2022 Annual Groundwater Monitoring and Corrective Action Report

Secondary Ash Pond
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

Wisconsin Power and Light Company
4902 N. Biltmore Lane
Madison, Wisconsin 53718

SCS ENGINEERS

25222067.00 | August 1, 2023

2830 Dairy Drive
Madison, WI 53718-6751
608-224-2830

OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Secondary Ash Pond
2022 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) units. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was an SSI over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	SSIs initially determined on July 15, 2019, based on April 2019 monitoring results. In 2022, SSIs for semiannual events for compliance wells at the waste boundary included the following; see **Table 5** for complete results. <u>April 2022</u> Boron: MW-306, MW-307, MW-308 Calcium: MW-308 Chloride: MW-307 Sulfate: MW-307 Total Dissolved Solids (TDS): MW-307 <u>October 2022</u> Boron: MW-308

Category	Rule Requirement	Site Status
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	January 13, 2020
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in appendix IV to this part pursuant to §257.95(g) include all of the following:	
	(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	None
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Not applicable – No SSLs above GPSs
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	Not applicable – ACM not required
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	Not applicable – ACM not required
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable – Selection of remedy not required
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Selection of remedy not required

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1.0 INTRODUCTION

This 2022 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.100 and 40 CFR 257.90(e) for inactive CCR surface impoundments. The applicable sections of the Rule are provided below in *italic*s, followed by applicable information relative to the 2022 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

This report covers the period of groundwater monitoring from January 1, 2022, through December 31, 2022.

The groundwater monitoring system for the Secondary Ash Pond at the Columbia Energy Center (COL) monitors a single inactive CCR unit:

- COL Secondary Ash Pond (inactive surface impoundment)

The system is designed to detect monitored constituents at the waste boundary of the COL Secondary Ash Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two background wells and three downgradient monitoring wells (**Table 1**, **Figure 1**, and **Figure 2**).

Closure of the Secondary Ash Pond was in progress in 2022, Removal of all CCR from the inactive pond was completed in 2022. Groundwater dewatering wells were installed around the Secondary Ash Pond to temporarily lower the water table and facilitate CCR removal. The temporary wells are no longer in use.

Other CCR units at the COL facility include the COL Primary Ash Pond, Dry Ash Disposal Facility Modules 1-3, and Dry Ash Disposal Facility Modules 4-6 and 10-11. Annual groundwater monitoring and corrective action reports for these CCR units are submitted separately on January 31 of each year in accordance with 40 CFR 257.90(e).

2.0 BACKGROUND

To provide context for the annual report, the following background information is provided in this section of the report, prior to the annual report requirement sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

For the purposes of groundwater monitoring, the surficial sand and gravel aquifer is considered to be the uppermost aquifer unit, as defined under 40 CFR 257.53, at the COL Secondary Ash Pond. Immediately underlying the surficial sand and gravel aquifer is the Cambrian-Ordovician sandstone aquifer. A summary of the regional hydrogeologic stratigraphy is presented in **Appendix A**.

The sand and gravel aquifer is capable of producing sufficient water for industrial or municipal use in some parts of Columbia County and is capable of producing sufficient water for domestic use in

many areas, including along the Wisconsin River near COL (Harr et. al, 1978). A map showing expected well yields within the sand and gravel aquifer in Columbia County is included in **Appendix A**.

Regional groundwater flow in the site vicinity is generally west toward the Wisconsin River. A map showing the regional water table elevations is included with the regional hydrogeologic information in **Appendix A**.

2.1.2 Site Information

Soils at the site are primarily sand to a depth of approximately 50 to 100 feet and overlie sandstone bedrock. Soils encountered during the site feasibility study for the COL Ash Disposal Facility were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301, MW-306, MW-307, and MW-308, the unconsolidated materials were identified as consisting primarily of silty sand and sand. The boring log for previously-installed monitoring well MW-84A shows silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for the Secondary Ash Pond CCR monitoring wells are provided in **Appendix C**. All CCR monitoring wells are screened within the unconsolidated sand unit. The groundwater monitoring network and sample summary are provided in **Table 1** and **Table 2**, respectively.

In the vicinity of the ash ponds, groundwater flow has historically been radially away from the ponds in all directions; however, the October 2022 water levels and apparent flow directions reflect the influence of a temporary dewatering system installed to lower groundwater levels in the area of the Secondary Pond as part of the closure project for that CCR Unit. The groundwater flow pattern on April 2022 is shown on **Figure 3**, and the groundwater flow pattern of the October 2022 sampling is shown on **Figure 4**. The groundwater elevation data for the CCR monitoring wells and state monitoring program wells are provided in **Table 3**. Horizontal gradients and flow velocities for representative flow paths are provided in **Table 4.**

2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of two upgradient (background) monitoring wells and three downgradient monitoring wells. The background wells include MW-84A and MW-301. The background wells are shared with other CCR units at COL. The downgradient wells include MW-306, MW-307, and MW-308. The CCR Rule wells are installed in the surficial sand aquifer. Well depths range from approximately 26.4 to 37 feet, measured from the top of the well casing.

3.0 §257.100(E)(5) GROUNDWATER MONITORING AND CORRECTIVE ACTION FOR INACTIVE CCR SURFACE IMPOUNDMENTS

The owner or operator of the inactive CCR surface impoundment must: (i) No later than April 17, 2020, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and (ii) No later than August 1, 2020, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

This report is submitted to fulfill the annual reporting requirement.

4.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, and discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:*

4.1 §257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A map of the location of the site is provided as Figure 1. A map showing the inactive COL Secondary Ash Pond and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as Figure 2. Other CCR units are also shown on Figure 2.

4.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed, and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2022.

4.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Two groundwater sampling events were completed for the inactive COL Secondary Ash Pond in 2022. The established semiannual sampling for the site was followed, and sampling occurred in April 2022 and October 2022. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the assessment monitoring program is included in Table 2.

Monitoring wells MW-306 and MW-307 were not sampled during the October 2022 monitoring event due to insufficient water in the well. A dewatering well system in place to assist with the pond closure at COL lowered the shallow water table surface near the Secondary Pond, where the monitoring wells are located. On December 2, 2022, a second attempt was made to collect groundwater samples from both wells, after the dewatering wells were shut off, but there was not sufficient water present to collect a sample. Another attempt to sample the wells on January 20, 2023, was successful, and the sampling results will be included in the 2023 annual report.

The sampling results for Appendix III and Appendix IV parameters in 2022 are summarized in Table 5. Field parameter results for the 2022 sampling events are provided in Table 6. The analytical laboratory reports for 2022 are provided in Appendix C. Historical results for each monitoring well are summarized in Appendix D.

The analyses for the samples collected from background wells MW-84 and MW-301 are provided in two laboratory reports: an initial report and a reanalysis report. The background well samples were reanalyzed for select metals because the original results were flagged for detections in the method blank sample and/or were not consistent with historical results. The reanalysis was completed within the method holding time, the metals were not detected in the method blank, and no other flags were applied to the results. Based on the quality control review, the reanalysis results were considered to be more accurate than the original analyses.

4.4 §257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);

There was no monitoring program transition in 2022.

