  
**Matrix: Water**  
**Analysis Batch: 285066**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 284931**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.500	0.4874		mg/L		97	80 - 120

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 180-284933/1-A**  
**Matrix: Water**  
**Analysis Batch: 285155**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 284933**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00006100	J	0.00200	0.0000213	mg/L		07/16/19 12:33	07/17/19 12:24	1
Arsenic	ND		0.00500	0.000118	mg/L		07/16/19 12:33	07/17/19 12:24	1
Barium	0.0003340	J	0.200	0.000270	mg/L		07/16/19 12:33	07/17/19 12:24	1
Beryllium	ND		0.00200	0.000102	mg/L		07/16/19 12:33	07/17/19 12:24	1
Boron	0.02694	J	1.00	0.00339	mg/L		07/16/19 12:33	07/17/19 12:24	1
Cadmium	ND		0.00100	0.000152	mg/L		07/16/19 12:33	07/17/19 12:24	1
Calcium	ND		1.00	0.0412	mg/L		07/16/19 12:33	07/17/19 12:24	1
Chromium	0.0007650	J	0.00300	0.000339	mg/L		07/16/19 12:33	07/17/19 12:24	1
Cobalt	0.00002700	J	0.00500	0.0000218	mg/L		07/16/19 12:33	07/17/19 12:24	1
Iron	ND		50.0	14.1	ug/L		07/16/19 12:33	07/17/19 12:24	1
Lead	ND		0.00500	0.0000675	mg/L		07/16/19 12:33	07/17/19 12:24	1
Magnesium	ND		1000	82.7	ug/L		07/16/19 12:33	07/17/19 12:24	1
Molybdenum	ND		0.0100	0.000873	mg/L		07/16/19 12:33	07/17/19 12:24	1
Nickel	0.6280	J	1.00	0.312	ug/L		07/16/19 12:33	07/17/19 12:24	1

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# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: MB 180-284933/1-A**  
**Matrix: Water**  
**Analysis Batch: 285155**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 284933**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		0.0100	0.000348	mg/L		07/16/19 12:33	07/17/19 12:24	1
Sodium	368.4	J	1000	251	ug/L		07/16/19 12:33	07/17/19 12:24	1
Thallium	ND		0.00100	0.0000360	mg/L		07/16/19 12:33	07/17/19 12:24	1

**Lab Sample ID: LCS 180-284933/2-A**  
**Matrix: Water**  
**Analysis Batch: 285155**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 284933**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.250	0.2717		mg/L		109	80 - 120
Arsenic	1.00	1.069		mg/L		107	80 - 120
Barium	1.00	1.057		mg/L		106	80 - 120
Beryllium	0.500	0.5231		mg/L		105	80 - 120
Boron	1.25	1.249		mg/L		100	80 - 120
Cadmium	0.500	0.5296		mg/L		106	80 - 120
Calcium	25.0	27.50		mg/L		110	80 - 120
Chromium	0.500	0.5347		mg/L		107	80 - 120
Cobalt	0.500	0.5371		mg/L		107	80 - 120
Iron	5000	5770		ug/L		115	80 - 120
Lead	0.500	0.5177		mg/L		104	80 - 120
Magnesium	25000	27540		ug/L		110	80 - 120
Molybdenum	0.500	0.5258		mg/L		105	80 - 120
Nickel	500	540.7		ug/L		108	80 - 120
Selenium	1.00	1.096		mg/L		110	80 - 120
Sodium	25000	26850		ug/L		107	80 - 120
Thallium	1.00	1.032		mg/L		103	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 180-284352/1-A**  
**Matrix: Water**  
**Analysis Batch: 284460**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 284352**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.200	0.101	ug/L		07/10/19 08:40	07/10/19 18:01	1

**Lab Sample ID: LCS 180-284352/2-A**  
**Matrix: Water**  
**Analysis Batch: 284460**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 284352**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	2.50	2.667		ug/L		107	80 - 120

# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: 410.4 - COD

**Lab Sample ID: MB 400-447589/4**  
**Matrix: Water**  
**Analysis Batch: 447589**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chemical Oxygen Demand	ND		10.0	6.40	mg/L			07/11/19 14:05	1

**Lab Sample ID: LCS 400-447589/5**  
**Matrix: Water**  
**Analysis Batch: 447589**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	50.0	45.58		mg/L		91	90 - 110

**Lab Sample ID: 400-172358-1 MS**  
**Matrix: Water**  
**Analysis Batch: 447589**

**Client Sample ID: MW-102**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chemical Oxygen Demand	ND		3.75	ND		mg/L		NC	90 - 110

**Lab Sample ID: 400-172358-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 447589**

**Client Sample ID: MW-102**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chemical Oxygen Demand	ND		3.75	ND		mg/L		NC	90 - 110	NC	13

## Method: 9050A - Specific Conductance

**Lab Sample ID: MB 400-446304/1**  
**Matrix: Water**  
**Analysis Batch: 446304**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Specific Conductance	ND		5.00	5.00	umhos/cm			06/29/19 19:57	1

**Lab Sample ID: LCS 400-446304/2**  
**Matrix: Water**  
**Analysis Batch: 446304**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Specific Conductance	10.0	10.02		umhos/cm		100	98 - 102

## Method: 9060A - Organic Carbon, Total (TOC)

**Lab Sample ID: MB 400-447375/3**  
**Matrix: Water**  
**Analysis Batch: 447375**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	ND		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 1	ND		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 2	ND		1.00	0.500	mg/L			06/29/19 10:28	1
TOC Result 3	ND		1.00	0.500	mg/L			06/29/19 10:28	1

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# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: 9060A - Organic Carbon, Total (TOC) (Continued)

**Lab Sample ID: MB 400-447375/3**  
**Matrix: Water**  
**Analysis Batch: 447375**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
TOC Result 4	ND		1.00	0.500	mg/L			06/29/19 10:28	1
Total Organic Carbon - Quad	ND		1.00	0.500	mg/L			06/29/19 10:28	1

**Lab Sample ID: LCS 400-447375/5**  
**Matrix: Water**  
**Analysis Batch: 447375**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	10.0	9.239		mg/L		92	80 - 120
TOC Result 1	10.0	9.178		mg/L		92	80 - 120
TOC Result 2	10.0	9.356		mg/L		94	80 - 120
TOC Result 3	10.0	9.330		mg/L		93	80 - 120
TOC Result 4	10.0	9.093		mg/L		91	80 - 120
Total Organic Carbon - Quad	10.0	9.239		mg/L		92	80 - 120

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 400-446416/4**  
**Matrix: Water**  
**Analysis Batch: 446416**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity, Total	ND		1.00	0.980	mg/L			07/01/19 11:32	1

**Lab Sample ID: LCS 400-446416/5**  
**Matrix: Water**  
**Analysis Batch: 446416**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity, Total	100	102.3		mg/L		102	80 - 120

**Lab Sample ID: 400-172358-4 DU**  
**Matrix: Water**  
**Analysis Batch: 446416**

**Client Sample ID: MW-104**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity, Total	468		471.8		mg/L		0.8	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 400-446594/1**  
**Matrix: Water**  
**Analysis Batch: 446594**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		5.00	3.40	mg/L			07/02/19 15:23	1

# QC Sample Results

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

**Lab Sample ID: LCS 400-446594/2**  
**Matrix: Water**  
**Analysis Batch: 446594**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	293	276.0		mg/L		94	78 - 122

**Lab Sample ID: 400-172358-4 DU**  
**Matrix: Water**  
**Analysis Batch: 446594**

**Client Sample ID: MW-104**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1360		1380		mg/L		2	5

**Lab Sample ID: MB 400-446609/1**  
**Matrix: Water**  
**Analysis Batch: 446609**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		5.00	3.40	mg/L			07/02/19 16:42	1

**Lab Sample ID: LCS 400-446609/2**  
**Matrix: Water**  
**Analysis Batch: 446609**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	293	260.0		mg/L		89	78 - 122

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-433443/23-A**  
**Matrix: Water**  
**Analysis Batch: 439859**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.1063	U	0.122	0.122	1.00	0.318	pCi/L	07/02/19 12:58	08/19/19 18:00	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.7		40 - 110	07/02/19 12:58	08/19/19 18:00	1

**Lab Sample ID: LCS 160-433443/1-A**  
**Matrix: Water**  
**Analysis Batch: 439859**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433443**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.36		1.34	1.00	0.411	pCi/L	91	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	92.7		40 - 110

# QC Sample Results

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-433455/23-A**  
**Matrix: Water**  
**Analysis Batch: 439909**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4270		0.265	0.267	1.00	0.403	pCi/L	07/02/19 14:27	08/19/19 09:13	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.7		40 - 110	07/02/19 14:27	08/19/19 09:13	1
Y Carrier	84.9		40 - 110	07/02/19 14:27	08/19/19 09:13	1

**Lab Sample ID: LCS 160-433455/1-A**  
**Matrix: Water**  
**Analysis Batch: 439946**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 433455**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.92	10.43		1.19	1.00	0.411	pCi/L	117	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	92.7		40 - 110
Y Carrier	86.7		40 - 110

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-102**

**Lab Sample ID: 400-172358-1**

**Date Collected: 06/27/19 09:10**

**Matrix: Water**

**Date Received: 06/28/19 13:08**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 12:21	BAW	TAL PEN
Total/NA	Analysis	9056	DL	10			446646	07/02/19 16:27	BAW	TAL PEN
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:26	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 13:48	KAK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285296	07/18/19 12:20	KAK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:03	RJR	TAL PIT
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 12:42	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	25 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN
Total/NA	Prep	PrecSep-21			1000.49 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 16:03	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.49 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439946	08/19/19 09:07	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:52	SMP	TAL SL

**Client Sample ID: MW-105**

**Lab Sample ID: 400-172358-2**

**Date Collected: 06/27/19 10:51**

**Matrix: Water**

**Date Received: 06/28/19 13:08**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 13:30	BAW	TAL PEN
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:31	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 13:51	KAK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285296	07/18/19 12:23	KAK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:05	RJR	TAL PIT
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 12:51	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN

Eurofins TestAmerica, Pensacola

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Client Sample ID: MW-105

## Lab Sample ID: 400-172358-2

Date Collected: 06/27/19 10:51

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			500.59 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 16:03	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.59 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439946	08/19/19 09:07	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:52	SMP	TAL SL

## Client Sample ID: MW-110

## Lab Sample ID: 400-172358-3

Date Collected: 06/27/19 12:25

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 13:53	BAW	TAL PEN
Total/NA	Analysis	9056	DL	5			446646	07/02/19 16:50	BAW	TAL PEN
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:36	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 13:58	KAK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285296	07/18/19 12:26	KAK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:06	RJR	TAL PIT
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 12:56	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN
Total/NA	Prep	PrecSep-21			1000.25 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 16:05	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.25 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439946	08/19/19 09:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:52	SMP	TAL SL

## Client Sample ID: MW-104

## Lab Sample ID: 400-172358-4

Date Collected: 06/27/19 13:55

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 14:16	BAW	TAL PEN
Total/NA	Analysis	9056	DL	20			446646	07/02/19 17:13	BAW	TAL PEN
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:42	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 14:02	KAK	TAL PIT

Eurofins TestAmerica, Pensacola

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: MW-104**

**Lab Sample ID: 400-172358-4**

**Date Collected: 06/27/19 13:55**

**Matrix: Water**

**Date Received: 06/28/19 13:08**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285296	07/18/19 12:30	KAK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:07	RJR	TAL PIT
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 13:14	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	25 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN
Total/NA	Prep	PrecSep-21			750.62 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 16:04	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.62 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439946	08/19/19 09:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:52	SMP	TAL SL

**Client Sample ID: MW-7**

**Lab Sample ID: 400-172358-5**

**Date Collected: 06/27/19 15:10**

**Matrix: Water**

**Date Received: 06/28/19 13:08**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 14:38	BAW	TAL PEN
Total/NA	Analysis	9056	DL	50			446646	07/02/19 18:21	BAW	TAL PEN
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:47	RJG	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 14:05	KAK	TAL PIT
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285296	07/18/19 12:33	KAK	TAL PIT
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:08	RJR	TAL PIT
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 13:29	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	25 mL	50 mL	446609	07/02/19 16:42	VLS	TAL PEN
Total/NA	Prep	PrecSep-21			1000.74 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 16:03	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.74 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439946	08/19/19 09:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			440111	08/21/19 08:52	SMP	TAL SL

Eurofins TestAmerica, Pensacola



# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 160-433443/23-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 18:00	CDR	TAL SL

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 160-433455/23-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			1000 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1	1.0 mL	1.0 mL	439909	08/19/19 09:13	CDR	TAL SL

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 180-284352/1-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:01	RJR	TAL PIT

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 180-284931/1-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:05	RJG	TAL PIT

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 180-284933/1-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 12:24	KAK	TAL PIT

**Client Sample ID: Method Blank**

**Lab Sample ID: MB 400-446304/1**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-446394/4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 11:11	BAW	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-446416/4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 11:32	BAB	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-446594/1**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-446609/1**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446609	07/02/19 16:42	VLS	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-446646/4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446646	07/02/19 10:52	BAW	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-447375/3**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN

**Client Sample ID: Method Blank**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: MB 400-447589/4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 160-433443/1-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000 mL	1.0 g	433443	07/02/19 12:58	ORM	TAL SL
Total/NA	Analysis	903.0		1			439859	08/19/19 14:05	CDR	TAL SL

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 160-433455/1-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep_0			1000 mL	1.0 g	433455	07/02/19 14:27	ORM	TAL SL
Total/NA	Analysis	904.0		1			439946	08/19/19 09:06	CDR	TAL SL

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 180-284352/2-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	284352	07/10/19 08:40	RJR	TAL PIT
Total/NA	Analysis	7470A		1			284460	07/10/19 18:02	RJR	TAL PIT

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 180-284931/2-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	284931	07/16/19 12:31	NAM	TAL PIT
Total Recoverable	Analysis	6010C		1			285066	07/17/19 08:10	RJG	TAL PIT

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 180-284933/2-A**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	284933	07/16/19 12:33	NAM	TAL PIT
Total Recoverable	Analysis	6020A		1			285155	07/17/19 12:27	KAK	TAL PIT

**Client Sample ID: Lab Control Sample**

**Lab Sample ID: LCS 400-446304/2**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9050A		1			446304	06/29/19 19:57	DEK	TAL PEN

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446307/4**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9040C		1			446307	06/29/19 22:17	DEK	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446394/5**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 11:34	BAW	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446416/5**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 11:40	BAB	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446594/2**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446609/2**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	446609	07/02/19 16:42	VLS	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-446646/5**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446646	07/02/19 11:14	BAW	TAL PEN

**Client Sample ID: Lab Control Sample**

Date Collected: N/A

Date Received: N/A

**Lab Sample ID: LCS 400-447375/5**

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060A		1			447375	06/29/19 10:28	RRC	TAL PEN

# Lab Chronicle

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Client Sample ID: Lab Control Sample

**Lab Sample ID: LCS 400-447589/5**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN

## Client Sample ID: Lab Control Sample Dup

**Lab Sample ID: LCSD 400-446394/6**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 11:57	BAW	TAL PEN

## Client Sample ID: Lab Control Sample Dup

**Lab Sample ID: LCSD 400-446646/6**

Date Collected: N/A

Matrix: Water

Date Received: N/A

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446646	07/02/19 11:37	BAW	TAL PEN

## Client Sample ID: MW-102

**Lab Sample ID: 400-172358-1 MS**

Date Collected: 06/27/19 09:10

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 12:44	BAW	TAL PEN
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN

## Client Sample ID: MW-102

**Lab Sample ID: 400-172358-1 MSD**

Date Collected: 06/27/19 09:10

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056		1			446394	07/01/19 13:07	BAW	TAL PEN
Total/NA	Analysis	410.4		1	2 mL	2 mL	447589	07/11/19 14:05	DN1	TAL PEN

## Client Sample ID: MW-104

**Lab Sample ID: 400-172358-4 DU**

Date Collected: 06/27/19 13:55

Matrix: Water

Date Received: 06/28/19 13:08

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2320B		1			446416	07/01/19 13:23	BAB	TAL PEN
Total/NA	Analysis	SM 2540C		1	25 mL	50 mL	446594	07/02/19 15:23	VLS	TAL PEN

**Laboratory References:**

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# Method Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

Method	Method Description	Protocol	Laboratory
9056	Anions, Ion Chromatography	SW846	TAL PEN
6010C	Metals (ICP)	SW846	TAL PIT
6020A	Metals (ICP/MS)	SW846	TAL PIT
7470A	Mercury (CVAA)	SW846	TAL PIT
410.4	COD	MCAWW	TAL PEN
9040C	pH	SW846	TAL PEN
9050A	Specific Conductance	SW846	TAL PEN
9060A	Organic Carbon, Total (TOC)	SW846	TAL PEN
SM 2320B	Alkalinity	SM	TAL PEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL PEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL PIT
7470A	Preparation, Mercury	SW846	TAL PIT

#### Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.  
SM = "Standard Methods For The Examination Of Water And Wastewater"  
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL PEN = Eurofins TestAmerica, Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001  
TAL PIT = Eurofins TestAmerica, Pittsburgh, 301 Alpha Drive, RIDC Park, Pittsburgh, PA 15238, TEL (412)963-7058

# Accreditation/Certification Summary

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

## Laboratory: Eurofins TestAmerica, Pensacola

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Kentucky (WW)	State Program	98030	12-31-19
<p>The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.</p>			
Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	pH
9040C		Water	Temperature
9050A		Water	Specific Conductance
9056		Water	Chloride
9056		Water	Fluoride
9056		Water	Sulfate
9060A		Water	TOC Result 1
9060A		Water	TOC Result 2
9060A		Water	TOC Result 3
9060A		Water	TOC Result 4
9060A		Water	Total Organic Carbon
9060A		Water	Total Organic Carbon - Quad