Assessment monitoring for the COL Secondary Ash Pond was initiated in January 2020 in response to statistically significant increases (SSIs) in detection monitoring constituents identified at downgradient wells. SSIs were identified for boron, chloride, and sulfate at one or more wells based on the April 2019 detection monitoring event. Wisconsin Power and Light Company (WPL) collected the first round of assessment monitoring samples in December 2019 and established an assessment monitoring program on January 13, 2020, in accordance with §257.95(b).

The initial evaluation of assessment groundwater monitoring performed at COL Secondary Ash Pond included the December 2019, February 2020, and April 2020 results and was completed in July 2020. Evaluation of the October 2021 and April 2022 results was completed in 2022.

No Appendix IV parameters were detected at statistically significant levels (SSLs) above the groundwater protection standards (GPSs) in 2022. None of the individual results in 2022 exceeded the GPS values; therefore, statistical evaluation of the significance of levels above the GPS was not required. Based on the results of the assessment monitoring conducted in 2022, WPL will continue assessment monitoring in accordance with 40 CFR 257.95(f).

For comparison of the assessment monitoring results to background concentrations, upper prediction limits (UPLs) for detection and assessment monitoring parameters were calculated based on a 1-of-2 resampling approach. In January 2021, the UPLs for Appendix III and Appendix IV parameters were updated to include background monitoring well data collected through October 2020. The UPL update analysis was provided in the 2020 Annual Groundwater Monitoring and Corrective Action Report. As shown in Table 5, concentrations of several Appendix III and Appendix IV parameters continue to be detected at levels that represent SSIs above background. Based on these results, the Secondary Ash Pond will continue in the assessment monitoring program.

4.5 §257.90(E)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in *italics*, followed by applicable information relative to the 2022 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

4.5.1 §257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program is currently in assessment monitoring after transitioning from detection monitoring in January 2020.

Summary of Key Actions Completed.

- Statistical evaluation and determination of any SSLs exceeding the GPS for the October 2021 and April 2022 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2022).

Description of Any Problems Encountered. Monitoring wells MW-306 and MW-307 were dry during the October 2022 sampling event. A dewatering system was active around the Secondary Pond in late 2022 as part of the ongoing facility closure.

Discussion of Actions to Resolve the Problems. As noted in Section 4.3, a second attempt was made to collect groundwater samples from both wells in December 2022, after the dewatering wells were shut off, but there was not sufficient water present to collect a sample. Another attempt to sample the wells on January 20, 2023, was successful, and the sampling results will be included in the 2023 annual report.

Projection of Key Activities for the Upcoming Year (2023).

- Two Semiannual Groundwater Sampling and Analysis Events (April and October 2023).
- Supplemental groundwater sampling and analysis events (January and February 2023).
- Statistical evaluation and determination of any SSLs exceeding the GPS for the October 2022 and April 2023 monitoring events.
- If one or more Appendix IV constituents is detected at a SSL above the GPS, then within 30 days WPL will prepare a notification in accordance with §257.95(g) and within 90 days complete an alternative source demonstration or initiate an assessment of

corrective measures (§257.95(g)(3)). WPL will also characterize the release pursuant to §257.95(g)(1) and provide notice pursuant to §257.95(g)(2).

4.5.2 §257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. The COL Secondary Ash Pond is no longer in detection monitoring.

4.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. The COL Secondary Ash Pond is no longer in detection monitoring.

4.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has been initiated, and no alternative assessment monitoring frequency has been proposed at this time.

4.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

The 2022 assessment monitoring results, background UPLs, and GPSs established for the site are provided in Table 5. The laboratory reports are provided in Appendix C. Historical monitoring results are summarized in Appendix D.

4.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. No alternative source demonstration for assessment monitoring was completed in 2022.

4.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

4.6 §257.90(E)(6) OVERVIEW

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

The specific requirements for the overview under §257.90(e)(6) are listed and the information is provided at the beginning of this report, before the Table of Contents.

5.0 REFERENCES

Harr, C.A., L.C. Trotta, and R.G. Borman, 1978, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.

Warzyn Engineering, Inc., 1978, Feasibility Study, Proposed Fly Ash and/or Scrubber Sludge Disposal Facility – Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

Tables

Table 1. Groundwater Monitoring Well Network
Columbia Energy Center Secondary Ash Pond / SCS Engineers Project #25222067.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
MW-306	Downgradient	Compliance
MW-307	Downgradient	Compliance
MW-308	Downgradient	Compliance

Created by:	NDK	Date:	9/19/2022
Last revision by:	NDK	Date:	9/19/2022
Checked by:	RM	Date:	12/29/2022

Table 2. CCR Rule Groundwater Samples Summary
Columbia Energy Center Secondary Pond / SCS Engineers Project #25222067.00

Sample Dates	Compliance Wells			Background Wells	
	MW-306	MW-307	MW-308	MW-84A	MW-301
4/11-13/2022	A	A	A	A	A
10/25-27/2022	--	--	A	A	A
Total Samples	1	1	2	2	2

Abbreviations:
A = Assessment Monitoring Program
-- = Not sampled

Note: Monitoring wells MW-306 and MW-307 did not have sufficient water for sample collection during the October 2022 monitoring event.

Created by:	NDK	Date:	9/19/2022
Last revision by:	RM	Date:	1/4/2023
Checked by:	BR	Date:	1/5/2023