## Laboratory: Eurofins TestAmerica, Pittsburgh

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Arkansas DEQ	State	19-033-0	06-27-20
Arkansas DEQ	State Program	88-0690	06-27-20
California	State	2891	04-30-20
California	State Program	2891	04-30-20
Connecticut	State	PH-0688	09-30-20
Connecticut	State Program	PH-0688	09-30-20
Florida	NELAP	E871008	06-30-20
Florida	NELAP	E871008	06-30-20
Illinois	NELAP	200005	06-30-20
Illinois	NELAP	004375	06-30-20
Kansas	NELAP	E-10350	01-31-20
Kansas	NELAP	E-10350	03-31-20
Kentucky (UST)	State Program	162013	04-30-20
Kentucky (WW)	State	KY98043	12-31-19
Kentucky (WW)	State Program	KY98043	12-31-19
Louisiana	NELAP	04041	06-30-20
Minnesota	NELAP	042-999-482	12-31-19
Minnesota	NELAP	042-999-482	12-31-19
Nevada	State Program	PA00164	07-31-20
New Hampshire	NELAP	2030	04-04-20
New Jersey	NELAP	PA005	06-30-20
New Jersey	NELAP	PA005	06-30-20
New York	NELAP	11182	03-31-20
New York	NELAP	11182	04-01-20
North Carolina (WW/SW)	State Program	434	12-31-19
North Dakota	State Program	R-227	04-30-20
Oregon	NELAP	PA-2151	02-06-20
Oregon	NELAP	PA-2151	02-06-20
Pennsylvania	NELAP	02-00416	04-30-20

Eurofins TestAmerica, Pensacola

# Accreditation/Certification Summary

Client: Big Rivers Electric Corporation  
Project/Site: Semi-Annual

Job ID: 400-172358-1  
SDG: D.B. Wilson Station

## Laboratory: Eurofins TestAmerica, Pittsburgh (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Pennsylvania	NELAP	02-00416	04-30-20
Rhode Island	State	LAO00362	12-30-19
Rhode Island	State Program	LAO00362	12-30-19
South Carolina	State Program	89014	04-30-20
Texas	NELAP	T104704528-15-2	03-31-20
Texas	NELAP	T104704528	03-31-20
US Fish & Wildlife	Federal	LE94312A-1	07-31-19
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P-Soil-01	06-26-22
USDA	US Federal Programs	P330-16-00211	06-26-22
Utah	NELAP	PA001462015-4	05-31-20
Utah	NELAP	PA001462019-8	05-31-20
Virginia	NELAP	460189	09-14-19
Virginia	NELAP	10043	09-14-19
West Virginia DEP	State	142	01-31-20
West Virginia DEP	State Program	142	01-31-20
Wisconsin	State	998027800	08-31-19
Wisconsin	State Program	998027800	08-31-19



# Accreditation/Certification Summary

Client: Big Rivers Electric Corporation  
 Project/Site: Semi-Annual

Job ID: 400-172358-1  
 SDG: D.B. Wilson Station

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	DoD	L2305	04-06-22
ANAB	DOE	L2305.01	04-06-22
Arizona	State	AZ0813	12-08-19
Arizona	State Program	AZ0813	12-08-19
California	State	2886	06-30-20
California	State Program	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Connecticut	State Program	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
Florida	NELAP	E87689	06-30-20
Hawaii	State Program	NA	06-30-20
Illinois	NELAP	200023	11-30-19
Illinois	NELAP	004553	11-30-19
Iowa	State Program	373	12-01-20
Kansas	NELAP	E-10236	10-31-19
Kentucky (DW)	State	KY90125	12-31-19
Kentucky (DW)	State Program	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	NELAP	LA011	12-31-19
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
Maryland	State Program	310	09-30-20
Michigan	State Program	9005	06-30-20
Missouri	State	780	06-30-22
Missouri	State Program	780	06-30-20
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	03-31-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
North Dakota	State Program	R207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-19
Oklahoma	State Program	9997	08-31-19 *
Pennsylvania	NELAP	68-00540	02-28-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State Program	85002001	06-30-20
Texas	NELAP	T104704193-19-14	07-31-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	Federal	058448	07-31-20
USDA	Federal	P330-17-0028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	460230	06-14-20
Virginia	NELAP	10310	06-14-20
Washington	State Program	C592	08-30-19
West Virginia DEP	State Program	381	08-31-19 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

**Chain of Custody Record**



<b>Client Information</b> Company: Big Rivers Electric Corporation Address: PO BOX 24 City: Henderson State, Zip: KY, 42419 Phone: 254922 Email: mike.galbraith@bigrivers.com Project Name: Big Rivers CCR and SA GW Site: D.B. Wilson		Lab PM: Cisneros, Roxanne E-Mail: roxanne.cisneros@testamericainc.com Phone: 270-832-8915 Due Date Requested: ASAP TAT Requested (days):		Sampler: R. Crume Carrier Tracking No(s): 400-172358 COC COC No: 400-84746-31747.1 Page: Page 1 of 1 Job #:	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:			
Empty Kit Relinquished by:		Method of Shipment:			
Relinquished by: <i>Rob Crume</i>		Date/Time: 6/27/19 / 16:00		Company: BREC	
Relinquished by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks: 4.0°C / 2.7°C IR8		Company:	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Solid, Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of Containers	Special Instructions/Note:
MW-102	6/27/19	09:10	G	Water	✓	✓	60100, 6020A, 7470A	10	
MW-105	"	10:51	"	Water	✓	✓	9056 ORGFM 280 - Cl, F, SO4	10	
MW-110	"	12:25	"	Water	✓	✓	9060A - TOC	10	
MW-104	"	13:55	"	Water	✓	✓	2320B, 2540C, 9040C, 9050A	10	
MW-7	"	15:10	"	Water	✓	✓	410A - COD	9	
				Water					
				Water					
				Water					
				Water					
				Water					
				Water					



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ST 25  
R 639  
5  
12.00  
A  
0289  
62 90



400-172358 Waybill



400-172338 Waybill

ORIGIN ID: PNSA (850) 474-1001  
SAMPLE RECEIVING  
TEST AMERICA PENSACOLA  
3955 MCLEMORE DR

SHIP DATE: 28 JUN 19  
ACTWGT: 14.15 LB  
CAD: 0335306/CAFE3211

PENSACOLA, FL 32514  
UNITED STATES US

RECIPIENT

TO SAMPLE CONTROL  
TESTAMERICA PITTSBURG  
301 ALPHA DRIVE  
RIDC PARK  
PITTSBURGH PA 15238

(412) 963-7068

REF:

DEPT:



FedEx Express



SATURDAY 12:00P  
PRIORITY OVERNIGHT

TRK# 4535 0242 5820  
0201

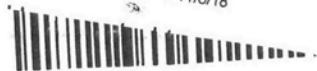
XQ AGCA

15238  
PA-US PIT

Uncorrected temp  
Thermometer ID

CF 2013 No Ice Initials

PT-WI-SR-001 effective 11/8/18



## Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 400-172358-3  
SDG Number: D.B. Wilson Station

**Login Number: 172358**

**List Number: 1**

**Creator: Perez, Trina M**

**List Source: Eurofins TestAmerica, Pensacola**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.0°C, 2.7°C IR-8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: Big Rivers Electric Corporation

Job Number: 400-172358-3  
SDG Number: D.B. Wilson Station

**Login Number: 172358**

**List Number: 2**

**Creator: Harris, Lorin C**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 06/29/19 09:32 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Certificate of Analysis 9103066

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:56

Project Name: MW-1 Wilson 092-00004

Workorder: 9103066

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/04/2019 16:05.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville

A handwritten signature in black ink that reads "Angela Deal".

Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103066-01	MW1/	Water	11/04/2019 13:10	11/04/2019 16:05	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103066-01	Field Conductance	3660			
	Field pH	5.10			
	Field Temp (C)	16.77			

### ANALYTICAL RESULTS

Lab Sample ID: **9103066-01**  
 Description: **MW1**

Sample Collection Date Time: 11/04/2019 13:10  
 Sample Received Date Time: 11/04/2019 16:05

**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	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Arsenic</b>	<b>0.0020</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Barium</b>	<b>0.007</b>		mg/L	0.004	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
Boron	ND	D2, M1, M4, U	mg/L	1.00	1.00	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:40	AKB
<b>Cadmium</b>	<b>0.0079</b>		mg/L	0.0010	0.0001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Calcium</b>	<b>500</b>	D1, M2	mg/L	40.0	13.0	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:44	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Iron</b>	<b>73.2</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:40	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Lithium</b>	<b>0.14</b>	M1	mg/L	0.02	0.005	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:23	DBP
<b>Magnesium</b>	<b>197</b>	D1, M1	mg/L	20.0	9.00	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:44	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Nickel</b>	<b>0.812</b>	M2	mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Potassium</b>	<b>12.3</b>	D2, M2, M4	mg/L	5.00	2.20	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:40	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:23	DBP
<b>Sodium</b>	<b>111</b>	D1, M2	mg/L	26.0	10.0	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:44	AKB
<b>Thallium</b>	<b>0.0006</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:42	DMH
<b>Zinc</b>	<b>1.40</b>	D1, M3	mg/L	0.20	0.20	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:26	DBP

**Conventional Chemistry Analyses Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>71</b>		mg/L	4		2320 B-2011	11/18/2019 09:38	11/18/2019 09:38	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 09:38	11/18/2019 09:38	HMF
<b>Total Alkalinity</b>	<b>71</b>		mg/L	4		2320 B-2011	11/18/2019 09:38	11/18/2019 09:38	HMF
<b>Chemical Oxygen Demand</b>	<b>48</b>		mg/L	5	5	HACH 8000	11/19/2019 15:37	11/19/2019 15:37	HMF
<b>Specific Conductance (Lab)</b>	<b>3220</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:33	11/22/2019 12:33	DJK
<b>Hardness as CaCO3</b>	<b>1940</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/07/2019 09:16	11/07/2019 09:16	ALT
<b>Total Dissolved Solids</b>	<b>3410</b>		mg/L	500	500	2540 C-2011	11/05/2019 12:35	11/06/2019 16:31	MAG
<b>Total Organic Carbon</b>	<b>1.2</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:33	11/08/2019 04:13	HMF

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
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**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.145</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.808</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>0.953</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>113</b>	D	mg/L	25.0	18.0	EPA 300.0 REV 2.1	11/11/2019 10:20	11/11/2019 10:20	CSC
<b>Fluoride</b>	<b>1.10</b>		mg/L	0.20		EPA 300.0 REV 2.1	11/11/2019 10:20	11/11/2019 10:20	CSC
<b>Sulfate</b>	<b>2260</b>	D	mg/L	100	50.0	EPA 300.0 REV 2.1	11/11/2019 10:20	11/11/2019 10:20	CSC

**Notes for work order 9103066**

- 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.   |
| E    | Concentration exceeds calibration range  |
| 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.  |
| 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).                    |

**Standard Quallifiers/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                   |

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103066**

Shipped By: Client

Temperature: 1.20° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-1 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-36  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Traavis Speed*  
\*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 \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103066-01 A	<u>11-04-19</u>	<u>13:10</u>	Plastic 1L	1	MW1	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103066-01 B	<u>11-04-19</u>	<u>13:10</u>	Plastic 500mL pH<2 w/HNO3	1	MW1	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103066-01 C	<u>11-04-19</u>	<u>13:10</u>	Plastic 500mL pH<2 w/H2SO4	1	MW1	g / c	COD TOC
9103066-01 D	<u>11-04-19</u>	<u>13:10</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW1	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: *NDK*

1.2

Field data collected by: *Traavis Speed* Date (mm/dd/yy) 11-04-19 Time (24 hr) 13:10  
 pH 5.10 Cond (umho) 3660 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) <u><i>Traavis Speed</i></u>	Received by: (Signature) <u><i>May Gray</i></u>	Date (mm/dd/yy) <u>11-4-19</u>	Time (24 hr) <u>1605</u>
_____	_____	_____	_____
_____	_____	_____	_____



Chain of Custody  
Scheduled for: 10/14/2019

Laboratories, Inc.  
ical Laboratory  
e, KY 42431  
nt: Big Rivers Electric Corporation Wilson  
ation  
Project: MW-1 Wilson 092-00004

Report To:  
Big Rivers Electric Corporation Wilson  
Station  
Mike Galbraith  
PO Box 24  
Henderson, KY 42419  
Phone: (270) 844-6000  
PWS ID#:  
State: KY

Invoice To:  
Big Rivers Electric Corporation Wilson Station  
Brian Edwards  
PO Box 24  
Henderson, KY 42419  
PO#: 252827-31

Please Print Legibly

Collected by (Signature): [Signature] \*required information\*

Quote# \_\_\_\_\_  
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	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
9103066	(mm/dd/yy):	Time (24 hr):					
Sample ID#							
9103066-01 E	<u>11-04-19</u>	<u>13:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1 ✓	MW1	g/c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
9103066-01 F	<u>11-04-19</u>	<u>13:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub)	1 ✓	MW1	g/c	Radium 228 (sub)
			Preservation Check: pH: <u>✓</u>				
9103066-01 G	<u>11-04-19</u>	<u>13:10</u>	Plastic 1L pH<2 w/HNO3 (Sub)	1 ✓	MW1	g/c	Radium Total (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: N/D

Field data collected by: Travis Sneed Date (mm/dd/yy) 11-04-19 Time (24 hr) 10

pH 5.10 Cond (umho) 3660 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) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 11-4-19 Time (24 hr) 16:05

MMLI - Check here if trip charge applied to associated COC

Printed: 9 5:49:31AM

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

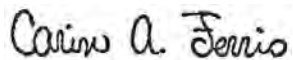
RE: Project: 9103066  
Pace Project No.: 30334693

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 9103066  
Pace Project No.: 30334693

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103066  
Pace Project No.: 30334693

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334693001	9103066-01	Water	11/04/19 13:10	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103066  
Pace Project No.: 30334693

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334693001	9103066-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103066  
Pace Project No.: 30334693

**Sample: 9103066-01**      **Lab ID: 30334693001**      Collected: 11/04/19 13:10      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.145 ± 0.314 (0.580)</b> C:NA T:96%	pCi/L	12/02/19 11:26	13982-63-3	
Radium-228	EPA 904.0	<b>0.808 ± 0.343 (0.539)</b> C:87% T:92%	pCi/L	11/27/19 11:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.953 ± 0.657 (1.12)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103066  
Pace Project No.: 30334693

---

QC Batch:	370980	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30334693001		

---

METHOD BLANK:	1800091	Matrix:	Water
Associated Lab Samples:	30334693001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0321 ± 0.281 (0.648) C:85% T:88%	pCi/L	11/27/19 11:14	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103066  
Pace Project No.: 30334693

---

QC Batch:	370981	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30334693001		

---

METHOD BLANK:	1800092	Matrix:	Water
Associated Lab Samples:	30334693001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0408 ± 0.330 (0.647) C:NA T:94%	pCi/L	12/02/19 10:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

## REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103066  
Pace Project No.: 30334693

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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Chain of Custody



Workorder: 9103066      Workorder Name: MW-1 Wilson 092-00004      Owner Received Date: 11/4/2019      Results Requested By: Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1	9103066-01		11/04/19 13:10	IR44-McCoy	Water	X	X	X	ce1
2									
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334693

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1		11-8-19 1400		11-9-19 10:00	
2					
3					

Cooler Temperature on Receipt 5.9 °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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103066**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal

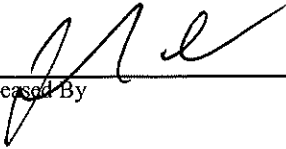
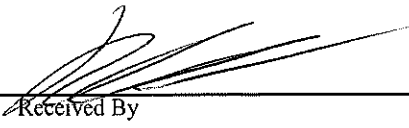
**RECEIVING LABORATORY:**

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
<b>Sample ID: 9103066-01</b>	<b>Water</b>	<b>Sampled: 11/04/2019 13:10</b>	<b>Specific Method</b>
Radium Total (sub)	05/02/2020 13:10	EPA 903.0	
Radium 228 (sub)	05/02/2020 13:10	EPA 904.0	
Radium 226 (sub)	05/02/2020 13:10	EPA 903.1	

#-30334695

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30334693

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label	<u>PM</u>
LIMS Login	<u>PM</u>

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 8.9 °C    Correction Factor: 0 °C    Final Temp: 8.9 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>PM 11-11-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>No time/date on samples</u>
-Includes date/time/ID      Matrix: <u>WT</u>				
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PHCZ</u>
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date: <u>11-11-19</u>

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.



## Certificate of Analysis 9103068

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/06/2019 15:38

Project Name: MW-102 Wilson 092-00004

Workorder: 9103068

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/08/2019 15:35.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



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 Madisonville, KY 42431  
 270.821.7375  
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Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

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**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103068-01	MW102/	Water	11/08/2019 12:25	11/08/2019 15:35	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103068-01	Field Conductance	1190			
	Field pH	6.61			
	Field Temp (C)	15.62			

### ANALYTICAL RESULTS

Lab Sample ID: **9103068-01**  
 Description: **MW102**

Sample Collection Date Time: 11/08/2019 12:25  
 Sample Received Date Time: 11/08/2019 15:35

#### 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	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Arsenic</b>	<b>0.0031</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Barium</b>	<b>0.059</b>		mg/L	0.004	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Boron	ND	D2, M4, U	mg/L	1.00	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:03	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Calcium</b>	<b>85.1</b>	D2	mg/L	4.00	1.30	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:03	AKB
<b>Chromium</b>	<b>0.0006</b>	J	mg/L	0.0020	0.0006	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Iron</b>	<b>4.43</b>	D2, M1	mg/L	1.00	0.500	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:03	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Magnesium</b>	<b>36.9</b>	D2, M1	mg/L	2.00	0.900	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:03	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Nickel</b>	<b>0.002</b>	J	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Potassium	ND	D2, L1, M4, U	mg/L	5.00	2.20	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:03	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
<b>Sodium</b>	<b>126</b>	D1, M1	mg/L	26.0	10.0	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:06	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:02	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>286</b>		mg/L	4		2320 B-2011	11/18/2019 09:45	11/18/2019 09:45	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 09:45	11/18/2019 09:45	HMF
<b>Total Alkalinity</b>	<b>286</b>		mg/L	4		2320 B-2011	11/18/2019 09:45	11/18/2019 09:45	HMF
<b>Chemical Oxygen Demand</b>	<b>25</b>		mg/L	5	5	HACH 8000	11/27/2019 17:25	11/27/2019 17:25	HMF
<b>Specific Conductance (Lab)</b>	<b>1120</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:34	11/22/2019 12:34	DJK
<b>Hardness as CaCO3</b>	<b>348</b>		mg/L	1	1	2340 C (as HACH 8226)	11/12/2019 11:06	11/12/2019 11:06	ALT
<b>Total Dissolved Solids</b>	<b>728</b>		mg/L	50	50	2540 C-2011	11/12/2019 16:52	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.2</b>		mg/L	0.5		5310 C-2011	11/11/2019 16:27	11/13/2019 00:34	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.180</b>	_Sub	pCi/L			EPA 903.1	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium-228</b>	<b>0.425</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND



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 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

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**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium	0.425	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	35.3		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/15/2019 21:25	11/15/2019 21:25	CSC
Fluoride	0.36		mg/L	0.20		EPA 300.0 REV 2.1	11/15/2019 21:25	11/15/2019 21:25	CSC
Sulfate	307	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/15/2019 21:25	11/15/2019 21:25	CSC

**Notes for work order 9103068**

- 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.  |
| J    | Estimated value.  |
| L1   | The associated blank spike recovery was above method acceptance limits.   |
| M1   | Matrix spike recovery was high; the method control sample recovery was acceptable.  |
| M2   | Matrix spike recovery was low; the method control sample recovery was acceptable.   |
| 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/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103068**

Shipped By: Client

Temperature: 1.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-102 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103068-01 A	<u>11-08-19</u>	<u>12:25</u>	Plastic 1L	1	MW102	g/c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103068-01 B	<u>11-08-19</u>	<u>12:25</u>	Plastic 500mL pH<2 w/HNO3	1	MW102	g/c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103068-01 C	<u>11-08-19</u>	<u>12:25</u>	Plastic 500mL pH<2 w/H2SO4	1	MW102	g/c	COD TOC
9103068-01 D	<u>11-08-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW102	g/c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: *NOY*

Field data collected by: *Travis Speed* Date (mm/dd/yy) 11-08-19 Time (24 hr) 12:25  
 pH 6.61 Cond (umho) 1190 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 15.62 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Speed* Received by: (Signature) *Mary Genger* Date (mm/dd/yy) 11-08-19 Time (24 hr) 1535

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station

Project: **MW-102 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

PO#: 252827-35

Please Print Legibly

Quote# \_\_\_\_\_

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 9103068 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103068-01 E	<u>11-08-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: _____	1 ✓	MW102	g / c	Radium 228 (sub)
9103068-01 F	<u>11-08-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: _____	1 ✓	MW102	g / c	Radium 228 (sub)
9103068-01 G	<u>11-08-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: _____	1 ✓	MW102	g / c	Radium Total (sub)

Preservation Check Performed by: NPX

Field data collected by: Travis Sneed Date (mm/dd/yy) 11-08-19 Time (24 hr) 12:25

pH 6.61 Cond (umho) 1190 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.62 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>May Yager</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____



December 06, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

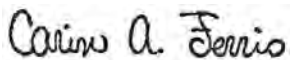
RE: Project: 9103068  
Pace Project No.: 30335308

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 9103068

Pace Project No.: 30335308

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103068  
Pace Project No.: 30335308

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30335308001	9103068-01	Water	11/08/19 12:25	11/13/19 10:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103068  
Pace Project No.: 30335308

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30335308001	9103068-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103068  
Pace Project No.: 30335308

**Sample: 9103068-01**      **Lab ID: 30335308001**      Collected: 11/08/19 12:25      Received: 11/13/19 10:10      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.180 ± 0.408 (0.845)</b> C:NA T:93%	pCi/L	12/06/19 11:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.425 ± 0.333 (0.645)</b> C:75% T:82%	pCi/L	12/04/19 14:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.425 ± 0.741 (1.49)</b>	pCi/L	12/06/19 13:24	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103068  
Pace Project No.: 30335308

---

QC Batch:	371026	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30335308001		

---

METHOD BLANK:	1800179	Matrix:	Water
Associated Lab Samples:	30335308001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.139 ± 0.459 (0.772) C:NA T:92%	pCi/L	12/06/19 10:57	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103068  
Pace Project No.: 30335308

---

QC Batch:	371027	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30335308001		

---

METHOD BLANK:	1800180	Matrix:	Water
Associated Lab Samples:	30335308001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.969 ± 0.446 (0.738) C:81% T:74%	pCi/L	12/04/19 11:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103068  
Pace Project No.: 30335308

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.



Chain of Custody



Workorder: 9103068

Workorder Name: MW-102 Wilson 092-0000 Owner Received Date: 11/8/2019

Results Requested By:

Report To: Subcontract To: Requested Analysis

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

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

Preserved Containers

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	EPA 903.0	EPA 903.1	EPA 904.0	LAB USE ONLY
1						X	X	X	CE1
2	9103068-01		11/08/19 12:25	IR44-McCoy	Water				
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30335308

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1				11-13-19 BWC	
2					
3					

Cooler Temperature on Receipt 0.8 °C Custody Seal Y or N Received on Ice Y or N Sample Intact Y or N

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

**SUBCONTRACT ORDER**  
**McCoy & McCoy Laboratories, Inc.**  
**9103068**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal

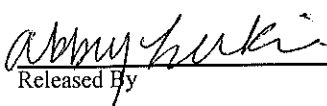
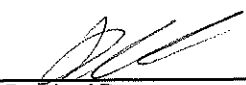
**RECEIVING LABORATORY:**

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: 9103068-01	Water	Sampled:11/08/2019 12:25	Specific Method	
Radium Total (sub)		05/06/2020 12:25	EPA 903.0	
Radium 228 (sub)		05/06/2020 12:25	EPA 904.0	
Radium 226 (sub)		05/06/2020 12:25	EPA 903.1	

**#-30335308**

	11-11-19		11-13-19 10:10
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McLay & McLay

Project # -30335308

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5389

Label	<u>DM</u>
LIMS Login	<u>DM</u>

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

Thermometer Used 9      Type of Ice:  Wet     Blue     None  
 Cooler Temperature      Observed Temp 0.9 °C      Correction Factor: 0 °C      Final Temp: 0.6 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1E00391</u>	<u>DM 11-13-19</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Includes date/time/ID      Matrix: <u>UT</u>					
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix				<u>DMCZ</u>	
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DM</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DM</u>	Date: <u>11-13-19</u>

Client Notification/ Resolution: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Person Contacted: \_\_\_\_\_

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.

## Certificate of Analysis 9103069

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/06/2019 15:37

Project Name: MW-104 Wilson 092-00004

Workorder: 9103069

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/08/2019 15:35.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville

A handwritten signature in black ink that reads "Angela Deal".

Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103069-01	MW104/	Water	11/08/2019 10:50	11/08/2019 15:35	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103069-01	Field Conductance	1870			
	Field pH	6.64			
	Field Temp (C)	14.65			

### ANALYTICAL RESULTS

Lab Sample ID: **9103069-01**  
 Description: **MW104**

Sample Collection Date Time: 11/08/2019 10:50  
 Sample Received Date Time: 11/08/2019 15:35

#### 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	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Arsenic</b>	<b>0.0027</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Barium</b>	<b>0.064</b>		mg/L	0.004	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:09	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Calcium</b>	<b>257</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:13	AKB
<b>Chromium</b>	<b>0.0037</b>		mg/L	0.0020	0.0006	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Copper</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Iron</b>	<b>9.29</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:09	AKB
<b>Lead</b>	<b>0.002</b>		mg/L	0.002	0.0005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Magnesium</b>	<b>68.9</b>	D2	mg/L	2.00	0.900	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:09	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Nickel</b>	<b>0.005</b>		mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Potassium</b>	<b>4.17</b>	D2, L1	mg/L	5.00	2.20	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:09	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
<b>Sodium</b>	<b>77.7</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:09	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:06	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>386</b>		mg/L	4		2320 B-2011	11/18/2019 09:50	11/18/2019 09:50	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 09:50	11/18/2019 09:50	HMF
<b>Total Alkalinity</b>	<b>386</b>		mg/L	4		2320 B-2011	11/18/2019 09:50	11/18/2019 09:50	HMF
<b>Chemical Oxygen Demand</b>	<b>41</b>		mg/L	5	5	HACH 8000	11/27/2019 17:25	11/27/2019 17:25	HMF
<b>Specific Conductance (Lab)</b>	<b>1740</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:35	11/22/2019 12:35	DJK
<b>Hardness as CaCO3</b>	<b>880</b>	D	mg/L	2	2	2340 C (as HACH 8226)	11/12/2019 11:08	11/12/2019 11:08	ALT
<b>Total Dissolved Solids</b>	<b>1490</b>		mg/L	50	50	2540 C-2011	11/12/2019 16:56	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>0.8</b>		mg/L	0.5		5310 C-2011	11/11/2019 16:27	11/13/2019 00:55	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.029</b>	_Sub	pCi/L			EPA 903.1	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium-228</b>	<b>1.21</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium</b>	<b>1.24</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	13.2		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/15/2019 21:58	11/15/2019 21:58	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	11/15/2019 21:58	11/15/2019 21:58	CSC
Sulfate	587	D, M1	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/15/2019 21:58	11/15/2019 21:58	CSC

**Notes for work order 9103069**

- 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.
- J Estimated value.
- L1 The associated blank spike recovery was above method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M2 Matrix spike recovery was low; the method control sample recovery was acceptable.
- 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/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103069**

Shipped By: Client

Temperature: 1.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-104 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Traavis Speed  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103069-01 A	<u>11-08-19</u>	<u>10:50</u>	Plastic 1L	1	MW104	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103069-01 B	<u>11-08-19</u>	<u>10:50</u>	Plastic 500mL pH<2 w/HNO3	1	MW104	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103069-01 C	<u>11-08-19</u>	<u>10:50</u>	Plastic 500mL pH<2 w/H2SO4	1	MW104	g / c	COD TOC
9103069-01 D	<u>11-08-19</u>	<u>10:50</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW104	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: NOY

Field data collected by: Traavis Speed Date (mm/dd/yy) 11-08-19 Time (24 hr) 10:50

pH 6.64 Cond (umho) 1,870 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 14.65 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Traavis Speed</u>	Received by: (Signature) <u>May Yeager</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-104 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Trevi Sneed  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103069-01 E	<u>11-08-19</u>	<u>10:50</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW104	g / c	Radium 228 (sub)
9103069-01 F	<u>11-08-19</u>	<u>10:50</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW104	g / c	Radium 228 (sub)
9103069-01 G	<u>11-08-19</u>	<u>10:50</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	MW104	g / c	Radium Total (sub)

Preservation Check Performed by: NDY

Field data collected by: Trevi Sneed Date (mm/dd/yy) 11-08-19 Time (24 hr) 10:50

pH 6.64 Cond (umho) 1,870 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 14.65 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature)  
Trevi Sneed

Received by: (Signature)  
Mary Yager

Date (mm/dd/yy) 11-08-19  
 Time (24 hr) 1535

MMLI - Check here if trip charge applied to associated COC

Printed: 10/31/2019 5:53:20AM

December 06, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

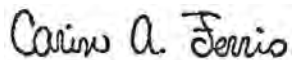
RE: Project: 9103069  
Pace Project No.: 30335306

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 9103069  
Pace Project No.: 30335306

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103069  
Pace Project No.: 30335306

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30335306001	9103069-01	Water	11/08/19 10:50	11/13/19 10:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103069  
Pace Project No.: 30335306

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30335306001	9103069-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103069

Pace Project No.: 30335306

**Sample: 9103069-01**      **Lab ID: 30335306001**      Collected: 11/08/19 10:50      Received: 11/13/19 10:10      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
Radium-226	EPA 903.1	<b>0.0287 ± 0.494 (0.888)</b> C:NA T:94%	pCi/L	12/06/19 11:18	13982-63-3	
Radium-228	EPA 904.0	<b>1.21 ± 0.519 (0.832)</b> C:76% T:77%	pCi/L	12/04/19 14:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.24 ± 1.01 (1.72)</b>	pCi/L	12/06/19 13:24	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103069  
Pace Project No.: 30335306

---

QC Batch: 371026	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30335306001	

---

METHOD BLANK: 1800179	Matrix: Water
Associated Lab Samples: 30335306001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.139 ± 0.459 (0.772) C:NA T:92%	pCi/L	12/06/19 10:57	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103069  
Pace Project No.: 30335306

---

QC Batch: 371027	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30335306001	

---

METHOD BLANK: 1800180	Matrix: Water
Associated Lab Samples: 30335306001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.969 ± 0.446 (0.738) C:81% T:74%	pCi/L	12/04/19 11:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103069  
Pace Project No.: 30335306

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103069      Workorder Name: MW-104 Wilson 092-0000      Owner Received Date: 11/8/2019      Results Requested By: [Redacted]

Report To: [Redacted]      Subcontract To: [Redacted]

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

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1	9103069-01		11/08/19 10:50	IR44-McCoy	Water	X	X	X	COC
2									
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30335306

Cooler Temperature on Receipt 3.1 °C      Custody Seal Y or N      Received on Ice Y for 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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103069**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal


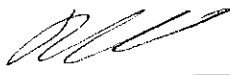
**RECEIVING LABORATORY:**

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: 9103069-01	Water	Sampled: 11/08/2019 10:50	Specific Method
Radium Total (sub)	05/06/2020 10:50	EPA 903.0	
Radium 228 (sub)	05/06/2020 10:50	EPA 904.0	
Radium 226 (sub)	05/06/2020 10:50	EPA 903.1	

**#-30335306**

	11-11-19		11-13-19 10:10
Released By	Date	Received By	Date
	Date	Received By	Date

# Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30335306

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Label PA  
LIMS Login MM

Tracking #: 1107 3385 5389

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

Thermometer Used 9 Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 3.1 °C Correction Factor: 0 °C Final Temp: 31 °C

Temp should be above freezing to 6°C

pH paper Lot# 1090391 Date and initials of person examining contents: PA 11-13-09

**Comments:**

	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>No time/date on samples</u>
-Includes date/time/ID Matrix: <u>INT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PMU2</u>
Filtered volume received for Dissolved tests All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PA</u> Date/time of preservation: _____
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PA</u> Date: <u>11-13-09</u>
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**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.

## Certificate of Analysis 9103070

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:56

Project Name: MW-105 Wilson 092-00004

Workorder: 9103070

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103070-01	MW105/	Water	11/07/2019 10:45	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
9103070-01	Field Conductance				948
	Field pH				7.51
	Field Temp (C)				16.35

### ANALYTICAL RESULTS

Lab Sample ID: **9103070-01**  
 Description: **MW105**

Sample Collection Date Time: 11/07/2019 10:45  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 13:12	DBP
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Barium</b>	<b>0.326</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
Boron	ND	D2, M4, U	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:28	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Calcium</b>	<b>72.0</b>	D2, M1	mg/L	4.00	1.30	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:28	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Iron</b>	<b>2.26</b>	D2, M1	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:28	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Lithium</b>	<b>0.03</b>	M1	mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Magnesium</b>	<b>22.4</b>	D2, M1	mg/L	2.00	0.900	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:28	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Potassium</b>	<b>3.62</b>	D2, M4	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:28	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
<b>Sodium</b>	<b>126</b>	D1, M1	mg/L	26.0	10.0	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:31	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP
Zinc	ND	M2, U	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:12	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>423</b>		mg/L	4		2320 B-2011	11/18/2019 09:56	11/18/2019 09:56	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 09:56	11/18/2019 09:56	HMF
<b>Total Alkalinity</b>	<b>423</b>		mg/L	4		2320 B-2011	11/18/2019 09:56	11/18/2019 09:56	HMF
<b>Chemical Oxygen Demand</b>	<b>8</b>		mg/L	5	5	HACH 8000	11/27/2019 16:46	11/27/2019 16:46	HMF
<b>Specific Conductance (Lab)</b>	<b>954</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:36	11/22/2019 12:36	DJK
<b>Hardness as CaCO3</b>	<b>294</b>		mg/L	1	1	2340 C (as HACH 8226)	11/12/2019 11:10	11/12/2019 11:10	ALT
<b>Total Dissolved Solids</b>	<b>612</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:00	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 14:51	HMF
<b>Total Organic Carbon</b>	<b>1.1</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/10/2019 13:23	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.332</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND





P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoyslabs.com](http://www.mccoyslabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**Subcontracted Analyses**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-228</b>	<b>0.497</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>0.829</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>10.1</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/15/2019 22:31	11/15/2019 22:31	CSC
<b>Fluoride</b>	<b>0.55</b>		mg/L	0.20		EPA 300.0 REV 2.1	11/15/2019 22:31	11/15/2019 22:31	CSC
<b>Sulfate</b>	<b>73.7</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/15/2019 22:31	11/15/2019 22:31	CSC

**Notes for work order 9103070**

- 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.  |
| 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).             |
| Y1   | Sample RPD exceeded the method control limit.   |

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

<b>Sample Acceptance Checklist for Work Order 9103070</b>	
Shipped By: Client	Temperature: 1.90° Celcius
<b>Condition</b>	
Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-105 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: ky

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Trevin Speed*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

MMLI USE ONLY	*required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date	Collection					
Sample ID#	(mm/dd/yy):	Time (24 hr):					
9103070-01 A	<u>11-07-19</u>	<u>10:45</u>	Plastic 1L	1	MW105	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103070-01 B	<u>11-07-19</u>	<u>10:45</u>	Plastic 500mL pH<2 w/HNO3	1	MW105	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103070-01 C	<u>11-07-19</u>	<u>10:45</u>	Plastic 500mL pH<2 w/H2SO4	1	MW105	g / c	COD TOC
9103070-01 D	<u>11-07-19</u>	<u>10:45</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW105	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: NOY

Field data collected by: <u>Trevin Speed</u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>10:45</u>
pH <u>7.51</u>	Cond (umho) <u>948</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.35</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Total Cl (mg/L) _____		Free Cl (mg/L) _____
DO (mg/L) _____		Turb. (NTU) _____

Relinquished by: (Signature) <u><i>Trevin Speed</i></u>	Received by: (Signature) <u><i>May Yager</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-105 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
 \*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 \*required information\***