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25222067.00

	Well Number	MW-1AR	MW-4	MW-5R	MW-33AR	MW-33BR	MW-34A	MW-34B	MW-37A	MW-83	MW-84A	MW-84B	MW-86	MW-91AR	MW-91B	MW-92A	MW-92B	MW-93A	MW-93B	MW-312
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41	827.89	827.71	826.79
	Screen Length (ft)																	10	5	10
	Total Depth (ft from top of casing)	44.40	39.58	25.97	31.08	57.50	35.43	56.95	31.80	25.42	40.21	52.02	45.43	32.90	52.38	28.94	51.75	50.7	82.5	52.5
	Top of Well Screen Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66	787.19	750.21	784.29
	Measurement Date																			
	October 2, 2012	783.41	783.70	784.96	782.38	782.23	783.03	782.99	782.66	dry	783.84	783.94	783.81	784.09	783.90	784.49	784.06	NI	NI	NI
	April 15, 2013	785.44	784.02	786.09	784.16	784.14	784.74	784.79	783.87	784.49	785.83	785.76	785.22	785.14	785.01	785.75	785.34	NI	NI	NI
	October 8, 2013													785.66	785.42	785.97	785.52	NI	NI	NI
	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52	NI	NI	NI
	April 14, 2014	784.95	784.09	785.63	783.74	783.91	784.63	784.70	783.45	783.73	785.58	785.52	784.96	785.04	784.96	785.99	785.54	NI	NI	NI
	October 2-3, 2014	785.03	785.39	786.08	784.37	784.28	784.57	784.54	784.56	dry	785.24	785.18	785.19	785.47	785.28	785.75	785.33	NI	NI	NI
	April 13-14, 2015	783.96	783.63	785.25	783.01	782.74	783.65	783.95	782.87	dry	784.43	784.51	784.17	784.48	784.37	785.07	784.66	NI	NI	NI
	October 6-7, 2015	784.28	784.44	785.72	783.68	783.33	784.05	784.02	783.66	dry	784.80	784.76	784.66	784.89	784.70	785.20	784.76	NI	NI	NI
	April 4-6, 2016	785.82	aband	787.02	785.29	785.07	785.63	785.67	784.76	785.43	786.37	786.26	785.89	786.05	785.95	786.61	786.21	NI	NI	NI
	October 11-13, 2016	786.64	aband	788.00	787.36	786.46	786.45	786.32	786.40	786.81	787.22	787.11	786.96	787.17	786.81	787.68	787.25	NI	NI	NI
	April 10-13, 2017	786.96	aband	788.13	786.39	785.99	786.30	786.28	786.34	786.23	787.16	787.06	786.96	787.24	787.03	787.90	787.60	NI	NI	NI
	October 3-5, 2017	785.48	aband	786.66	784.51	784.22	784.67	784.63	784.86	784.29	NM	786.49	785.58	786.08	785.83	786.47	786.02	NI	NI	NI
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 [6]	NM	NM	NM	NM	NM	NM	NI	NI	NI
	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM	NI	NI	NI
	April 23-25, 2018	783.99	aband	785.36	783.09	786.36	781.77	780.79	783.28	783.32	785.88	784.91	782.54	784.71	784.53	785.23	784.81	NI	NI	NI
	October 23-25, 2018	788.25	aband	789.71	788.77	787.96	787.88	787.73	787.62	788.26	788.32	788.19	788.21	788.59	788.31	789.32	788.87	NI	NI	NI
	April 1-4, 2019	787.05	aband	788.64	786.63	786.54	786.82	786.92	786.47	786.78	787.35	787.34	787.16	787.45	787.18	788.04	787.63	NI	NI	NI
	October 7-9, 2019	787.26	aband	789.23	788.26	787.64	787.92	787.74	786.77	788.90	787.79	787.73	787.44	787.78	787.62	788.63	788.17	NI	NI	NI
	May 27-28, 2020	786.92	aband	788.34	786.01	785.75	785.98	785.99	786.22	786.03	787.02	786.99	786.94	787.26	787.05	787.86	787.47	NI	NI	NI
	October 7-8, 2020	785.95	aband	787.76	785.91	785.45	785.70	785.68	785.52	785.72	786.10	786.06	786.10	786.55	786.33	786.85	786.38	NI	NI	NI
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 14, 2021	785.11	aband	787.29	784.27	784.05	784.77	784.77	784.46	c	785.84	785.81	785.60	785.86	785.69	786.47	786.06	NI	NI	NI
	June 11, 2021	NM	aband	NM	784.19	NM	784.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	October 11-12, 14, 2021	784.47	adand	786.78	783.73	783.60	784.42	784.41	783.88	783.87	784.96	784.88	784.79	785.14	784.94	785.55	785.11	NI	NI	NI
	October 17, 2021	NM	adand	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 1, 2022	aband	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 11-13, 2022	aband	adand	785.52	783.27	783.45	784.30	784.42	783.26	783.78	785.02	785.00	784.70	784.83	784.72	785.45	785.02	783.99	783.97	783.73
	October 24-28, 2022	aband	aband	785.43	781.94	781.61	783.61	783.61	782.28	dry	784.57	784.54	784.38	784.64	784.47	785.05	784.62	783.74	782.76	783.50
	Bottom of Well Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66	777.19	745.21	774.29

Dry Ash Facility (Facility ID #03025)

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25222067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR	SG-1	SG-2	SG-3	SG-4
Ash Pond Facility (Facility ID #02325)	**Top of Casing Elevation (feet amsl)**	788.23	806.10	809.62	809.50	828.86	828.84	786.29	815.48	814.21	791.55	792.90	792.06	795.25	808.60	805.36
	Screen Length (ft)															
	Total Depth (ft from top of casing)	16.90	25.55	34.80	76.07	51.88	75.80	14.40	38.50	37.85	37.37	18.96	--	--	--	--
	Top of Well Screen Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	--	--	--	--
	Measurement Date															
	October 2, 2012	780.13	786.76	781.49	781.34	782.03	781.93	780.58	779.88	781.91	780.95	780.55	789.14	793.85	dry	dry
	April 15, 2013	785.16	788.39	783.97	784.00	783.77	783.78	784.69	783.66	784.09	784.75	785.02	789.5[1]	NM	dry	dry
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36	789.5[1]	791.33	dry	dry
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	NM	NM	NM	NM	NM	NM	NM
	April 14, 2014	786.04	788.96	783.57	783.68	783.56	783.57	785.51	783.41	783.73	785.25	785.87	788.90	dry	dry	dry
	October 1-3, 2014	781.16	787.55	783.42	783.32	784.05	783.94	782.32	783.55	783.79	782.63	783.03	NM	dry	dry	dry
	April 13-14, 2015	783.08	786.83	782.77	782.68	782.80	782.82	782.81	782.83	782.93	783.34	783.42	789.3	791.70	dry	dry
	October 6-7, 2015	780.66	786.12	782.97	782.81	783.10	783.01	781.82	783.25	783.18	781.95	782.26	788.48	791.58	dry	dry
	April 4-6, 2016	784.21	789.09	785.27	785.27	784.79	784.76	783.21	784.97	785.68	785.02	784.36	NM	793.40	dry	dry
	October 11-13, 2016	781.88	787.88	785.75	785.52	785.73	785.61	783.12	786.51	786.16	783.75	784.09	788.32	792.52	dry	dry
	April 10-13, 2017	782.94	787.95	785.44	785.20	785.82	785.69	782.77	786.09	785.95	784.29	784.09	788.31	793.85	dry	dry
	October 3-5, 2017	780.93	787.04	783.35	783.18	784.30	784.19	782.37	784.23	783.89	782.48	782.61	788.3	793.45	dry	dry
	April 23-25, 2018	782.89	790.43	782.86	782.87	783.14	783.09	783.04	783.02	783.23	783.26	783.45	788.38	>795.25	dry	dry
	October 23-25, 2018	782.95	788.47	787.12	786.88	787.12	786.99	783.48	787.73	787.49	784.90	784.52	787.76	793.25	dry	dry
	April 1-4, 2019	785.68	789.44	786.28	786.31	786.56	786.45	785.27	787.39	786.53	786.33	785.46	788.40	794.60	dry	dry
	October 7-9, 2019	785.33	790.65	787.10	787.02	786.68	786.65	785.29	786.68	787.07	786.01	785.42	748.48	795.20	dry	dry
	May 27-29, 2020	781.80	787.73	785.12	784.92	785.74	785.59	783.11	785.89	785.60	783.41	783.89	748.48	>795.25	dry	dry
	October 7-8 &17, 2020	781.42	787.74	784.74	784.64	785.03	784.96	782.83	785.43	785.10	783.06	783.49	788.34	793.32	dry	NM
	April 12, 2021	782.30	786.34	783.66	783.65	784.13	784.08	782.79	784.08	783.97	783.15	783.49	788.03	793.45	below gauge	dry
	October 11-12, 14, 2021	781.03	786.33	782.94	782.85	783.09	783.03	781.94	783.11	783.04	782.15	782.66	788.59	795.13	dry	dry
	April 11-13, 2022	783.95	788.26	783.37	783.34	783.10	783.10	NM	782.99	783.40	783.93	783.83	788.4	794.65	dry	dry
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	NM	NM	NM	NM	NM	NM	NM	NM
	October 25, 26, 28, 2022	780.41	783.85	780.76	780.66	779.57	779.55	779.23	778.98	778.61	780.33	781.49	NM	795.21	dry	dry
	Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	--	--	--	--