Workorder # 9103070 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103070-01 E	<u>11-07-19</u>	<u>10:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u> ✓	MW105	g / c	Radium 228 (sub)
9103070-01 F	<u>11-07-19</u>	<u>10:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u> ✓	MW105	g / c	Radium 228 (sub)
9103070-01 G	<u>11-07-19</u>	<u>10:45</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u> ✓	MW105	g / c	Radium Total (sub)

Preservation Check Performed by: *NPJ*

Field data collected by: <u><i>Travis Speed</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>10:45</u>
pH <u>7.51</u>	Cond (umho) <u>948</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.35</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Tot Cl (mg/L) _____	Free Cl (mg/L) _____	DO (mg/L) _____
Turb. (NTU) _____		

Relinquished by: (Signature) <u><i>Travis Speed</i></u>	Received by: (Signature) <u><i>Myrta</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

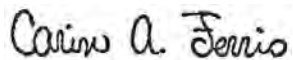
RE: Project: 9103070  
Pace Project No.: 30334704

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 9103070  
Pace Project No.: 30334704

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103070  
Pace Project No.: 30334704

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334704001	9103070-01	Water	11/07/19 10:45	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103070  
Pace Project No.: 30334704

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334704001	9103070-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103070  
Pace Project No.: 30334704

**Sample: 9103070-01**      **Lab ID: 30334704001**      Collected: 11/07/19 10:45      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.332 ± 0.377 (0.595)</b> C:NA T:91%	pCi/L	12/03/19 11:28	13982-63-3	
Radium-228	EPA 904.0	<b>0.497 ± 0.362 (0.708)</b> C:80% T:87%	pCi/L	12/02/19 16:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.829 ± 0.739 (1.30)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 9103070  
Pace Project No.: 30334704

---

QC Batch:	370987	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30334704001		

---

METHOD BLANK:	1800103	Matrix:	Water
Associated Lab Samples:	30334704001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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**

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103070  
Pace Project No.: 30334704

---

QC Batch: 370988	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30334704001	

---

METHOD BLANK: 1800104	Matrix: Water
Associated Lab Samples: 30334704001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0385 ± 0.251 (0.505) C:NA T:92%	pCi/L	12/03/19 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103070  
Pace Project No.: 30334704

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103070      Workorder Name: MW-105 Wilson 092-0000      Owner Received Date: 11/7/2019      Results Requested By: \_\_\_\_\_  
 Report To: \_\_\_\_\_      Subcontract To: \_\_\_\_\_      Requested Analysis: \_\_\_\_\_

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY										
1	9103070-01		11/07/19 10:45	IR44-McCoy	Water				X	EPA 903.0									
2									X	EPA 903.1									
3									X	EPA 904.0									
4																			
5																			
6																			
7																			
8																			
9																			
10																			

WO#: 30334704

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1		11-8-19 1400		11-9-19 10:20	
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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103070**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal



**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
<b>Sample ID: 9103070-01</b>	<b>Water</b>	<b>Sampled: 11/07/2019 10:45</b>	<b>Specific Method</b>
Radium Total (sub)	05/05/2020 10:45	EPA 903.0	
Radium 228 (sub)	05/05/2020 10:45	EPA 904.0	
Radium 226 (sub)	05/05/2020 10:45	EPA 903.1	

#-30334704

	11-8-19		11-9-19 10:02
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # -30334704

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label <u>ML</u>
LIMS Login <u>ML</u>

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 9.8 °C    Correction Factor: 0 °C    Final Temp: 9.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1000391</u>			Date and Initials of person examining contents: <u>ML 11-11-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>no time/date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PHCZ</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ML</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>ML</u> Date: <u>11-11-19</u>

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.



## Certificate of Analysis 9103072

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:55

Project Name: MW-110 Wilson 092-00004

Workorder: 9103072

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville

A handwritten signature in black ink that reads "Angela Deal".

Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103072-01	MW110/	Water	11/07/2019 12:25	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103072-01	Field Conductance	483			
	Field pH	6.83			
	Field Temp (C)	16.02			

### ANALYTICAL RESULTS

Lab Sample ID: **9103072-01**  
 Description: **MW110**

Sample Collection Date Time: 11/07/2019 12:25  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 13:20	DBP
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Barium</b>	<b>0.051</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Calcium</b>	<b>47.6</b>	D2	mg/L	4.00	1.30	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Iron</b>	<b>2.97</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Lithium</b>	<b>0.006</b>	J	mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Magnesium</b>	<b>19.4</b>	D2	mg/L	2.00	0.900	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Potassium	ND	D2, u	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
<b>Sodium</b>	<b>28.4</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:34	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:20	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>162</b>		mg/L	4		2320 B-2011	11/18/2019 10:02	11/18/2019 10:02	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 10:02	11/18/2019 10:02	HMF
<b>Total Alkalinity</b>	<b>162</b>		mg/L	4		2320 B-2011	11/18/2019 10:02	11/18/2019 10:02	HMF
Chemical Oxygen Demand	ND	u	mg/L	5	5	HACH 8000	11/27/2019 16:46	11/27/2019 16:46	HMF
<b>Specific Conductance (Lab)</b>	<b>531</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:05	11/22/2019 12:05	DJK
<b>Hardness as CaCO3</b>	<b>210</b>		mg/L	1	1	2340 C (as HACH 8226)	11/12/2019 11:12	11/12/2019 11:12	ALT
<b>Total Dissolved Solids</b>	<b>348</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:04	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>0.7</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 08:32	HMF
<b>Total Organic Carbon</b>	<b>1.0</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/26/2019 23:07	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.515</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.586</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>1.10</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	10.0		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/15/2019 23:03	11/15/2019 23:03	CSC
Fluoride	0.23		mg/L	0.20		EPA 300.0 REV 2.1	11/15/2019 23:03	11/15/2019 23:03	CSC
Sulfate	61.2	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/15/2019 23:03	11/15/2019 23:03	CSC

**Notes for work order 9103072**

- 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.
- D2 Sample required dilution due to matrix interference.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103072**

Shipped By: Client

Temperature: 1.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-110 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: 154

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
 \*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 \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103072-01 A	<u>11-07-19</u>	<u>12:25</u>	Plastic 1L	1	MW110	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103072-01 B	<u>11-07-19</u>	<u>12:25</u>	Plastic 500mL pH<2 w/HNO3	1	MW110	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103072-01 C	<u>11-07-19</u>	<u>12:25</u>	Plastic 500mL pH<2 w/H2SO4	1	MW110	g / c	COD TOC
9103072-01 D	<u>11-07-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW110	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: NDV

Field data collected by: Travis Speed Date (mm/dd/yy) 11-07-19 Time (24 hr) 12:25

pH 6.83 Cond (umho) 483 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.02 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Speed</i></u>	Received by: (Signature) <u><i>May Yeager</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-110 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103072-01 E	<u>11-07-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW110	g / c	Radium 228 (sub)
9103072-01 F	<u>11-07-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW110	g / c	Radium 228 (sub)
9103072-01 G	<u>11-07-19</u>	<u>12:25</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW110	g / c	Radium Total (sub)

Preservation Check Performed by: *NDY*

Field data collected by: *Travis Speed* Date (mm/dd/yy) 11-07-19 Time (24 hr) 12:25

pH 6.83 Cond (umho) 483 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.02 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Speed</i></u>	Received by: (Signature) <u><i>Andy Yeager</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

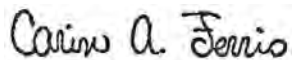
RE: Project: 9103072  
Pace Project No.: 30334703

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 9103072  
Pace Project No.: 30334703

### **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

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### SAMPLE SUMMARY

Project: 9103072  
Pace Project No.: 30334703

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334703001	9103072-01	Water	11/07/19 12:25	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103072  
Pace Project No.: 30334703

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334703001	9103072-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103072  
Pace Project No.: 30334703

**Sample: 9103072-01**      **Lab ID: 30334703001**      Collected: 11/07/19 12:25      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.515 ± 0.497 (0.779)</b> C:NA T:96%	pCi/L	12/03/19 11:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.586 ± 0.354 (0.665)</b> C:79% T:97%	pCi/L	12/02/19 16:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.10 ± 0.851 (1.44)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103072  
Pace Project No.: 30334703

---

QC Batch: 370987	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30334703001	

---

METHOD BLANK: 1800103	Matrix: Water
Associated Lab Samples: 30334703001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103072  
Pace Project No.: 30334703

---

QC Batch: 370988	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30334703001	

---

METHOD BLANK: 1800104	Matrix: Water
Associated Lab Samples: 30334703001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0385 ± 0.251 (0.505) C:NA T:92%	pCi/L	12/03/19 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103072  
Pace Project No.: 30334703

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103072

Workorder Name: MW-110 Wilson 092-0000

Owner Received Date: 11/7/2019

Results Requested By:

Report To: \_\_\_\_\_ Subcontract To: \_\_\_\_\_ Requested Analysis: \_\_\_\_\_

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@mccoyslabs.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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1	9103072-01		11/07/19 12:25	IR44-McCoy	Water	X	X	X	ce1
2									
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334703



Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	11-8-19 1400	<i>[Signature]</i>	11-9-19 1800	
2					
3					

Cooler Temperature on Receipt 9.8 °C Custody Seal  Y / or  N Received on Ice  Y / or  N Sample Intact  Y / or  N

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



**SUBCONTRACT ORDER**  
**McCoy & McCoy Laboratories, Inc.**  
**9103072**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal

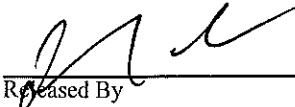
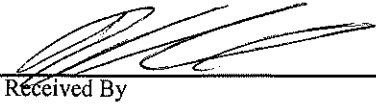
**RECEIVING LABORATORY:**

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: 9103072-01	Water	Sampled: 11/07/2019 12:25	Specific Method
Radium Total (sub)	05/05/2020 12:25	EPA 903.0	
Radium 228 (sub)	05/05/2020 12:25	EPA 904.0	
Radium 226 (sub)	05/05/2020 12:25	EPA 903.1	

#-30334703

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # #-30334703

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label <u>pk</u>
LIMS Login <u>pk</u>

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 9.8 °C    Correction Factor: 0 °C    Final Temp: 9.8 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1000391</u>			Date and Initials of person examining contents: <u>pk 11-11-09</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID    Matrix: <u>WT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>No time/date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>pk</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>pk</u> Date/Time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>pk</u> Date: <u>11-11-09</u>

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.

## Certificate of Analysis 9103073

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/06/2019 15:37

Project Name: MW-2 Wilson 092-00004

Workorder: 9103073

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/08/2019 15:35.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103073-01	MW2/	Water	11/08/2019 08:15	11/08/2019 15:35	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103073-01	Field Conductance	808			
	Field pH	6.27			
	Field Temp (C)	15.09			

### ANALYTICAL RESULTS

Lab Sample ID: **9103073-01**  
 Description: **MW2**

Sample Collection Date Time: 11/08/2019 08:15  
 Sample Received Date Time: 11/08/2019 15:35

#### 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	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Arsenic</b>	<b>0.0186</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Barium</b>	<b>0.139</b>		mg/L	0.004	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Calcium</b>	<b>59.8</b>	D2	mg/L	4.00	1.30	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Iron</b>	<b>26.0</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Magnesium</b>	<b>31.9</b>	D2	mg/L	2.00	0.900	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Nickel</b>	<b>0.004</b>		mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Potassium	ND	D2, L1, u	mg/L	5.00	2.20	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
<b>Sodium</b>	<b>55.8</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:16	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:09	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>298</b>		mg/L	4		2320 B-2011	11/18/2019 10:06	11/18/2019 10:06	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 10:06	11/18/2019 10:06	HMF
<b>Total Alkalinity</b>	<b>298</b>		mg/L	4		2320 B-2011	11/18/2019 10:06	11/18/2019 10:06	HMF
<b>Chemical Oxygen Demand</b>	<b>49</b>		mg/L	5	5	HACH 8000	11/27/2019 17:25	11/27/2019 17:25	HMF
<b>Specific Conductance (Lab)</b>	<b>733</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:37	11/22/2019 12:37	DJK
<b>Hardness as CaCO3</b>	<b>530</b>		mg/L	1	1	2340 C (as HACH 8226)	11/12/2019 11:14	11/12/2019 11:14	ALT
<b>Total Dissolved Solids</b>	<b>330</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:08	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>7.1</b>		mg/L	0.5		5310 C-2011	11/11/2019 16:27	11/13/2019 01:17	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.628</b>	_Sub	pCi/L			EPA 903.1	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium-228</b>	<b>0.757</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium</b>	<b>1.39</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>15.0</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/15/2019 23:36	11/15/2019 23:36	CSC
<b>Fluoride</b>	<b>0.27</b>		mg/L	0.20		EPA 300.0 REV 2.1	11/15/2019 23:36	11/15/2019 23:36	CSC
<b>Sulfate</b>	<b>61.6</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/15/2019 23:36	11/15/2019 23:36	CSC

**Notes for work order 9103073**

- 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.
- D2 Sample required dilution due to matrix interference.
- J Estimated value.
- L1 The associated blank spike recovery was above method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M2 Matrix spike recovery was low; the method control sample recovery was acceptable.
- 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/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103073**

Shipped By: Client

Temperature: 1.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-2 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: 164

PO#: 252827-35  
 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) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103073-01 A	<u>11-08-19</u>	<u>8:15</u>	Plastic 1L	1	MW2	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103073-01 B	<u>11-08-19</u>	<u>8:15</u>	Plastic 500mL pH<2 w/HNO3	1	MW2	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103073-01 C	<u>11-08-19</u>	<u>8:15</u>	Plastic 500mL pH<2 w/H2SO4	1	MW2	g / c	COD TOC
9103073-01 D	<u>11-08-19</u>	<u>8:15</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW2	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: NDY

Field data collected by: Traavis Sneed Date (mm/dd/yy) 11-08-19 Time (24 hr) 8:15  
 pH 6.27 Cond (umho) 808 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 15.09 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) [Signature] Date (mm/dd/yy) 11-08-19 Time (24 hr) 1535



# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-2 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: Ky

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Traavis Speed  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103073-01 E	<u>11-08-19</u>	<u>8:15</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW2	g / c	Radium 228 (sub)
9103073-01 F	<u>11-08-19</u>	<u>8:15</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW2	g / c	Radium 228 (sub)
9103073-01 G	<u>11-08-19</u>	<u>8:15</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	MW2	g / c	Radium Total (sub)

Preservation Check Performed by: NDY

Field data collected by: <u>Traavis Speed</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>8:15</u>
pH <u>6.27</u>	Cond (umho) <u>408</u>	Res Cl (mg/L) _____
Temp (oC) <u>15.09</u>	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	Free Cl (mg/L) _____
	or (g/min) _____	Static Water Level _____
		DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u>Traavis Speed</u>	Received by: (Signature) <u>Mary Yeager</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 06, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

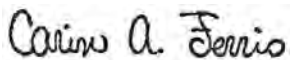
RE: Project: 9103073  
Pace Project No.: 30335313

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 9103073  
Pace Project No.: 30335313

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103073  
Pace Project No.: 30335313

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30335313001	9103073-01	Water	11/08/19 08:15	11/13/19 10:10

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 9103073  
Pace Project No.: 30335313

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30335313001	9103073-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103073  
Pace Project No.: 30335313

**Sample: 9103073-01**      **Lab ID: 30335313001**      Collected: 11/08/19 08:15      Received: 11/13/19 10:10      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
Radium-226	EPA 903.1	<b>0.628 ± 0.552 (0.752)</b> C:NA T:90%	pCi/L	12/06/19 11:34	13982-63-3	
Radium-228	EPA 904.0	<b>0.757 ± 0.403 (0.705)</b> C:80% T:80%	pCi/L	12/04/19 14:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.39 ± 0.955 (1.46)</b>	pCi/L	12/06/19 13:24	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 9103073  
Pace Project No.: 30335313

---

QC Batch:	371026	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30335313001		

---

METHOD BLANK:	1800179	Matrix:	Water
Associated Lab Samples:	30335313001		

---

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.139 ± 0.459 (0.772) C:NA T:92%	pCi/L	12/06/19 10:57	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

**REPORT OF LABORATORY ANALYSIS**

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## QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103073  
Pace Project No.: 30335313

---

QC Batch:	371027	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	30335313001		

---

METHOD BLANK:	1800180	Matrix:	Water
Associated Lab Samples:	30335313001		

---

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.969 ± 0.446 (0.738) C:81% T:74%	pCi/L	12/04/19 11:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

## REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103073  
Pace Project No.: 30335313

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103073    Workorder Name: MW-2 Wilson 092-00004    Owner Received Date: 11/8/2019    Results Requested By:

Report To: Subcontract To: Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@mccoyslabs.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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1									
2	9103073-01		11/08/19 08:15	IR44-McCoy	Water	X	X	X	COA
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30335313

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1			<i>[Signature]</i>	11-17-19 10:10	
2					
3					

Cooler Temperature on Receipt 20 °C    Custody Seal Y or N (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

McCoy & McCoy Laboratories, Inc.  
9103073

#-30335313

SENDING LABORATORY:

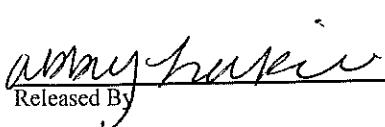
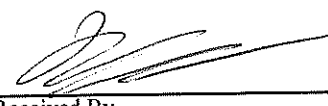
McCoy & McCoy Laboratories, Inc.  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Angela Deal

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: 9103073-01	Water	Sampled: 11/08/2019 08:15	Specific Method
Radium Total (sub)	05/06/2020 08:15	EPA 903.0	
Radium 228 (sub)	05/06/2020 08:15	EPA 904.0	
Radium 226 (sub)	05/06/2020 08:15	EPA 903.1	


 Released By \_\_\_\_\_ Date 11-11-19

 Received By \_\_\_\_\_ Date 11-19-19 10:10

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # #-30335315

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5389

Label	<u>AK</u>
LIMS Login	<u>AK</u>

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

Thermometer Used 9      Type of Ice:  Wet  Blue  None

Cooler Temperature      Observed Temp 2.0 °C      Correction Factor: 0 °C      Final Temp: 2.0 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents:
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. <u>1E00391</u>
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>NT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>No time/date on sample</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PHC2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>AK</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>8mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>AK</u> Date: <u>11-13-19</u>

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.

## Certificate of Analysis 9103074

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:55

Project Name: MW-3 Wilson 092-00004

Workorder: 9103074

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103074-01	MW3/	Water	11/07/2019 09:20	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103074-01	Field Conductance	1520			
	Field pH	6.67			
	Field Temp (C)	16.27			

### ANALYTICAL RESULTS

Lab Sample ID: **9103074-01**  
 Description: **MW3**

Sample Collection Date Time: 11/07/2019 09:20  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Arsenic</b>	<b>0.0010</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Barium</b>	<b>0.014</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:41	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Calcium</b>	<b>229</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:44	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Iron</b>	<b>3.40</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:41	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Magnesium</b>	<b>58.1</b>	D2	mg/L	2.00	0.900	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:41	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Molybdenum</b>	<b>0.003</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Nickel</b>	<b>0.007</b>		mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Potassium</b>	<b>5.38</b>	D2	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:41	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
<b>Sodium</b>	<b>28.6</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:41	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:27	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>265</b>		mg/L	4		2320 B-2011	11/18/2019 10:11	11/18/2019 10:11	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 10:11	11/18/2019 10:11	HMF
<b>Total Alkalinity</b>	<b>265</b>		mg/L	4		2320 B-2011	11/18/2019 10:11	11/18/2019 10:11	HMF
Chemical Oxygen Demand	ND	u	mg/L	5	5	HACH 8000	11/27/2019 16:46	11/27/2019 16:46	HMF
<b>Specific Conductance (Lab)</b>	<b>1420</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:38	11/22/2019 12:38	DJK
<b>Hardness as CaCO3</b>	<b>800</b>	D	mg/L	2	2	2340 C (as HACH 8226)	11/12/2019 11:16	11/12/2019 11:16	ALT
<b>Total Dissolved Solids</b>	<b>1040</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:12	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.3</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/10/2019 14:08	HMF
<b>Total Organic Carbon</b>	<b>0.5</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 15:34	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.196</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.880</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>1.08</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>29.7</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/16/2019 00:42	11/16/2019 00:42	CSC
<b>Fluoride</b>	<b>0.23</b>		mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 00:42	11/16/2019 00:42	CSC
<b>Sulfate</b>	<b>463</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/16/2019 00:42	11/16/2019 00:42	CSC

**Notes for work order 9103074**

- 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.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

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



**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103074**

Shipped By: Client

Temperature: 1.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-3 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: Ky

PO#: 252822-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
 \*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 # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103074-01 A	<u>11-07-19</u> <u>9:20</u>	Plastic 1L	1	MW3	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103074-01 B	<u>11-07-19</u> <u>9:20</u>	Plastic 500mL pH<2 w/HNO3	1	MW3	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103074-01 C	<u>11-07-19</u> <u>9:20</u>	Plastic 500mL pH<2 w/H2SO4	1	MW3	g / c	COD TOC
9103074-01 D	<u>11-07-19</u> <u>9:20</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW3	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: NOY

Field data collected by: Travis Speed Date (mm/dd/yy) 11-07-19 Time (24 hr) 9:20  
 pH 6.67 Cond (umho) 4520 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 16.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Speed</i></u>	Received by: (Signature) <u><i>Mike Galbraith</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-3 Wilson 092-00004**

Phone: (270) 844-6000

PWS ID#:

State: ISV

PO#: \_\_\_\_\_

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Trevi*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103074-01 E	<u>11-07-19</u>	<u>9:20</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW3	g / c	Radium 228 (sub)
9103074-01 F	<u>11-07-19</u>	<u>9:20</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW3	g / c	Radium 228 (sub)
9103074-01 G	<u>11-07-19</u>	<u>9:20</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1 <u>✓</u>	MW3	g / c	Radium Total (sub)

Preservation Check Performed by: *NDY*

Field data collected by: <u><i>Trevi Sanced</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>9:20</u>
pH <u>6.67</u>	Cond (umho) <u>4520</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.27</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Tot Cl (mg/L) _____	Free Cl (mg/L) _____	DO (mg/L) _____
		Turb. (NTU) _____

Relinquished by: (Signature) <u><i>Trevi Sanced</i></u>	Received by: (Signature) <u><i>May Young</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

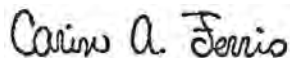
RE: Project: 9103074  
Pace Project No.: 30334701

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 9103074  
Pace Project No.: 30334701

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103074  
Pace Project No.: 30334701

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334701001	9103074-01	Water	11/07/19 09:20	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 9103074  
Pace Project No.: 30334701

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334701001	9103074-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103074

Pace Project No.: 30334701

**Sample: 9103074-01**      **Lab ID: 30334701001**      Collected: 11/07/19 09:20      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.196 ± 0.304 (0.527)</b> C:NA T:96%	pCi/L	12/03/19 11:17	13982-63-3	
Radium-228	EPA 904.0	<b>0.880 ± 0.384 (0.633)</b> C:81% T:95%	pCi/L	12/02/19 16:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.08 ± 0.688 (1.16)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 9103074

Pace Project No.: 30334701

QC Batch: 370987

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 30334701001

METHOD BLANK: 1800103

Matrix: Water

Associated Lab Samples: 30334701001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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**

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103074

Pace Project No.: 30334701

QC Batch: 370988

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 30334701001

METHOD BLANK: 1800104

Matrix: Water

Associated Lab Samples: 30334701001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0385 ± 0.251 (0.505) C:NA T:92%	pCi/L	12/03/19 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103074  
Pace Project No.: 30334701

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103074      Workorder Name: MW-3 Wilson 092-00004      Owner Received Date: 11/7/2019      Results Requested By: \_\_\_\_\_  
 Report To: \_\_\_\_\_      Subcontract To: \_\_\_\_\_      Requested Analysis: \_\_\_\_\_

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1									
2	9103074-01		11/07/19 09:20	IR44-McCoy	Water	X	X	X	CEL
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334701



Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	11-8-19 1400	<i>[Signature]</i>	11-9-19 10:00	
2					
3					

Cooler Temperature on Receipt 9.2 °C      Custody Seal Y or N      Received on Ice Y or N      Sample Intact Y or N

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

**SUBCONTRACT ORDER**  
**McCoy & McCoy Laboratories, Inc.**  
**9103074**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal

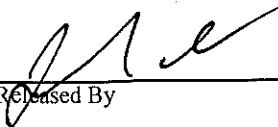
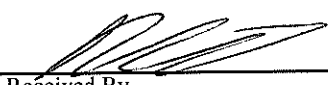
**RECEIVING LABORATORY:**

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: 9103074-01      Water      Sampled: 11/07/2019 09:20		Specific Method	
Radium Total (sub)	05/05/2020 09:20	EPA 903.0	
Radium 228 (sub)	05/05/2020 09:20	EPA 904.0	
Radium 226 (sub)	05/05/2020 09:20	EPA 903.1	

#-30334701

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # #-30334701

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label	<u>PK</u>
LIMS Login	<u>PA</u>

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 9.2 °C      Correction Factor: 0 °C      Final Temp: 9.2 °C

Temp should be above freezing to 6°C

Comments:	Yes	No	N/A	pH paper Lot#	Date and Initials of person examining contents:
				<u>1000391</u>	<u>PK 11-11-19</u>
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>MT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<u>no time/place</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<u>PKCZ</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u>	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u>	Date: <u>11-11-19</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

A check in this box indicates that additional information has been stored in reports.

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.

## Certificate of Analysis 9103076

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/06/2019 15:36

Project Name: MW-4D Wilson 092-00004

Workorder: 9103076

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/08/2019 15:35.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103076-01	MW4D/	Water	11/08/2019 13:45	11/08/2019 15:35	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103076-01	Field Conductance	4980			
	Field pH	6.34			
	Field Temp (C)	15.51			



### ANALYTICAL RESULTS

Lab Sample ID: **9103076-01**  
 Description: **MW4D**

Sample Collection Date Time: 11/08/2019 13:45  
 Sample Received Date Time: 11/08/2019 15:35

#### 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	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Arsenic</b>	<b>0.0032</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Barium</b>	<b>0.016</b>		mg/L	0.004	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Boron</b>	<b>9.11</b>	D2	mg/L	1.00	1.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:32	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Calcium</b>	<b>628</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:35	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Iron</b>	<b>12.3</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:32	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Lithium</b>	<b>0.14</b>		mg/L	0.02	0.005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Magnesium</b>	<b>224</b>	D1	mg/L	20.0	9.00	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:35	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Molybdenum</b>	<b>0.01</b>		mg/L	0.01	0.002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Nickel</b>	<b>0.030</b>		mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Potassium</b>	<b>48.9</b>	D2, L1	mg/L	5.00	2.20	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:49	AKB
<b>Selenium</b>	<b>0.001</b>	J	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Sodium</b>	<b>206</b>	D1	mg/L	26.0	10.0	SW846 6010 B	11/11/2019 11:47	11/14/2019 16:35	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH
<b>Zinc</b>	<b>0.02</b>		mg/L	0.02	0.02	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:13	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>339</b>		mg/L	4		2320 B-2011	11/18/2019 10:22	11/18/2019 10:22	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 10:22	11/18/2019 10:22	HMF
<b>Total Alkalinity</b>	<b>339</b>	M2	mg/L	4		2320 B-2011	11/18/2019 10:22	11/18/2019 10:22	HMF
<b>Chemical Oxygen Demand</b>	<b>50</b>		mg/L	5	5	HACH 8000	11/27/2019 18:50	11/27/2019 18:50	HMF
<b>Specific Conductance (Lab)</b>	<b>4480</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:40	11/22/2019 12:40	DJK
<b>Hardness as CaCO3</b>	<b>2250</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/12/2019 11:20	11/12/2019 11:20	ALT
<b>Total Dissolved Solids</b>	<b>3500</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:20	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>0.5</b>		mg/L	0.5		5310 C-2011	11/11/2019 16:27	11/13/2019 01:39	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	0.00	_Sub	pCi/L			EPA 903.1	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium-228</b>	<b>1.86</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium</b>	<b>1.86</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	537	D	mg/L	25.0	18.0	EPA 300.0 REV 2.1	11/16/2019 02:04	11/16/2019 02:04	CSC
Fluoride	0.21		mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 01:48	11/16/2019 01:48	CSC
Sulfate	1100	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/16/2019 01:48	11/16/2019 01:48	CSC

**Notes for work order 9103076**

- 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.
- J Estimated value.
- L1 The associated blank spike recovery was above method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M2 Matrix spike recovery was low; the method control sample recovery was acceptable.
- 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/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103076**

Shipped By: Client

Temperature: 1.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: Ky

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Trevor Sneed*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

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

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103076-01 A	<u>11-08-19</u>	<u>13:45</u>	Plastic 1L	1	MW4D	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103076-01 B	<u>11-08-19</u>	<u>13:45</u>	Plastic 500mL pH<2 w/HNO3	1	MW4D	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103076-01 C	<u>11-08-19</u>	<u>13:45</u>	Plastic 500mL pH<2 w/H2SO4	1	MW4D	g / c	COD TOC
9103076-01 D	<u>11-08-19</u>	<u>13:45</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW4D	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: *Trevor Sneed*

Field data collected by: Trevor Sneed Date (mm/dd/yy) 11-08-19 Time (24 hr) 13:45  
 pH 6.34 Cond (umho) 4980 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 15.51 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Trevor Sneed</i></u>	Received by: (Signature) <u><i>Maya Payer</i></u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-4D Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: Ky

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103076-01 E	<u>11-08-19</u>	<u>13:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW4D	g / c	Radium 228 (sub)
9103076-01 F	<u>11-08-19</u>	<u>13:45</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW4D	g / c	Radium 228 (sub)
9103076-01 G	<u>11-08-19</u>	<u>13:45</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: _____	1	MW4D	g / c	Radium Total (sub)

Preservation Check Performed by: NSP

Field data collected by: <u>Travis Sneed</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>13:45</u>
pH <u>6.34</u>	Cond (umho) <u>4980</u>	Res Cl (mg/L) _____
Temp (oC) <u>15.51</u>	or (oF) _____	Static Water Level _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Tot Cl (mg/L) _____	Free Cl (mg/L) _____	DO (mg/L) _____
Turb. (NTU) _____		

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>May Yager</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 06, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

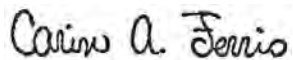
RE: Project: 9103076  
Pace Project No.: 30335307

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: 9103076

Pace Project No.: 30335307

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103076  
Pace Project No.: 30335307

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30335307001	9103076-01	Water	11/08/19 13:45	11/13/19 10:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103076  
Pace Project No.: 30335307

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30335307001	9103076-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103076

Pace Project No.: 30335307

**Sample: 9103076-01**      **Lab ID: 30335307001**      Collected: 11/08/19 13:45      Received: 11/13/19 10:10      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
Radium-226	EPA 903.1	<b>0.000 ± 0.578 (1.04)</b> C:NA T:88%	pCi/L	12/06/19 11:18	13982-63-3	
Radium-228	EPA 904.0	<b>1.86 ± 0.571 (0.674)</b> C:78% T:82%	pCi/L	12/04/19 14:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.86 ± 1.15 (1.71)</b>	pCi/L	12/06/19 13:24	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103076

Pace Project No.: 30335307

QC Batch: 371026

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 30335307001

METHOD BLANK: 1800179

Matrix: Water

Associated Lab Samples: 30335307001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.139 ± 0.459 (0.772) C:NA T:92%	pCi/L	12/06/19 10:57	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103076  
Pace Project No.: 30335307

---

QC Batch: 371027	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30335307001	

---

METHOD BLANK: 1800180	Matrix: Water
Associated Lab Samples: 30335307001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.969 ± 0.446 (0.738) C:81% T:74%	pCi/L	12/04/19 11:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103076  
Pace Project No.: 30335307

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103076      Workorder Name: MW-4D Wilson 092-00004      Owner Received Date: 11/8/2019      Results Requested By: \_\_\_\_\_  
 Report To: \_\_\_\_\_      Subcontract To: \_\_\_\_\_      Requested Analysis: \_\_\_\_\_

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

Pace Analytical Services LLC Greensburg P/1  
 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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1									
2	9103076-01		11/08/19 13:45	IR44-McCoy	Water	X	X	X	COA
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30335307

Transfers Released By: \_\_\_\_\_      Date/Time: \_\_\_\_\_      Received By: \_\_\_\_\_      Date/Time: 11-07-19 16:10

Cooler Temperature on Receipt: 14 °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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103076**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal


**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
<b>Sample ID: 9103076-01</b>	<b>Water</b>	<b>Sampled:11/08/2019 13:45</b>	<b>Specific Method</b>
Radium Total (sub)	05/06/2020 13:45	EPA 903.0	
Radium 228 (sub)	05/06/2020 13:45	EPA 904.0	
Radium 226 (sub)	05/06/2020 13:45	EPA 903.1	

#-30335301

*abby hickie*      11-11-19            11-13-19 10:10

Released By      Date      Received By      Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30335301

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5389

Label	<u>DK</u>
LIMS Login	<u>DK</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals Intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None  
 Cooler Temperature    Observed Temp 1.4 °C    Correction Factor: 0 °C    Final Temp: 1.4 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>DK 11-13-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>no time/date on samples</u>
-Includes date/time/ID    Matrix: <u>MT</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Correct Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
-Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PM12</u>
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DK</u> Date/time of preservation:
All containers have been checked for preservation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lot # of added preservative:
exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>DK</u> Date: <u>11-13-19</u>
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Client Notification/ Resolution: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_  
 Person Contacted: \_\_\_\_\_  
 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.