	Well Number	MW-301	MW-302	MW-303	MW-304	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311
CCR Rule Wells	**Top of Casing Elevation (feet amsl)**	806.89	813.00	815.72	805.42	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Total Depth (ft from top of casing)	29.40	33.6	35.80	25.7	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55
	Measurement Date															
	December 21-22, 2015	785.56	784.78	784.11	786.13	788.96	787.58	783.77	783.50	785.31	NI	NI	NI	NI	NI	NI
	May 27-29, 2020	787.77	787.29	785.56	789.30	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85
	June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM
	August 6, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM
	October 7-8, 2020	786.53	786.74	785.16	788.52	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83
	December 11, 2020	NM	NM	NM	NM	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM
	February 25, 2021	NM	NM	784.27	NM	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM
	April 12, 2021	786.50	785.77	784.07	787.99	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15
	June 11, 2021	NM	NM	NM	NM	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM
	July 20, 2021	NM	NM	783.64	NM	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48
	December 21, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM
	February 24, 2022	NM	NM	782.34	NM	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 11-13, 2022	785.44	784.42	783.40	788.20	787.87	788.26	783.27	784.30	785.02	783.11	783.32	784.19	783.14	783.19	783.04
	July 27, 2022	NM	NM	783.07	NM	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 25-27, 2022	784.91	784.62	778.94	781.79	784.97	783.85	781.94	783.61	784.57	778.32	777.89	784.16	781.50	780.96	781.23
	November 30, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15
	December 2, 2022	785.12	784.48	NM	783.97	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	780.72	766.52	777.21	770.52	774.07	780.63	780.39	778.90	775.60	775.21	773.55

Notes:
NM = not measured

Created by: MDB Date: 5/6/2013
Last revision by: JR Date: 12/13/2022
Checked by: RM Date: 12/23/2022

(1) The elevation for SG-1 is read off of the staff gauge (rather than measured from the top of the gauge).
(2) SG-2 could not be located during the April 2013 event.
(3) SG-3 could not be located during the October 2013 event. SG-1 could not be safely accessed during the October 2013 event.
(4) LH-2 measurements are given as leachate depth, measured by a transducer.
(5) LH-2 and LH-3 measurements were collected by WPL staff on October 9, 2017.
(6) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5 sampling event. The level was allowed to return to static and was measured on 10/10/2017.
(7) BC = Brian Clepper; NS= Nate Sievers - Columbia Site employees.
(8) MW-303 was extended in 2022 due to regrading. Prior to October 2022, the TOC elevation was 811.52'. For events in October 2022 and later, the TOC elevation is 815.72'.

Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Secondary Pond /
SCS Engineers Project #25222067.00
January - December 2022

	East				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/11-13/2022	786.00	783.32	65	0.041	0.51

	Southwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/11-13/2022	786.00	784.00	190	0.011	0.13

	Southeast*				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
10/25-27/2022	781.00	777.89	395	0.008	0.10

	Northwest*				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
10/25-27/2022	780.96	778.32	680	0.004	0.05

Wells	**K Values (cm/sec)**	**K Values (ft/d)**
MW-306	4.36E-03	12.4
MW-307	1.74E-03	4.9
MW-308	7.03E-04	2.0
Geometric Mean	1.75E-03	5.0

Assumed Porosity, n
0.40

Groundwater flow velocity equation: $V = [K*(\Delta h/\Delta l)] / n$

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity
h1, h2 = point interpreted groundwater elevation at locations 1 and 2
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

*: Groundwater flow in October 2022 was affected by dewatering around the Secondary Pond. Flow across the pond area was to the southeast, and groundwater flowed toward the pond area from the southeast (northwestern flow direction)

Created by:	NDK	Date:	8/3/2022
Last revision by:	MDB	Date:	1/10/2023
Checked by:	RM	Date:	1/10/2023

Table 5. 2022 Groundwater Analytical Results
Columbia Energy Center - Secondary Pond / SCS Engineers Project #25222067.00

Parameter Name	UPL Method	UPL		Background Wells		Compliance Wells		
				MW-84A	MW-301	MW-306	MW-307	MW-308
				4/13/2022	4/13/2022	4/12/2022	4/12/2022	4/11/2022
Appendix III								
Boron, µg/L	P	35		10.5	28.7	114	318	503
Calcium, µg/L	NP	129,000		75,100	97,300	77,600	103,000	136,000
Chloride, mg/L	P	6.02		5.20	1.90 J	0.82 J	10.2	0.90 J
Fluoride, mg/L	DQ	DQ		<0.095	<0.095	<0.095	<0.48	<0.095
Field pH, Std. Units	P	7.76		7.34	6.60	7.06	6.85	6.93
Sulfate, mg/L	P	30.8		1.4 J, M0	12.7	9.40	141	7.30
Total Dissolved Solids, mg/L	NP	514		334	422	318	528	502
Appendix IV		**UPL**	**GPS**					
Antimony, µg/L	NP*	0.4	6	<0.15	0.31 J	<0.15	<0.15	<0.15
Arsenic, µg/L	P*	0.507	10	0.31 J	0.47 J	<0.28	2.70	3.3
Barium, µg/L	P	16.9	2000	13.5	7.8	10.4	19.0	63.6
Beryllium, µg/L	NP*	0.37	4	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium, µg/L	NP*	0.32	5	<0.15	0.3 J	<0.15	<0.15	<0.15
Chromium, µg/L	P*	2.36	100	2.2 J	<1.0	3.40	<1.0	<1.0
Cobalt, µg/L	NP*	0.38	6	<0.12	0.32 J	<0.12	1.00	0.22 J
Fluoride, mg/L	DQ	DQ	4	<0.095	<0.095	<0.095	<0.48	<0.095
Lead, µg/L	NP*	0.90	15	<0.24	3.1	<0.24	<0.24	<0.24
Lithium, µg/L	P*	0.827	40	0.36 J	0.56 J	7.80	<0.22	<0.22
Mercury, µg/L	DQ	DQ	2	<0.066	<0.066	<0.066	<0.066	<0.66
Molybdenum, µg/L	NP*	0.44	100	<0.44	<0.044	8.70	0.61 J	0.92 J
Selenium, µg/L	NP*	0.71	50	<0.32	<0.32	0.70 J	<0.32	<0.32
Thallium, µg/L	NP*	0.48	2	<0.14	0.32 J	<0.14	<0.14	<0.14
Radium 226/228 Combined, pCi/L	P	1.76	5	0.611	0.179	0.450	0.350	0.407

Blue shaded cell indicates the compliance well result exceeds the UPL and the LOQ.

Yellow shaded cell indicates the compliance well result exceed the GPS.

Abbreviations:
mg/L = milligrams per liter
µg/L = micrograms per liter
LOD = Limit of Detection
LOQ = Limit of Quantitation
GPS = Groundwater Protection Standard
UPL = Upper Prediction Limit
P = Parametric UPL with 1-of-2 retesting
-- = Not Analyzed
SSI = Statistically Significant Increase
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value) with 1-of-2- retesting

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate was outside laboratory control limits.
* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential Statistically Significant Increases above background.

Notes:
1. An individual result above the UPL or GPS does not constitute an SSI above background or statistically significant level above the GPS. See the accompanying letter text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (U.S. EPA) Maximum Contamination Level (MCLs), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs calculated based on results from background wells MW-84A and MW-301.