## Certificate of Analysis 9103077

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:54

Project Name: MW-5 Wilson 092-00004

Workorder: 9103077

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoyslabs.com](http://www.mccoyslabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103077-01	MW5/	Water	11/06/2019 08:50	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>				<u>Value</u>
9103077-01	Field Conductance				3920
	Field pH				6.44
	Field Temp (C)				16.14

### ANALYTICAL RESULTS

Lab Sample ID: **9103077-01**  
 Description: **MW5**

Sample Collection Date Time: 11/06/2019 08:50  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Arsenic</b>	<b>0.0023</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Barium</b>	<b>0.010</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:53	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Calcium</b>	<b>541</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:06	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Iron</b>	<b>6.34</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:53	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Lithium</b>	<b>0.03</b>		mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Magnesium</b>	<b>233</b>	D1	mg/L	20.0	9.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:06	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Molybdenum</b>	<b>0.004</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Nickel</b>	<b>0.005</b>		mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Potassium</b>	<b>10.7</b>	D2	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:53	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
<b>Sodium</b>	<b>73.8</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 14:53	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 13:58	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>476</b>		mg/L	4		2320 B-2011	11/18/2019 11:01	11/18/2019 11:01	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:01	11/18/2019 11:01	HMF
<b>Total Alkalinity</b>	<b>476</b>		mg/L	4		2320 B-2011	11/18/2019 11:01	11/18/2019 11:01	HMF
<b>Chemical Oxygen Demand</b>	<b>16</b>		mg/L	5	5	HACH 8000	11/27/2019 16:47	11/27/2019 16:47	HMF
<b>Specific Conductance (Lab)</b>	<b>3380</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:41	11/22/2019 12:41	DJK
<b>Hardness as CaCO3</b>	<b>2300</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/12/2019 11:22	11/12/2019 11:22	ALT
<b>Total Dissolved Solids</b>	<b>3290</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:24	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.6</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/10/2019 14:53	HMF
<b>Total Organic Carbon</b>	<b>1.4</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 16:17	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.498</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.384</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>0.434</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	98.2	D	mg/L	25.0	18.0	EPA 300.0 REV 2.1	11/16/2019 02:21	11/16/2019 02:21	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 02:21	11/16/2019 02:21	CSC
Sulfate	1490	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/16/2019 02:21	11/16/2019 02:21	CSC

**Notes for work order 9103077**

- 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.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103077**

Shipped By: Client

Temperature: 1.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station

Project: **MW-5 Wilson 092-00004**

Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Phone: (270) 844-6000

PO#: 252822-32

PWS ID#:

State: KY

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Tommy Smith*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

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

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 9103077 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103077-01 A	<u>11-6-19</u>	<u>8:50</u>	Plastic 1L	1	MW5	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103077-01 B	<u>11-6-19</u>	<u>8:50</u>	Plastic 500mL pH<2 w/HNO3	1	MW5	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103077-01 C	<u>11-6-19</u>	<u>8:50</u>	Plastic 500mL pH<2 w/H2SO4	1	MW5	g / c	COD TOC
9103077-01 D	<u>11-6-19</u>	<u>8:50</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW5	g / c	Radium 226 (sub)

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check: pH: ✓

Preservation Check Performed by: NDY

Field data collected by: Tommy Smith Date (mm/dd/yy) 11-6-19 Time (24 hr) 8:50  
 pH 6.44 Cond (umho) 3920 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 16.14 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Tommy Smith</i></u>	Received by: (Signature) <u><i>May Yagor</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-5 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#: \_\_\_\_\_  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

MMLI USE ONLY *required information*		Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
Workorder #	Date Collection					
9103077 Sample ID#	(mm/dd/yy): Time (24 hr):					
9103077-01 E	<u>11-6-19 8:50</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 ✓	MW5	g / c	Radium 228 (sub)
9103077-01 F	<u>11-06-19 8:50</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1 ✓	MW5	g / c	Radium 228 (sub)
9103077-01 G	<u>11-06-19 8:50</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1 ✓	MW5	g / c	Radium Total (sub)

Preservation Check Performed by: *NOY*

Field data collected by: <u><i>Travis Sneed</i></u>	Date (mm/dd/yy) <u>11-06-19</u>	Time (24 hr) <u>8:50</u>
pH <u>6.44</u>	Cond (umho) <u>3920</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.14</u>	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Static Water Level _____	DO (mg/L) _____	Turb. (NTU) _____

Relinquished by: (Signature) <u><i>Travis Sneed</i></u>	Received by: (Signature) <u><i>May Yager</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

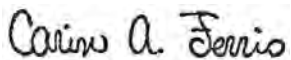
RE: Project: 9103077  
Pace Project No.: 30334690

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: 9103077  
Pace Project No.: 30334690

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103077  
Pace Project No.: 30334690

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334690001	9103077-01	Water	11/06/19 08:50	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

### SAMPLE ANALYTE COUNT

Project: 9103077  
Pace Project No.: 30334690

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334690001	9103077-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103077  
Pace Project No.: 30334690

**Sample: 9103077-01**      **Lab ID: 30334690001**      Collected: 11/06/19 08:50      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.0498 ± 0.259 (0.537)</b> C:NA T:94%	pCi/L	12/02/19 11:26	13982-63-3	
Radium-228	EPA 904.0	<b>0.384 ± 0.263 (0.501)</b> C:89% T:99%	pCi/L	11/27/19 11:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.434 ± 0.522 (1.04)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103077  
Pace Project No.: 30334690

---

QC Batch: 370980	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30334690001	

---

METHOD BLANK: 1800091	Matrix: Water
Associated Lab Samples: 30334690001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0321 ± 0.281 (0.648) C:85% T:88%	pCi/L	11/27/19 11:14	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103077  
Pace Project No.: 30334690

QC Batch:	370981	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	30334690001		

METHOD BLANK:	1800092	Matrix:	Water
Associated Lab Samples:	30334690001		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0408 ± 0.330 (0.647) C:NA T:94%	pCi/L	12/02/19 10:59	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103077  
Pace Project No.: 30334690

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103077      Workorder Name: MW-5 Wilson 092-00004      Owner Received Date: 11/7/2019      Results Requested By:   
 Report To: \_\_\_\_\_      Subcontract To: \_\_\_\_\_      Requested Analysis: \_\_\_\_\_

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY	
1	9103077-01		11/06/19 08:50	IR44-McCoy	Water				X	EPA 903.0
2									X	EPA 903.1
3									X	EPA 904.0
4										
5										
6										
7										
8										
9										
10										

WO#: 30334690



Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	11-8-19 1400	<i>[Signature]</i>	11-9-19 16:00	
2					
3					

Cooler Temperature on Receipt 4.3 °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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103077**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal


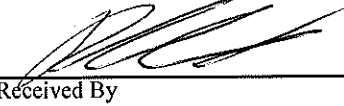
**RECEIVING LABORATORY:**

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
<b>Sample ID: 9103077-01</b>	<b>Water</b>	<b>Sampled: 11/06/2019 08:50</b>	<b>Specific Method</b>
Radium Total (sub)	05/04/2020 08:50	EPA 903.0	
Radium 228 (sub)	05/04/2020 08:50	EPA 904.0	
Radium 226 (sub)	05/04/2020 08:50	EPA 903.1	

#-30334690

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30334690

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other

Tracking #: 1107 3385 5275

Label	<u>PM</u>
LIMS Login	<u>PM</u>

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 8.3 °C Correction Factor: 0 °C Final Temp: 8.3 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1000391</u>			Date and Initials of person examining contents: <u>PM 11-11-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID Matrix: <u>nt</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>Matched date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PMc2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PMc</u> Date/time of preservation:
				Lot # of added preservative
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PMc</u> Date: <u>11-11-19</u>

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.

## Certificate of Analysis 9103079

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:52

Project Name: MW-7 Wilson 092-00004

Workorder: 9103079

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

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#460210  
Madisonville



Angela Deal, Project Manager

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

## Certificate of Analysis 9103078

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:53

Project Name: MW-6 Wilson 092-00004

Workorder: 9103078

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

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#460210  
Madisonville



Angela Deal, 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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 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103078-01	MW6/	Water	11/06/2019 11:20	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103078-01	Field Conductance	3410			
	Field pH	6.29			
	Field Temp (C)	16.38			

### ANALYTICAL RESULTS

Lab Sample ID: **9103078-01**  
 Description: **MW6**

Sample Collection Date Time: 11/06/2019 11:20  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Arsenic</b>	<b>0.0060</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Barium</b>	<b>0.012</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
Boron	ND	D2, u	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:09	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Calcium</b>	<b>482</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:12	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Iron</b>	<b>6.25</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:09	AKB
<b>Lead</b>	<b>0.0005</b>	J	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Lithium</b>	<b>0.04</b>		mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Magnesium</b>	<b>222</b>	D1	mg/L	20.0	9.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:12	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Molybdenum</b>	<b>0.007</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Nickel</b>	<b>0.017</b>		mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Potassium</b>	<b>10.2</b>	D2	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:09	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
<b>Sodium</b>	<b>41.2</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:09	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:06	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>498</b>		mg/L	4		2320 B-2011	11/18/2019 11:08	11/18/2019 11:08	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:08	11/18/2019 11:08	HMF
<b>Total Alkalinity</b>	<b>498</b>		mg/L	4		2320 B-2011	11/18/2019 11:08	11/18/2019 11:08	HMF
<b>Chemical Oxygen Demand</b>	<b>15</b>		mg/L	5	5	HACH 8000	11/27/2019 16:47	11/27/2019 16:47	HMF
<b>Specific Conductance (Lab)</b>	<b>3220</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:06	11/22/2019 12:06	DJK
<b>Hardness as CaCO3</b>	<b>2030</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/12/2019 11:24	11/12/2019 11:24	ALT
<b>Total Dissolved Solids</b>	<b>3170</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:28	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.3</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/10/2019 15:16	HMF
<b>Total Organic Carbon</b>	<b>1.4</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 16:38	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.255</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>1.16</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>1.42</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	16.3		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/16/2019 02:54	11/16/2019 02:54	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 02:54	11/16/2019 02:54	CSC
Sulfate	1280	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/16/2019 02:54	11/16/2019 02:54	CSC

**Notes for work order 9103078**

- 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.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103078**

Shipped By: Client

Temperature: 1.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>



# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-6 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Sneed*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

MMLI USE ONLY Workorder # Sample ID#	*required information* Date (mm/dd/yy): Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103078-01 A	<u>11-06-19</u> <u>11:20</u>	Plastic 1L	1	MW6	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103078-01 B	<u>11-06-19</u> <u>11:20</u>	Plastic 500mL pH<2 w/HNO3	1	MW6	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103078-01 C	<u>11-06-19</u> <u>11:20</u>	Plastic 500mL pH<2 w/H2SO4	1	MW6	g / c	COD TOC
9103078-01 D	<u>11-06-19</u> <u>11:20</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW6	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: NPY

Field data collected by: Travis Sneed Date (mm/dd/yy) 11-06-19 Time (24 hr) 11:20  
 pH 6.29 Cond (umho) 3410 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_  
 Temp (oC) 16.38 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_  
 Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) *Travis Sneed* Received by: (Signature) *May Year* Date (mm/dd/yy) 11-07-19 Time (24 hr) 1520

# Chain of Custody

**Scheduled for: 10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station

Project: **MW-6 Wilson 092-00004**

Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Phone: (270) 844-6000

PWS ID#:

PO#: 252827-37

State: KY

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103078-01 E	<u>11-06-19</u>	<u>11:20</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u>	MW6	g/c	Radium 228 (sub)
9103078-01 F	<u>11-06-19</u>	<u>11:20</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u>	MW6	g/c	Radium 228 (sub)
9103078-01 G	<u>11-06-19</u>	<u>11:20</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	<u>1</u>	MW6	g/c	Radium Total (sub)

Preservation Check Performed by: NPY

Field data collected by: Travis Sneed Date (mm/dd/yy) 11-06-19 Time (24 hr) 11:20

pH 6.29 Cond (umho) 3410 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 16.38 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) Travis Sneed Received by: (Signature) May Geyer Date (mm/dd/yy) 11-07-19 Time (24 hr) 1520

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

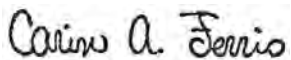
RE: Project: 9103078  
Pace Project No.: 30334700

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 9103078  
Pace Project No.: 30334700

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103078  
Pace Project No.: 30334700

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334700001	9103078-01	Water	11/06/19 11:20	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9103078  
Pace Project No.: 30334700

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334700001	9103078-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103078  
Pace Project No.: 30334700

**Sample: 9103078-01**      **Lab ID: 30334700001**      Collected: 11/06/19 11:20      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.255 ± 0.361 (0.612)</b> C:NA T:96%	pCi/L	12/03/19 11:06	13982-63-3	
Radium-228	EPA 904.0	<b>1.16 ± 0.465 (0.726)</b> C:76% T:87%	pCi/L	12/02/19 16:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>1.42 ± 0.826 (1.34)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103078

Pace Project No.: 30334700

QC Batch: 370987

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 30334700001

METHOD BLANK: 1800103

Matrix: Water

Associated Lab Samples: 30334700001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103078  
Pace Project No.: 30334700

---

QC Batch: 370988	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30334700001	

---

METHOD BLANK: 1800104	Matrix: Water
Associated Lab Samples: 30334700001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0385 ± 0.251 (0.505) C:NA T:92%	pCi/L	12/03/19 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103078  
Pace Project No.: 30334700

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Workorder: 9103078      Workorder Name: MW-6 Wilson 092-00004      Owner Received Date: 11/7/2019      Results Requested By: [Redacted]  
 Report To: [Redacted]      Subcontract To: [Redacted]      Requested Analysis: [Redacted]

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1	9103078-01		11/06/19 11:20	IR44-McCoy	Water	X	X	X	C-01
2									
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334700



Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	[Signature]	11-8-19 1400	[Signature]	11-9-19 10:00	
2					
3					

Cooler Temperature on Receipt 10.5 °C      Custody Seal Y or N      Received on Ice X 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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103078**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Angela Deal


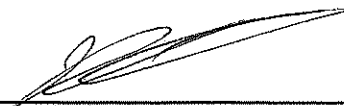
**RECEIVING LABORATORY:**

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: 9103078-01	Water	Sampled: 11/06/2019 11:20	Specific Method
Radium Total (sub)	05/04/2020 11:20	EPA 903.0	
Radium 228 (sub)	05/04/2020 11:20	EPA 904.0	
Radium 226 (sub)	05/04/2020 11:20	EPA 903.1	

**#-30334700**

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # -30334700

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label	<u>PK</u>
LIMS Login	<u>PK</u>

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 10.8 °C    Correction Factor: 0 °C    Final Temp: 10.8 °C

Temp should be above freezing to 8°C

Comments:	pH paper Lot# <u>1000391</u>			Date and Initials of person examining contents: <u>PK 11-11-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>WT</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>NO time/place on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>pkc2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u> Date: <u>11-11-19</u>

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.

## Certificate of Analysis 9103079

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:52

Project Name: MW-7 Wilson 092-00004

Workorder: 9103079

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/07/2019 15:20.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoyslabs.com](http://www.mccoyslabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



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 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9103079-01	MW7/	Water	11/07/2019 08:00	11/07/2019 15:20	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9103079-01	Field Conductance	2220			
	Field pH	6.59			
	Field Temp (C)	15.27			

### ANALYTICAL RESULTS

Lab Sample ID: **9103079-01**  
 Description: **MW7**

Sample Collection Date Time: 11/07/2019 08:00  
 Sample Received Date Time: 11/07/2019 15:20

#### 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	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Arsenic</b>	<b>0.0034</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Barium</b>	<b>0.013</b>		mg/L	0.004	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Boron</b>	<b>1.41</b>	D2	mg/L	1.00	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:15	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Calcium</b>	<b>331</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:19	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Iron</b>	<b>5.45</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:15	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Lithium</b>	<b>0.02</b>		mg/L	0.02	0.005	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Magnesium</b>	<b>91.5</b>	D2	mg/L	2.00	0.900	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:15	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Molybdenum</b>	<b>0.006</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Nickel</b>	<b>0.005</b>		mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Potassium</b>	<b>6.40</b>	D2	mg/L	5.00	2.20	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:15	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
<b>Sodium</b>	<b>34.0</b>	D2	mg/L	2.60	1.00	SW846 6010 B	11/08/2019 12:26	11/13/2019 15:15	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/08/2019 12:26	11/12/2019 14:13	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>311</b>		mg/L	4		2320 B-2011	11/18/2019 11:18	11/18/2019 11:18	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:18	11/18/2019 11:18	HMF
<b>Total Alkalinity</b>	<b>311</b>		mg/L	4		2320 B-2011	11/18/2019 11:18	11/18/2019 11:18	HMF
<b>Chemical Oxygen Demand</b>	<b>9</b>		mg/L	5	5	HACH 8000	11/27/2019 16:47	11/27/2019 16:47	HMF
<b>Specific Conductance (Lab)</b>	<b>1980</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:45	11/22/2019 12:45	DJK
<b>Hardness as CaCO3</b>	<b>1360</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/12/2019 11:26	11/12/2019 11:26	ALT
<b>Total Dissolved Solids</b>	<b>1890</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:32	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>1.5</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/10/2019 15:39	HMF
<b>Total Organic Carbon</b>	<b>1.1</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:50	11/12/2019 17:00	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>0.374</b>	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.490</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>0.864</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND



**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>30.1</b>		mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/16/2019 04:00	11/16/2019 04:00	CSC
<b>Fluoride</b>	<b>0.21</b>		mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 04:00	11/16/2019 04:00	CSC
<b>Sulfate</b>	<b>809</b>	D	mg/L	50.0	25.0	EPA 300.0 REV 2.1	11/16/2019 04:00	11/16/2019 04:00	CSC

**Notes for work order 9103079**

- 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.
- 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).
- Y1 Sample RPD exceeded the method control limit.