Created by: NDK Date: 9/19/2022
Last revision by: RM Date: 12/30/2022
Checked by: BR Date: 1/3/2023
Proj Mgr QA/QC: TK Date: 7/6/2023

Table 6. 2022 Groundwater Field Data
Columbia Energy Center - Secondary Ash Pond / SCS Engineers Project #25222067.00

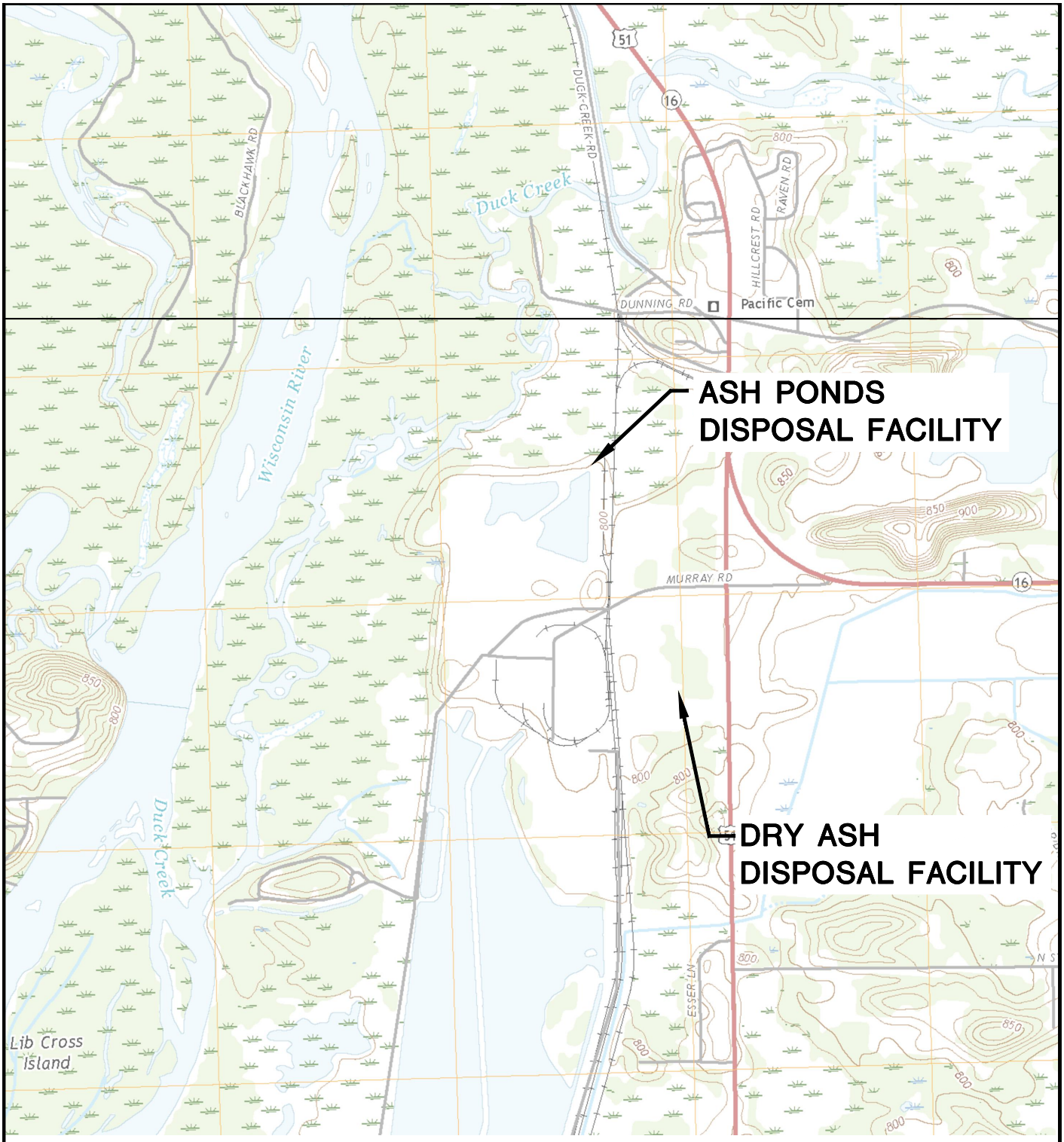
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-84A	4/13/2022	785.02	9.9	7.34	9.33	600.2	200.6	0.00
	10/27/2022	784.57	11.7	7.31	8.31	585.2	39.9	0.00
MW-301	4/13/2022	785.44	7.1	6.60	2.47	747	207.5	0.00
	10/27/2022	784.91	10.8	6.80	0.10	507.5	80.9	0.00
MW-306	4/12/2022	783.11	8.6	7.06	8.62	548.1	201.9	0.42
	10/26/2022	778.32	--	--	--	--	--	--
MW-307	4/12/2022	783.32	9.7	6.85	2.59	832	-80.5	1.86
	10/26/2022	777.89	--	--	--	--	--	--
MW-308	4/11/2022	784.19	10.5	6.93	0.25	942	202.4	2.15
	10/25/2022	784.16	13.5	7.15	0.05	900	-28.3	1.92

NM = Not Measured

Note: Monitoring wells MW-306 and MW-307 did not have sufficient water for sample collection during the October 2022 monitoring event.

Created by: DK Date: 9/2/2022
Last revision by: AJR Date: 12/5/2022
Checked by: BLR Date: 12/29/2022

Figures



N

POYNETTE QUADRANGLE
WISCONSIN–COLUMBIA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT: ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	SITE: ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI	SITE LOCATION MAP	
PROJECT NO. 25219067.00	DRAWN BY: BSS	ENGINEER: SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE 1
DRAWN: 12/02/2019	CHECKED BY: MDB		
REVISED: 01/10/2020	APPROVED BY: TK 01/30/2020		

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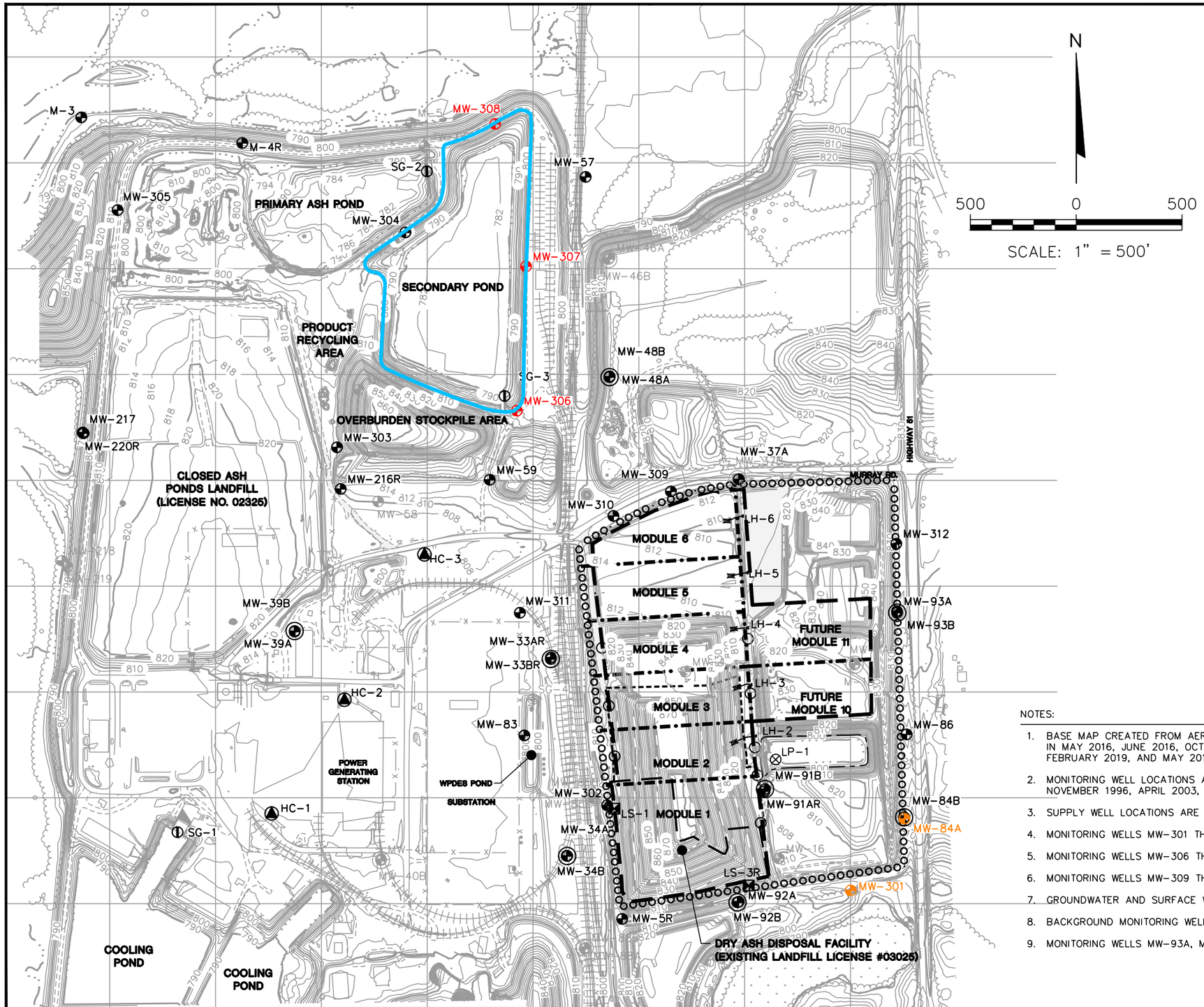

LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- ABANDONED STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 12-14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE MODULE 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.

PROJECT NO.	25222067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	RM
REVISED:	07/10/2023	APPROVED BY:	TK 7/10/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
SECONDARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25222067.00\Drawings\2023 Annual Report\Site Plan.dwg, 7/10/2023 11:34:51 AM
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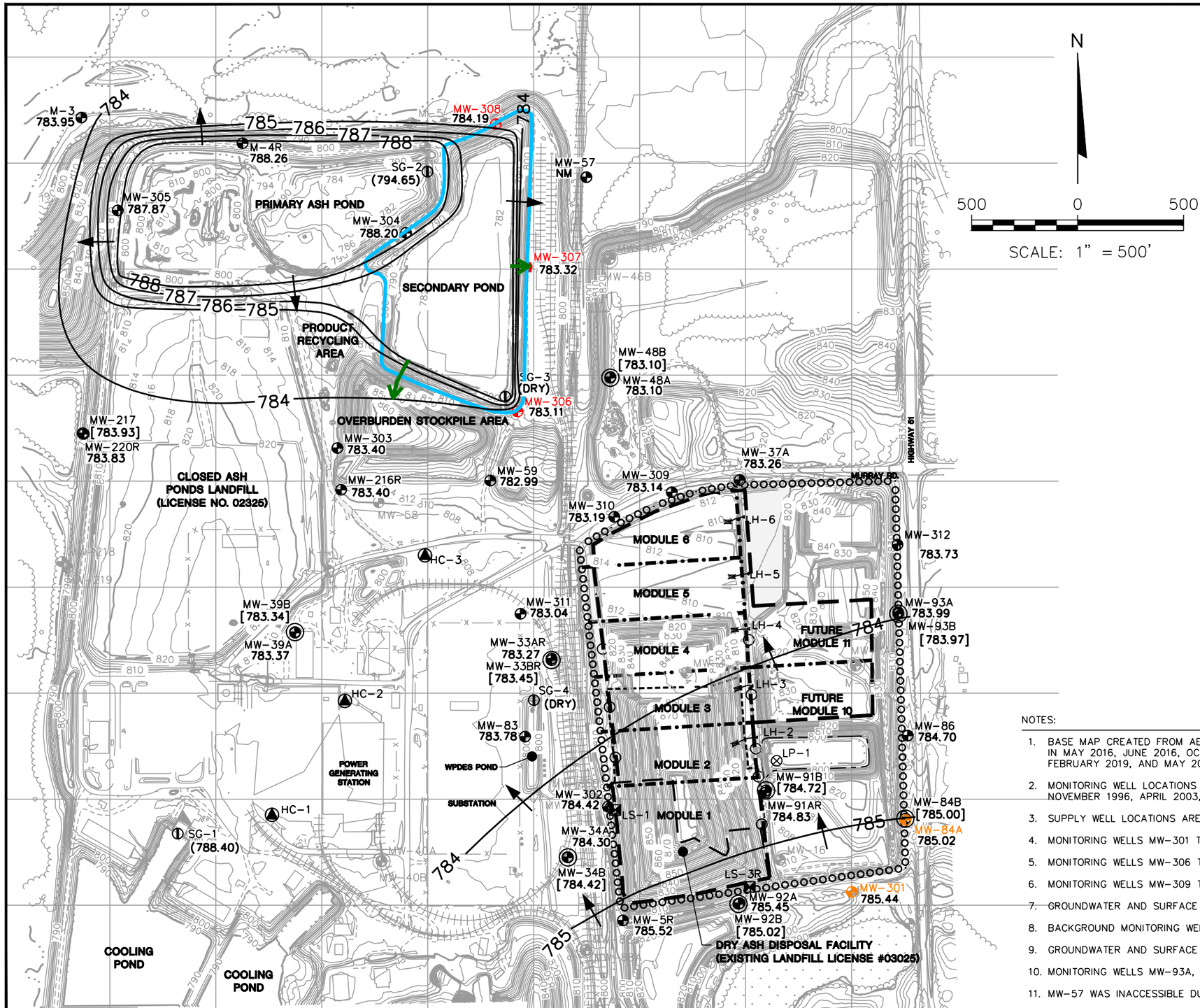


LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 — WATER TABLE ELEVATION
- [788.87] — POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (795.20) — SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11–13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14–15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13–14, 2018.
7. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 12–14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE MODULE 1–3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
9. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 11–13, 2022.
10. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25–28, 2022.
11. MW-57 WAS INACCESSIBLE DURING THE APRIL 2022 EVENT DUE TO HIGH WATER.