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9103079**

Shipped By: Client

Temperature: 1.90° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station

Project: **MW-7 Wilson 092-00004**

Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Tina Smith*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

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

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # 9103079 Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103079-01 A	<u>11-07-19</u>	<u>8:00</u>	Plastic 1L	1	MW7	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9103079-01 B	<u>11-07-19</u>	<u>8:00</u>	Plastic 500mL pH<2 w/HNO3	1	MW7	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9103079-01 C	<u>11-07-19</u>	<u>8:00</u>	Plastic 500mL pH<2 w/H2SO4	1	MW7	g / c	COD TOC
9103079-01 D	<u>11-07-19</u>	<u>8:00</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	MW7	g / c	Radium 226 (sub)

Preservation Check: pH:

Preservation Check: pH:

Preservation Check: pH:

Preservation Check Performed by: NDY

1.9

Field data collected by: Tina Smith Date (mm/dd/yy) 11-07-19 Time (24 hr) 8:00

pH 6.59 Cond (umho) 2,220 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Tina Smith</i></u>	Received by: (Signature) <u><i>May Young</i></u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **MW-7 Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: KY

PO#: 252827-37  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Speed  
\*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9103079-01 E	<u>11-07-19</u>	<u>8:00</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium 228 (sub)
9103079-01 F	<u>11-07-19</u>	<u>8:00</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium 228 (sub)
9103079-01 G	<u>11-07-19</u>	<u>8:00</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	MW7	g / c	Radium Total (sub)

Preservation Check Performed by: NDY

Field data collected by: Travis Speed Date (mm/dd/yy) 11-07-19 Time (24 hr) 8:00

pH 6.54 Cond (umho) 2,220 Res Cl (mg/L) \_\_\_\_\_ Tot Cl (mg/L) \_\_\_\_\_ Free Cl (mg/L) \_\_\_\_\_

Temp (oC) 15.27 or (oF) \_\_\_\_\_ Static Water Level \_\_\_\_\_ DO (mg/L) \_\_\_\_\_ Turb. (NTU) \_\_\_\_\_

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Speed</u>	Received by: (Signature) <u>May Yung</u>	Date (mm/dd/yy) <u>11-07-19</u>	Time (24 hr) <u>1520</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

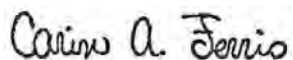
RE: Project: 9103079  
Pace Project No.: 30334698

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 9103079  
Pace Project No.: 30334698

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9103079  
Pace Project No.: 30334698

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334698001	9103079-01	Water	11/07/19 08:00	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: 9103079  
Pace Project No.: 30334698

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334698001	9103079-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9103079

Pace Project No.: 30334698

**Sample: 9103079-01**      **Lab ID: 30334698001**      Collected: 11/07/19 08:00      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.374 ± 0.317 (0.393)</b> C:NA T:90%	pCi/L	12/03/19 11:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.490 ± 0.329 (0.627)</b> C:82% T:92%	pCi/L	12/02/19 16:14	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.864 ± 0.646 (1.02)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: 9103079  
Pace Project No.: 30334698

---

QC Batch: 370987	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30334698001	

---

METHOD BLANK: 1800103	Matrix: Water
Associated Lab Samples: 30334698001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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**

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9103079  
Pace Project No.: 30334698

QC Batch: 370988	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30334698001	

METHOD BLANK: 1800104	Matrix: Water
Associated Lab Samples: 30334698001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0385 ± 0.251 (0.505) C:NA T:92%	pCi/L	12/03/19 11:06	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9103079  
Pace Project No.: 30334698

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

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Chain of Custody



Workorder: 9103079      Workorder Name: MW-7 Wilson 092-00004      Owner Received Date: 11/7/2019      Results Requested By:   
 Report To: \_\_\_\_\_      Subcontract To: \_\_\_\_\_      Requested Analysis: \_\_\_\_\_

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1	9103079-01		11/07/19 08:00	IR44-McCoy	Water	X	X	X	CG
2									
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334698

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	11-8-19 1300	<i>[Signature]</i>	11-9-19 1600	
2					
3					

Cooler Temperature on Receipt 8.6 °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**  
**McCoy & McCoy Laboratories, Inc.**  
**9103079**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
PO BOX 907  
Madisonville, KY 42431  
Phone: (270) 821-7375  
Fax: 844-270-7904  
Project Manager: Angela Deal


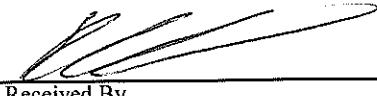
**RECEIVING LABORATORY:**

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: 9103079-01	Water	Sampled: 11/07/2019 08:00	Specific Method
Radium Total (sub)	05/05/2020 08:00	EPA 903.0	
Radium 228 (sub)	05/05/2020 08:00	EPA 904.0	
Radium 226 (sub)	05/05/2020 08:00	EPA 903.1	

# 30334698

	11-8-19		11-9-19 18:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # #-30334698

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label	<u>PK</u>
LIMS Login	<u>PK</u>

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 8.6 °C    Correction Factor: 0 °C    Final Temp: 8.6 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot#			Date and Initials of person examining contents: <u>PK 11-11-09</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID                      Matrix: <u>ut</u>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. <u>no time/date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>pkz</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u> Date/time of preservation: _____ Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PK</u> Date: <u>11-11-09</u>

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.

## Certificate of Analysis 9104081

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/06/2019 15:36

Project Name: Field Blank Wilson 092-00004

Workorder: 9104081

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/08/2019 15:35.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoylabs.com](http://www.mccoylabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville

A handwritten signature in black ink that reads "Angela Deal".

Angela Deal, Project Manager

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





P.O. Box 907  
Madisonville, KY 42431  
270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

### SAMPLE SUMMARY

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9104081-01	Field Blank/	Water	11/08/2019 14:10	11/08/2019 15:35	Travis Sneed

### ANALYTICAL RESULTS

Lab Sample ID: **9104081-01**  
 Description: **Field Blank**

Sample Collection Date Time: 11/08/2019 14:10  
 Sample Received Date Time: 11/08/2019 15:35

#### 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	11/11/2019 11:47	11/13/2019 15:17	DMH
Arsenic	ND	u	mg/L	0.0010	0.0004	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Barium	ND	u	mg/L	0.004	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Boron	ND	u	mg/L	0.10	0.10	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
Cadmium	ND	u	mg/L	0.0010	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Calcium	ND	u	mg/L	0.40	0.13	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Iron	ND	u	mg/L	0.100	0.050	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
<b>Lead</b>	<b>0.0006</b>	<b>J</b>	mg/L	0.002	0.0005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Lithium	ND	u	mg/L	0.02	0.005	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Magnesium	ND	u	mg/L	0.200	0.090	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Molybdenum	ND	u	mg/L	0.01	0.002	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Nickel	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Potassium	ND	L1, U	mg/L	0.50	0.22	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Sodium	ND	u	mg/L	0.26	0.10	SW846 6010 B	11/11/2019 11:47	11/15/2019 14:52	AKB
Thallium	ND	u	mg/L	0.0020	0.0001	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH
Zinc	ND	u	mg/L	0.02	0.02	SW846-6020 A	11/11/2019 11:47	11/13/2019 15:17	DMH

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Bicarbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:24	11/18/2019 11:24	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:24	11/18/2019 11:24	HMF
Total Alkalinity	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:24	11/18/2019 11:24	HMF
Chemical Oxygen Demand	ND	u	mg/L	5	5	HACH 8000	11/27/2019 18:50	11/27/2019 18:50	HMF
<b>Specific Conductance (Lab)</b>	<b>1</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:07	11/22/2019 12:07	DJK
Hardness as CaCO3	ND	u	mg/L	1	1	2340 C (as HACH 8226)	11/12/2019 11:28	11/12/2019 11:28	ALT
<b>Total Dissolved Solids</b>	<b>372</b>		mg/L	50	50	2540 C-2011	11/12/2019 17:36	11/13/2019 16:26	MAG
<b>Total Organic Carbon</b>	<b>0.5</b>		mg/L	0.5		5310 C-2011	11/11/2019 16:27	11/13/2019 02:00	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Radium-226</b>	<b>-0.093</b>	<b>_Sub</b>	pCi/L			EPA 903.1	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium-228</b>	<b>0.102</b>	<b>_Sub</b>	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND
<b>Radium</b>	<b>0.102</b>	<b>_Sub</b>	pCi/L			EPA 904.0 Radium Sum Calc	12/06/2019 13:37	12/06/2019 13:38	AND

**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Chloride	ND	u	mg/L	0.5	0.4	EPA 300.0 REV 2.1	11/16/2019 04:33	11/16/2019 04:33	CSC
Fluoride	ND	u	mg/L	0.20		EPA 300.0 REV 2.1	11/16/2019 04:33	11/16/2019 04:33	CSC
Sulfate	ND	u	mg/L	1.0	0.5	EPA 300.0 REV 2.1	11/16/2019 04:33	11/16/2019 04:33	CSC

**Notes for work order 9104081**

- 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.
- D2 Sample required dilution due to matrix interference.
- J Estimated value.
- L1 The associated blank spike recovery was above method acceptance limits.
- M1 Matrix spike recovery was high; the method control sample recovery was acceptable.
- M2 Matrix spike recovery was low; the method control sample recovery was acceptable.
- 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/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9104081**

Shipped By: Client

Temperature: 1.60° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

Scheduled for: **10/14/2019**



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **Field Blank Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: ky

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

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

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9104081-01 A	<u>11-08-19</u>	<u>14:10</u>	Plastic 1L	1	Field Blank	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9104081-01 B	<u>11-08-19</u>	<u>14:10</u>	Plastic 500mL pH<2 w/HNO3	1	Field Blank	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
			Preservation Check: pH: <u>✓</u>				
9104081-01 C	<u>11-08-19</u>	<u>14:10</u>	Plastic 500mL pH<2 w/H2SO4	1	Field Blank	g / c	COD TOC
			Preservation Check: pH: <u>✓</u>				
9104081-01 D	<u>11-08-19</u>	<u>14:10</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Field Blank	g / c	Radium 226 (sub)
			Preservation Check: pH: <u>✓</u>				

Preservation Check Performed by: NDY

1.6

Field data collected by: Travis Sneed Date (mm/dd/yy) 11-08-19 Time (24 hr) 14:10

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

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

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>May Yager</u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **Field Blank Wilson 092-00004**

Phone: (270) 844-6000  
 PWS ID#:  
 State: 197

PO#: 252827-35  
 Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): *Travis Speed*  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

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

Samples Chlorinated? Yes \_\_\_ No \_\_\_

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9104081-01 E	<u>11-08-19</u>	<u>14:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	Field Blank	g / c	Radium 228 (sub)
9104081-01 F	<u>11-08-19</u>	<u>14:10</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: _____	1	Field Blank	g / c	Radium 228 (sub)
9104081-01 G	<u>11-08-19</u>	<u>14:10</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	Field Blank	g / c	Radium Total (sub)

Preservation Check Performed by: NDY

Field data collected by: Travis Speed Date (mm/dd/yy) 11-08-19 Time (24 hr) 14:10

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

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

Flow (MGD) \_\_\_\_\_ or (CFS) \_\_\_\_\_ or (g/min) \_\_\_\_\_

Relinquished by: (Signature) <u><i>Travis Speed</i></u>	Received by: (Signature) <u><i>May Upson</i></u>	Date (mm/dd/yy) <u>11-08-19</u>	Time (24 hr) <u>1535</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 06, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

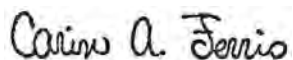
RE: Project: 9104081  
Pace Project No.: 30335312

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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## CERTIFICATIONS

Project: 9104081  
Pace Project No.: 30335312

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9104081  
Pace Project No.: 30335312

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30335312001	9104081-01	Water	11/08/19 14:10	11/13/19 10:10

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9104081  
Pace Project No.: 30335312

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30335312001	9104081-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9104081  
Pace Project No.: 30335312

**Sample: 9104081-01**      **Lab ID: 30335312001**      Collected: 11/08/19 14:10      Received: 11/13/19 10:10      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
Radium-226	EPA 903.1	<b>-0.0930 ± 0.605 (1.10)</b> <b>C:NA T:90%</b>	pCi/L	12/06/19 11:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.102 ± 0.330 (0.749)</b> <b>C:72% T:79%</b>	pCi/L	12/04/19 14:17	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.102 ± 0.935 (1.85)</b>	pCi/L	12/06/19 13:24	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9104081  
Pace Project No.: 30335312

---

QC Batch: 371026	Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1	Analysis Description: 903.1 Radium-226
Associated Lab Samples: 30335312001	

---

METHOD BLANK: 1800179 Matrix: Water  
Associated Lab Samples: 30335312001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.139 ± 0.459 (0.772) C:NA T:92%	pCi/L	12/06/19 10:57	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9104081  
Pace Project No.: 30335312

---

QC Batch: 371027	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 30335312001	

---

METHOD BLANK: 1800180	Matrix: Water
Associated Lab Samples: 30335312001	

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.969 ± 0.446 (0.738) C:81% T:74%	pCi/L	12/04/19 11:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 9104081  
Pace Project No.: 30335312

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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Workorder: 9104081  
Report To:

Workorder Name: Field Blank Wilson 092-000  
Subcontract To:

Owner Received Date: 11/8/2019

Results Requested By:

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

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

Requested Analysis

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1									
2	9104081-01		11/08/19 14:10	IR44-McCoy	Water	X	X	X	
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30335312



Transfers Released By

Date/Time

Received By

Date/Time

Comments

Cooler Temperature on Receipt 6.3 °C

Custody Seal Y or (N)

Received on Ice Y or N

Sample Intact Y or N

This chain of custody is considered complete as is since this information is available in the owner laboratory.

Friday, June 17, 2016 11:01:34 AM

FMT-ALL-C-002 rev.00 24March2009

**SUBCONTRACT ORDER**  
**McCoy & McCoy Laboratories, Inc.**  
**9104081**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal

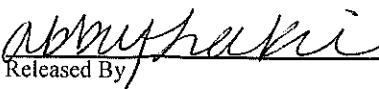
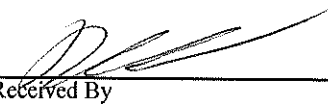
**RECEIVING LABORATORY:**

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
<b>Sample ID: 9104081-01</b>	<b>Water</b>	<b>Sampled: 11/08/2019 14:10</b>	<b>Specific Method</b>
Radium Total (sub)	05/06/2020 14:10	EPA 903.0	
Radium 228 (sub)	05/06/2020 14:10	EPA 904.0	
Radium 226 (sub)	05/06/2020 14:10	EPA 903.1	

**#-30335312**


11-11-19

11-13-19 10:19

Released By \_\_\_\_\_ Date \_\_\_\_\_ Received By \_\_\_\_\_ Date \_\_\_\_\_



Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30335312

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5389

Label	<u>PM</u>
LIMS Login	<u>PM</u>

Custody Seal on Cooler/Box Present:  yes  no    Seals Intact:  yes  no

Thermometer Used 9    Type of Ice:  Wet  Blue  None

Cooler Temperature Observed Temp 1.3 °C    Correction Factor: 0 °C    Final Temp: 1.3 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1E00391</u>			Date and initials of person examining contents: <u>PM 11-13-09</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID    Matrix: <u>WT</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. <u>no time/date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>PM102</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	17.
Trip Blank Present:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date: <u>11-13-09</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

A check in this box indicates that additional information has been stored in eports.

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.

## Certificate of Analysis 9104082

Mike Galbraith  
Big Rivers Electric Corporation Wilson Station  
PO Box 24  
Henderson KY, 42419

Customer ID: 44-100168  
Report Printed: 12/04/2019 16:52

Project Name: Well Duplicate Wilson 092-00004

Workorder: 9104082

Dear Mike Galbraith

Enclosed are the analytical results for samples received at one of our laboratories on 11/04/2019 16:05.

McCoy & McCoy Laboratories, Inc. 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 visit our website at [www.mccoyslabs.com](http://www.mccoyslabs.com) for a listing of the NELAP accreditations and Scope of Work, as well as, links to other scientific organizations.

This certificate of analysis may not be reproduced without the written consent of McCoy & McCoy Laboratories, Inc.



#460210  
Madisonville



Angela Deal, Project Manager

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



P.O. Box 907  
 Madisonville, KY 42431  
 270.821.7375  
[www.mccoylabs.com](http://www.mccoylabs.com)

Pikeville, KY Farmersburg, IN  
 606.432.3104 812.696.5076

Lexington, KY Paducah, KY  
 859.299.7775 270.444.6547

"Providing Tomorrow's Analytical Capabilities Today"

**SAMPLE SUMMARY**

Lab ID	Client Sample ID/Alias	Matrix	Date Collected	Date Received	Sampled By
9104082-01	Well Duplicate/	Water	11/04/2019 13:22	11/04/2019 16:05	Travis Sneed
<u>LabNumber</u>	<u>Measurement</u>	<u>Value</u>			
9104082-01	Field Conductance	3660			
	Field pH	5.10			
	Field Temp (C)	16.77			

### ANALYTICAL RESULTS

Lab Sample ID: **9104082-01**  
 Description: **Well Duplicate**

Sample Collection Date Time: 11/04/2019 13:22  
 Sample Received Date Time: 11/04/2019 16:05

#### 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	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Arsenic</b>	<b>0.0014</b>		mg/L	0.0010	0.0004	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Barium</b>	<b>0.005</b>		mg/L	0.004	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
Beryllium	ND	u	mg/L	0.0020	0.0010	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
Boron	ND	u, D2	mg/L	1.00	1.00	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:53	AKB
<b>Cadmium</b>	<b>0.0078</b>		mg/L	0.0010	0.0001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Calcium</b>	<b>479</b>	D1	mg/L	40.0	13.0	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:56	AKB
Chromium	ND	u	mg/L	0.0020	0.0006	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
Copper	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Iron</b>	<b>72.9</b>	D2	mg/L	1.00	0.500	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:53	AKB
Lead	ND	u	mg/L	0.002	0.0005	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Lithium</b>	<b>0.14</b>		mg/L	0.02	0.005	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:34	DBP
<b>Magnesium</b>	<b>193</b>	D1	mg/L	20.0	9.00	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:56	AKB
Mercury	ND	u	mg/L	0.0005	0.0002	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Molybdenum</b>	<b>0.002</b>	J	mg/L	0.01	0.002	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Nickel</b>	<b>0.823</b>		mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Potassium</b>	<b>11.9</b>	D2	mg/L	5.00	2.20	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:53	AKB
Selenium	ND	u	mg/L	0.003	0.001	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:34	DBP
<b>Sodium</b>	<b>107</b>	D1	mg/L	26.0	10.0	SW846 6010 B	11/06/2019 09:00	11/07/2019 15:56	AKB
<b>Thallium</b>	<b>0.0004</b>	J	mg/L	0.0020	0.0001	SW846-6020 A	11/06/2019 09:00	11/06/2019 16:49	DMH
<b>Zinc</b>	<b>1.42</b>	D1	mg/L	0.20	0.20	SW846-6020 A	11/06/2019 09:00	11/07/2019 11:38	DBP

#### Conventional Chemistry Analyses Madisonville

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>32</b>		mg/L	4		2320 B-2011	11/18/2019 11:26	11/18/2019 11:26	HMF
Carbonate Alkalinity as CaCO3	ND	u	mg/L	4		2320 B-2011	11/18/2019 11:26	11/18/2019 11:26	HMF
<b>Total Alkalinity</b>	<b>32</b>		mg/L	4		2320 B-2011	11/18/2019 11:26	11/18/2019 11:26	HMF
<b>Chemical Oxygen Demand</b>	<b>60</b>		mg/L	5	5	HACH 8000	11/19/2019 16:22	11/19/2019 16:22	HMF
<b>Specific Conductance (Lab)</b>	<b>3520</b>		umhos/cm	1	1	2510 B-2011	11/22/2019 12:08	11/22/2019 12:08	DJK
<b>Hardness as CaCO3</b>	<b>1960</b>	D	mg/L	5	5	2340 C (as HACH 8226)	11/07/2019 09:22	11/07/2019 09:22	ALT
<b>Total Dissolved Solids</b>	<b>43100</b>		mg/L	50	50	2540 C-2011	11/05/2019 15:50	11/06/2019 16:31	MAG
<b>Total Organic Carbon</b>	<b>1.1</b>		mg/L	0.5		5310 C-2011	11/07/2019 13:33	11/08/2019 05:18	HMF

#### Subcontracted Analyses

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
Radium-226	0.00	_Sub	pCi/L			EPA 903.1	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium-228</b>	<b>0.331</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND
<b>Radium</b>	<b>0.331</b>	_Sub	pCi/L			EPA 904.0 Radium Sum Calc	12/04/2019 10:56	12/04/2019 10:58	AND