PROJECT NO.	25222067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	07/10/0223	APPROVED BY:	TK 7/10/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

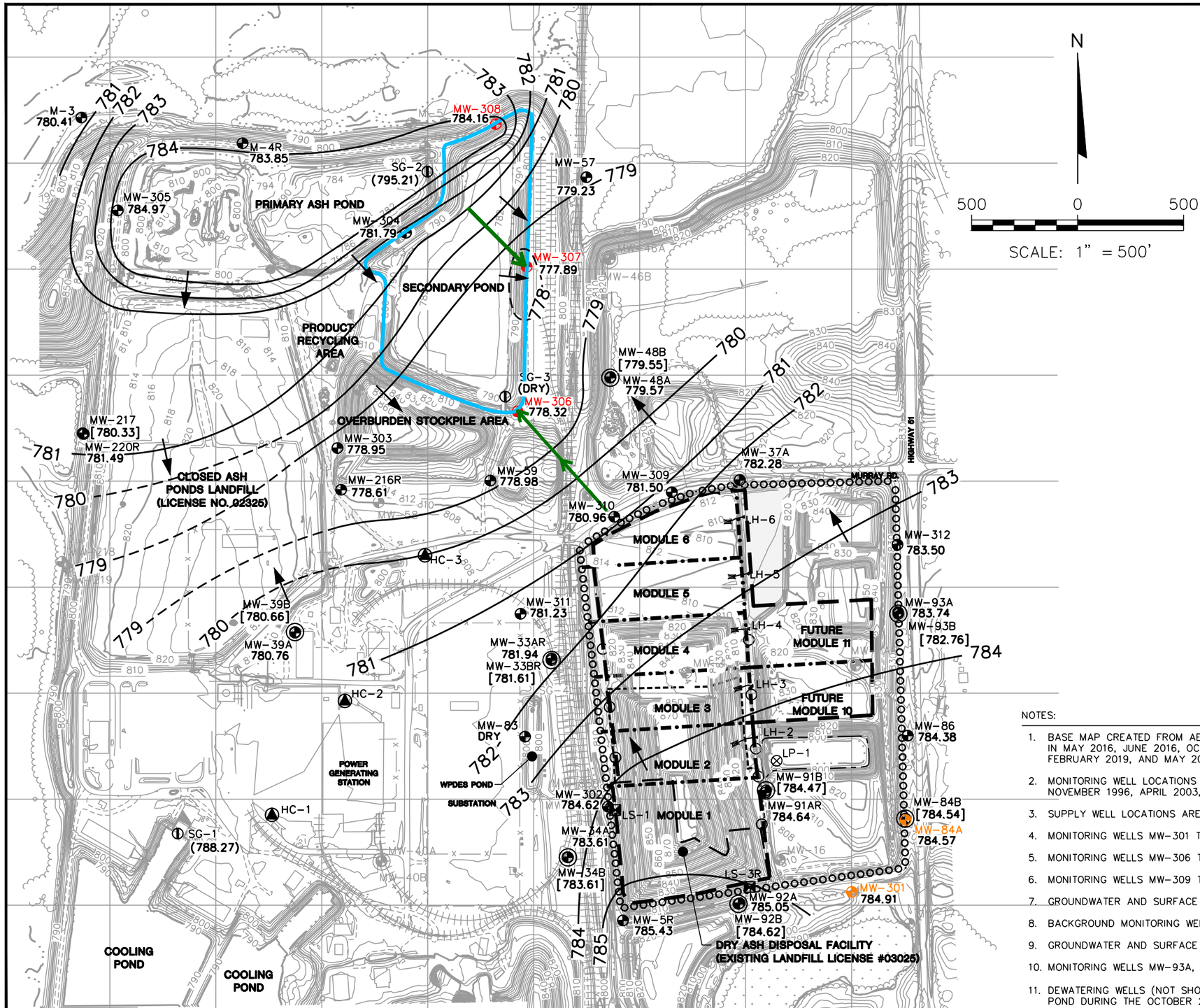
CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
SECONDARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
APRIL 2022

FIGURE 3

\\Mad-fs01\data\Projects\25222067.00\Drawings\2023 Annual Report\Water Table Map-April 2022.dwg, 7/10/2023 11:33:56 AM
\\Mad-fs01\data\Projects\25222067.00\Drawings\2023 Annual Report\Water Table Map-April 2022.dwg, 7/10/2023 11:33:54 AM



LEGEND

- EXISTING MAJOR CONTOUR (10' INTERVAL)
- EXISTING MINOR CONTOUR (2' CONTOUR)
- EXISTING FENCELINE
- EXISTING TRACKS
- EXISTING PAVED ROAD
- EXISTING UNPAVED ROAD
- EDGE OF WATER
- DRY ASH DISPOSAL FACILITY LIMITS
- LIMITS OF WASTE
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- ABANDONED STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- SURFACE WATER SAMPLE LOCATION
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- LEACHATE HEADWELL
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 WATER TABLE ELEVATION
- [788.87] POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (795.20) SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND JANUARY 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
4. MONITORING WELLS MW-301 THROUGH MW-305 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 11-13, 2015.
5. MONITORING WELLS MW-306 THROUGH MW-308 INSTALLED BY BADGER STATE DRILLING ON NOVEMBER 14-15, 2016.
6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 12-14, 2021.
8. BACKGROUND MONITORING WELLS FOR THE MODULE 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
9. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 25-27, 2022.
10. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
11. DEWATERING WELLS (NOT SHOWN) AROUND THE SECONDARY POND WERE PUMPING AND DISCHARGING TO THE PRIMARY POND DURING THE OCTOBER 2022 SAMPLING EVENT.

PROJECT NO.	25222067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	RM
REVISED:	07/10/2023	APPROVED BY:	TK 7/10/2023

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
SECONDARY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2022

FIGURE
4

\\Mad-fs01\data\Projects\25222067.00\Drawings\2023 Annual Report\Water Table Map-October 2022.dwg, 7/10/2023 11:34:25 AM
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Appendix A

Summary of Regional Hydrogeologic Stratigraphy

Table COL-3. Regional Hydrogeologic Stratigraphy
Columbia Energy Center / SCS Engineers Project #25215053

Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	• Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	• Dolomite and shaley dolomite • Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	• Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	• Igneous and metamorphic rocks

*This nomenclature and classification of rock units in this report are those of the Wisconsin Geological and Natural History Survey and do not necessarily coincide with those accepted by the U.S. Geological Survey.

Sources:

Harr, C.A., L.C. Trotta, and R.G. Borman, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.

Wisconsin Geological and Natural History Survey, Bedrock Stratigraphic Units in Wisconsin, UW Extension Educational Series 51, ISSN: 1052-2115, 2011.

I:\25215053\Reports\Report 3 - Columbia\Tables\Table_2_Regional_Hydrogeologic_Stratigraphy.doc