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**Ion Chromatography Madisonville**

Analyte	Result	Flag	Units	MRL	MDL	Method	Prepared	Analyzed	Analyst
<b>Chloride</b>	<b>90.2</b>	D, M2	mg/L	25.0	18.0	EPA 300.0 REV 2.1	11/11/2019 15:07	11/11/2019 15:07	CSC
<b>Fluoride</b>	<b>2.06</b>	M2	mg/L	0.20		EPA 300.0 REV 2.1	11/11/2019 15:07	11/11/2019 15:07	CSC
<b>Sulfate</b>	<b>257</b>	D, M1	mg/L	100	50.0	EPA 300.0 REV 2.1	11/11/2019 15:07	11/11/2019 15:07	CSC

**Notes for work order 9104082**

- 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.   |
| E    | Concentration exceeds calibration range  |
| 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.  |
| 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).                    |

**Standard Qualifiers/Acronyms**

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

**Certified Analyses included in this Report**

Analyte	Certifications
<b>2320 B-2011 in Water</b>	
Bicarbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Carbonate Alkalinity as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
Total Alkalinity	KY Drinking Water Mdv (00030)
<b>2340 C (as HACH 8226) in Water</b>	
Hardness as CaCO <sub>3</sub>	KY Drinking Water Mdv (00030)
<b>2510 B-2011 in Water</b>	
Specific Conductance (Lab)	KY Drinking Water Mdv (00030)
<b>2540 C-2011 in Water</b>	
Total Dissolved Solids	KY Drinking Water Mdv (00030)
<b>5310 C-2011 in Water</b>	
Total Organic Carbon	KY Drinking Water Mdv (00030)
<b>EPA 300.0 REV 2.1 in Water</b>	
Chloride	KY Drinking Water Mdv (00030)
Fluoride	KY Drinking Water Mdv (00030)
Sulfate	KY Drinking Water Mdv (00030)
<b>HACH 8000 in Water</b>	
Chemical Oxygen Demand	KY Wastewater Mdv (00030)
<b>SW846 6010 B in Water</b>	

**Sample Acceptance Checklist for Work Order 9104082**

Shipped By: Client

Temperature: 1.20° Celcius

**Condition**

Check if Custody Seals are Present/Intact	<input type="checkbox"/>
Check if Custody Signatures are Present	<input checked="" type="checkbox"/>
Check if Collector Signature Present	<input checked="" type="checkbox"/>
Check if bottles are intact	<input checked="" type="checkbox"/>
Check if bottles are correct	<input checked="" type="checkbox"/>
Check if bottles have sufficient volume	<input checked="" type="checkbox"/>
Check if samples received on ice	<input checked="" type="checkbox"/>
Check if VOA headspace is acceptable	<input type="checkbox"/>
Check if samples received in holding time.	<input checked="" type="checkbox"/>
Check if samples are preserved properly	<input checked="" type="checkbox"/>

# Chain of Custody

**Scheduled for: 10/14/2019**



**Client:** Big Rivers Electric Corporation Wilson Station

**Report To:**  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

**Invoice To:**  
 Big Rivers Electric Corporation Wilson Station

**Project:** Well Duplicate Wilson 092-00004

Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Phone: (270) 844-6000

PO#: 252827-31

PWS ID#:

Quote# \_\_\_\_\_

Please Print Legibly

State: KY

Collected by (Signature): Travis Speed  
\*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 \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy)	Collection Time (24 hr)	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9104082-01 A	<u>11-04-19</u>	<u>13:22</u>	Plastic 1L	1	Well Duplicate	g / c	Alkalinity Total Chloride 300.0 Conductivity (Lab) Fluoride 300.0 Sulfate 300.0 Alkalinity Bicarbonate TDS Alkalinity Carbonate
9104082-01 B	<u>11-04-19</u>	<u>13:22</u>	Plastic 500mL pH<2 w/HNO3	1	Well Duplicate	g / c	Arsenic Tot 6020 Antimony Tot 6020 Barium Tot 6020 Iron Tot 6010B Selenium Tot 6020 Hardness Titration Beryllium Tot 6020 Boron Tot 6010B Cadmium Tot 6020 Calcium Tot 6010B Chromium Tot 6020 Sodium Tot 6010B Lead Tot 6020 Lithium Tot 6020 Mercury Tot 6020
9104082-01 C	<u>11-04-19</u>	<u>13:22</u>	Plastic 500mL pH<2 w/H2SO4	1	Well Duplicate	g / c	COD TOC
9104082-01 D	<u>11-04-19</u>	<u>13:22</u>	Plastic 1L pH<2 w/HNO3 Rad 226 (Sub)	1	Well Duplicate	g / c	Radium 226 (sub)

Preservation Check: pH: ✓  
 Preservation Check: pH: ✓  
 Preservation Check: pH: ✓

Preservation Check Performed by: NDY

Field data collected by: Travis Speed Date (mm/dd/yy) 11-04-19 Time (24 hr) 13:22  
 pH 5.10 Cond (umho) 3660 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) Travis Speed Received by: (Signature) May Gager Date (mm/dd/yy) 11-4-19 Time (24 hr) 1605



# Chain of Custody

Scheduled for: 10/14/2019



Client: **Big Rivers Electric Corporation Wilson Station**

Report To:  
 Big Rivers Electric Corporation Wilson Station  
 Mike Galbraith  
 PO Box 24  
 Henderson, KY 42419

Invoice To:  
 Big Rivers Electric Corporation Wilson Station  
 Brian Edwards  
 PO Box 24  
 Henderson, KY 42419

Project: **Well Duplicate Wilson 092-00004**

Phone: (270) 844-6000

PWS ID#:

State: KY

PO#: 252827-31

Quote# \_\_\_\_\_

Please Print Legibly

Collected by (Signature): Travis Sneed  
 \*required information\*

Compliance Monitoring? Yes \_\_\_ No \_\_\_

Samples Chlorinated? Yes \_\_\_ No \_\_\_

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

Influent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

Effluent: Start Date \_\_\_\_\_ Start time \_\_\_\_\_ End Date \_\_\_\_\_ End Time \_\_\_\_\_ Temp (oC) \_\_\_\_\_

**MMLI USE ONLY \*required information\***

Workorder # Sample ID#	Date (mm/dd/yy):	Collection Time (24 hr):	Bottle and Preservative	Containers	Sample Description	Composite	Sample Analysis Requested
9104082-01 E	<u>11-04-19</u>	<u>13:22</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	Well Duplicate	g / c	Radium 228 (sub)
9104082-01 F	<u>11-04-19</u>	<u>13:22</u>	Plastic 1L pH<2 w/HNO3 Rad 228 (Sub) Preservation Check: pH: <u>✓</u>	1	Well Duplicate	g / c	Radium 228 (sub)
9104082-01 G	<u>11-04-19</u>	<u>13:22</u>	Plastic 1L pH<2 w/HNO3 (Sub) Preservation Check: pH: <u>✓</u>	1	Well Duplicate	g / c	Radium Total (sub)

Preservation Check Performed by: NDY

Field data collected by: <u>Travis Sneed</u>	Date (mm/dd/yy) <u>11-04-19</u>	Time (24 hr) <u>13:22</u>
pH <u>5.10</u>	Cond (umho) <u>3660</u>	Res Cl (mg/L) _____
Temp (oC) <u>16.77</u>	or (oF) _____	Tot Cl (mg/L) _____
Flow (MGD) _____	or (CFS) _____	or (g/min) _____
Static Water Level _____	DO (mg/L) _____	Free Cl (mg/L) _____
	Turb. (NTU) _____	

Relinquished by: (Signature) <u>Travis Sneed</u>	Received by: (Signature) <u>May Geyer</u>	Date (mm/dd/yy) <u>11-06-19</u>	Time (24 hr) <u>1605</u>
_____	_____	_____	_____
_____	_____	_____	_____

December 04, 2019

Angela Deal  
Pace Analytical Madisonville  
825 Industrial Rd  
Madisonville, KY 42431

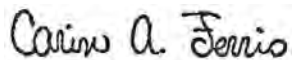
RE: Project: 9104082  
Pace Project No.: 30334695

Dear Angela Deal:

Enclosed are the analytical results for sample(s) received by the laboratory on November 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



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

Enclosures

cc: Doug Wolfe, Pace Analytical Madisonville



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 9104082

Pace Project No.: 30334695

### **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

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: 9104082  
Pace Project No.: 30334695

Lab ID	Sample ID	Matrix	Date Collected	Date Received
30334695001	9104082-01	Water	11/04/19 13:22	11/09/19 10:00

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 9104082  
Pace Project No.: 30334695

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
30334695001	9104082-01	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 9104082  
Pace Project No.: 30334695

**Sample: 9104082-01**      **Lab ID: 30334695001**      Collected: 11/04/19 13:22      Received: 11/09/19 10:00      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
Radium-226	EPA 903.1	<b>0.000 ± 0.322 (0.681)</b> C:NA T:91%	pCi/L	12/03/19 11:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.331 ± 0.306 (0.624)</b> C:82% T:94%	pCi/L	12/02/19 16:14	15262-20-1	
Total Radium	Total Radium Calculation	<b>0.331 ± 0.628 (1.31)</b>	pCi/L	12/04/19 09:28	7440-14-4	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: 9104082  
Pace Project No.: 30334695

---

QC Batch: 370987 Analysis Method: EPA 904.0  
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228  
Associated Lab Samples: 30334695001

---

METHOD BLANK: 1800103 Matrix: Water  
Associated Lab Samples: 30334695001

---

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.353 ± 0.347 (0.714) C:83% T:78%	pCi/L	12/02/19 16:13	

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

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## QUALIFIERS

Project: 9104082  
Pace Project No.: 30334695

### 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.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

Chain of Custody



Workorder: 9104082      Workorder Name: Well Duplicate Wilson 092      Owner Received Date: 11/4/2019      Results Requested By: Requested Analysis

McCoy & McCoy Labs  
 P.O. Box 907  
 Madisonville, KY 42409  
 270-821-7375  
 angela@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			LAB USE ONLY
						EPA 903.0	EPA 903.1	EPA 904.0	
1									
2	9104082-01		11/04/19 13:22	IR44-McCoy	Water	X	X	X	
3									
4									
5									
6									
7									
8									
9									
10									

WO#: 30334695

Transfers	Released By	Date/Time	Received By	Date/Time	Comments
1	<i>[Signature]</i>	11-8-19	<i>[Signature]</i>	11-9-19 16:00	
2					
3					

Cooler Temperature on Receipt 8.3 °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**  
**McCoy & McCoy Laboratories, Inc.**  
**9104082**

**SENDING LABORATORY:**

McCoy & McCoy Laboratories, Inc.  
 PO BOX 907  
 Madisonville, KY 42431  
 Phone: (270) 821-7375  
 Fax: 844-270-7904  
 Project Manager: Angela Deal


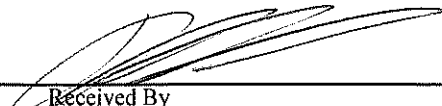
**RECEIVING LABORATORY:**

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

#-30334695

Please return shipping cooler to return address on shipping label.

Analysis	Expires	Laboratory ID	Comments
Sample ID: 9104082-01	Water	Sampled: 11/04/2019 13:22	Specific Method
Radium Total (sub)	05/02/2020 13:22	EPA 903.0	
Radium 228 (sub)	05/02/2020 13:22	EPA 904.0	
Radium 226 (sub)	05/02/2020 13:22	EPA 903.1	

	11-8-19		11-9-19 10:00
Released By	Date	Received By	Date
Released By	Date	Received By	Date

Pittsburgh Lab Sample Condition Upon Receipt



Client Name: McCoy & McCoy

Project # 30334695

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: 1107 3385 5275

Label	<u>PM</u>
LIMS Login	<u>PM</u>

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 8.3 °C      Correction Factor: 0 °C      Final Temp: 8.3 °C

Temp should be above freezing to 6°C

Comments:	pH paper Lot# <u>1000394</u>			Date and Initials of person examining contents: <u>PM 11-11-19</u>
	Yes	No	N/A	
Chain of Custody Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4.
Sample Labels match COC: -Includes date/time/ID      Matrix: <u>UAF</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	5. <u>no time/date on samples</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6.
Short Hold Time Analysis (<72hr remaining):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8.
Sufficient Volume:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	9.
Correct Containers Used: -Pace Containers Used:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	10.
Containers Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	11.
Orthophosphate field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	12.
Hex Cr Aqueous sample field filtered	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	13.
Organic Samples checked for dechlorination:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	14.
Filtered volume received for Dissolved tests	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	16. <u>pH 2</u>
All containers meet method preservation requirements.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date/time of preservation: _____
				Lot # of added preservative: _____
Headspace in VOA Vials (>6mm):	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	17.
Trip Blank Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	18.
Trip Blank Custody Seals Present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Rad Samples Screened < 0.5 mrem/hr	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Initial when completed: <u>PM</u> Date: <u>11-11-19</u>

Client Notification/ Resolution:

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Contacted By: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

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

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

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

**Appendix E**  
**Statistical Evaluation**

## 1.0 WILSON LANDFILL STATISTICAL PROCEDURES AND RESULTS

The Appendix III groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at a background monitoring well. For the D.B. Wilson landfill, monitoring well MW-8 is designated as the background well because it is located upgradient, whereas monitoring wells MW-5, MW-6, MW-7, and MW-10 are designated as compliance wells because they are located downgradient.

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 June 2016 and November 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 Appendix III and IV UPLs, are provided in **Tables E1** and **E2**.

The statistical analysis results indicate that Appendix III constituents calcium, chloride, sulfate, and total dissolved solids (TDS) at monitoring well MW-5; calcium, chloride, and TDS at monitoring well MW-6; boron, chloride, and TDS at monitoring well MW-7; and calcium, chloride, and TDS at monitoring well MW-10 have SSIs over background (**Table E3**) that were confirmed by subsequent sampling events. Fluoride and pH do not have any verified SSIs over background. Based on these results, detection monitoring is required to continue at the landfill on a semi-annual basis.

The statistical analysis results also indicate that Appendix IV constituents cobalt and lithium at monitoring wells MW-5, MW-6, and MW-7 and cobalt at monitoring well MW-10 have SSIs over background (**Table E4**) that were confirmed by subsequent sampling events. These constituents 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 (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 a SSL over the GWPS, its LCL must be greater than the GWPS. **Table E5** provides a summary of the LCLs and GWPS for cobalt and lithium at monitoring wells MW-5, MW-6, MW-7, and MW-10. The results indicate that lithium at monitoring well MW-6 and cobalt at monitoring well MW-10 (yellow highlights) are present at a SSL 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.

**Table E1. Well MW-8 Appendix III Constituents Background Upper Prediction Limits**

<b>Parameter (Units)</b>	<b>Number of Samples</b>	<b>Percent Non-detects</b>	<b>Normal or Lognormal Distribution?</b>	<b>Statistical Test</b>	<b>Background Limit</b>
Boron (mg/L)	12	17	Yes/No	Parametric	0.053
Calcium (mg/L)	12	0	No/No	Nonparametric	329
Chloride (mg/L)	12	0	Yes/Yes	Parametric	5.32
Fluoride (mg/L)	12	0	No/Yes	Parametric	0.79
pH (std units)	13	0	Yes/Yes	Parametric	6.13/6.73
Sulfate (mg/L)	12	0	No/No	Nonparametric	1480
TDS (mg/L)	12	0	Yes/Yes	Parametric	1679

**Table E2. Well MW-8 Appendix IV Constituents Background Upper Prediction Limits**

<b>Parameter (Units)</b>	<b>Number of Samples</b>	<b>Percent Non-detects</b>	<b>Normal or Lognormal Distribution?</b>	<b>Statistical Test</b>	<b>Background Limit (mg/L)</b>
Antimony (mg/L)	12	42	Yes/Yes	Parametric	0.0005
Arsenic (mg/L)	12	0	Yes/Yes	Parametric	0.009
Barium (mg/L)	12	0	Yes/Yes	Parametric	0.026
Beryllium (mg/L)	11	100	No/No	Nonparametric	0.02
Cadmium (mg/L)	11	100	No/No	Nonparametric	0.01
Chromium (mg/L)	12	75	No/No	Nonparametric	0.03
Cobalt (mg/L)	12	25	Yes/Yes	Parametric	0.0016
Fluoride (mg/L)	12	0	No/Yes	Parametric	0.79
Lead (mg/L)	12	92	No/No	Nonparametric	0.05
Lithium (mg/L)	12	33	Yes/Yes	Parametric	0.015
Mercury (mg/L)	11	100	No/No	Nonparametric	0.0002
Molybdenum (mg/L)	12	0	Yes/Yes	Parametric	0.0196
Ra-226+228 (pCi/L)	11	0	No/No	Nonparametric	2.8
Selenium (mg/L)	12	92	No/No	Nonparametric	0.1
Thallium (mg/L)	12	92	No/No	Nonparametric	0.01


**Table E3. Big Rivers D.B. Wilson Landfill Appendix III SSI Summary**

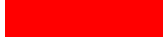
Well	Location	B	Ca	Cl	F	pH (LPL/UPL)		SO4	TDS
MW-8	Upgradient	P	NP	P	P	P	P	P	P
MW-5	Downgradient								
MW-6	Downgradient								
MW-7	Downgradient								
MW-10	Downgradient								

**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 E4. Big Rivers D.B. Wilson 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-8	Upgradient	NP	P	P	NP	NP	NP	P	P	NP	P	NP	P	P	NP	NP
MW-5	Downgradient															
MW-6	Downgradient															
MW-7	Downgradient															
MW-10	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 E5 Summary of LCLs and GWPS for Cobalt and Lithium**

<b>Well</b>	<b>Parameter</b>	<b>LCL</b>	<b>GWPS</b>
MW-5	Co	0.006	0.006
MW-6	Co	0.006	0.006
MW-7	Co	0.004	0.006
MW-10	Co	<b>0.082</b>	0.006
MW-5	Li	0.032	0.04
MW-6	Li	<b>0.042</b>	0.04
MW-7	Li	0.025	0.04