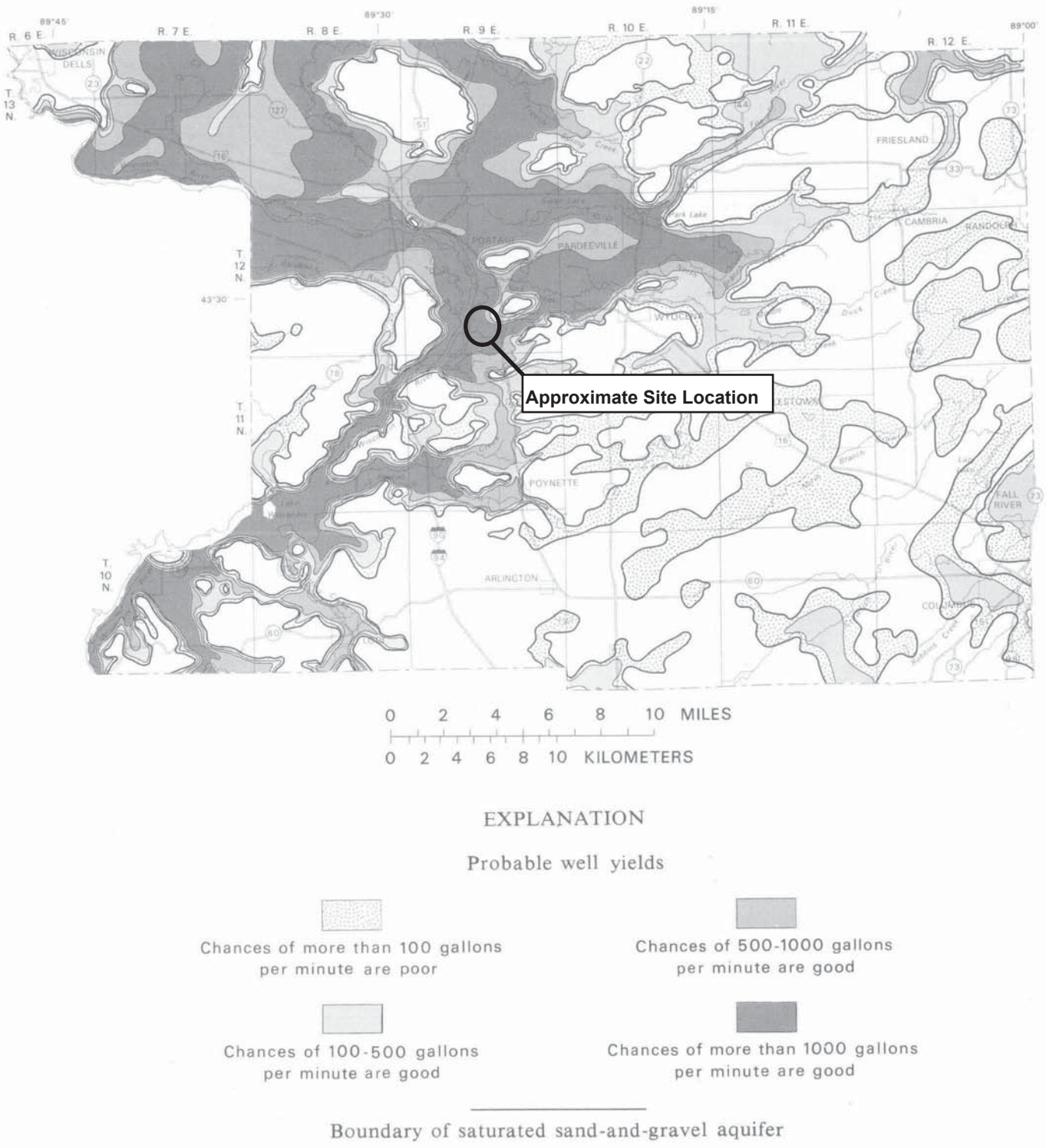
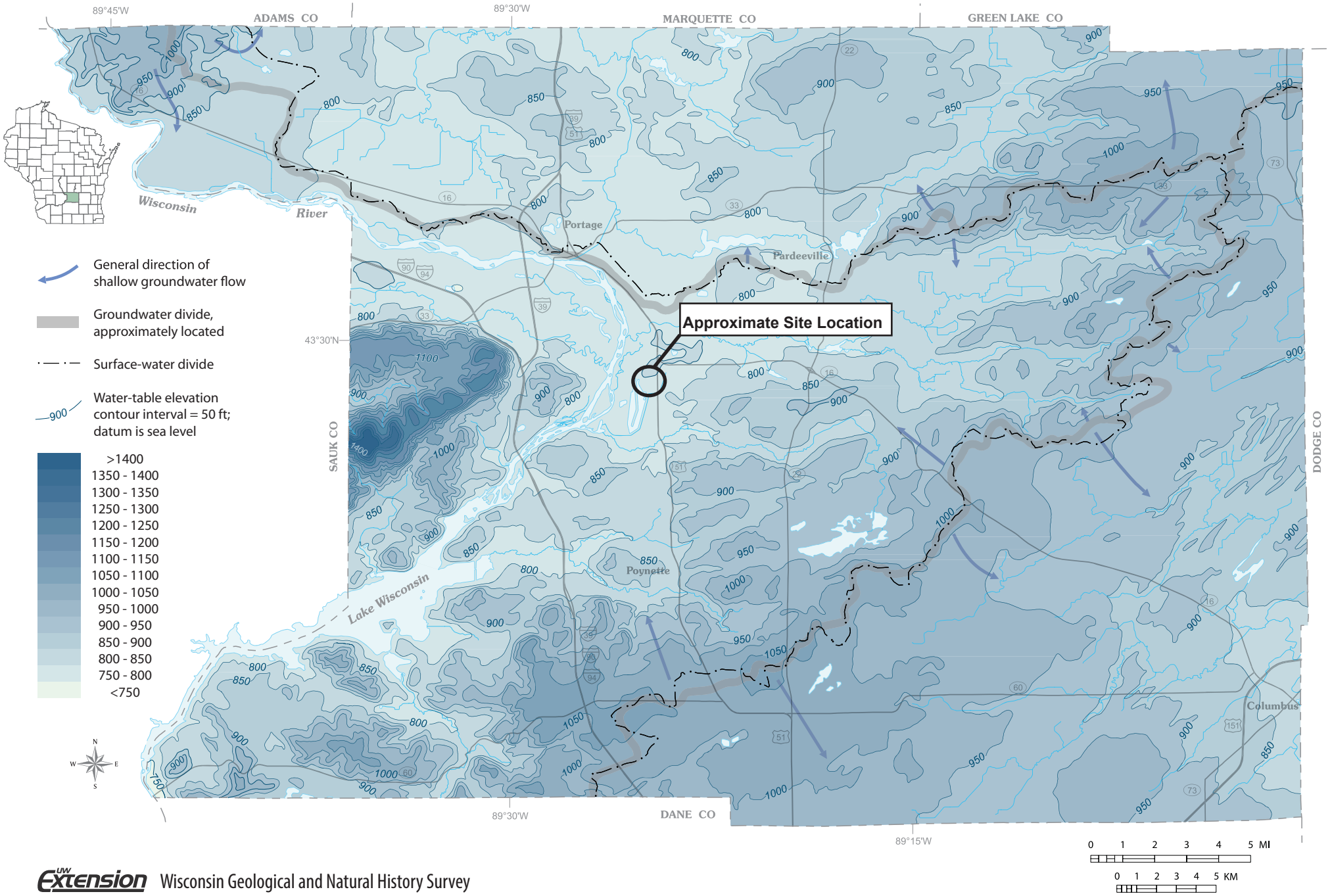


Figure 9. Probably well yields from the sand-and-gravel aquifer.

Source: Harr, C.A., L.C. Trotta, and R.G. Borman, "Ground-Water Resources and Geology of Columbia County, Wisconsin," University of Wisconisn-Extension Geological and Natural History Surevy Information Circular Number 37, 1978.

Generalized water-table elevation in Columbia County, Wisconsin



Wisconsin Geological and Natural History Survey

08/15/2023 Classification: Internal FOIA 23120619

Source: Selkwood, Stephen R., Wisconsin Geologic and Natural History Survey, Water Table Elevation, Groundwater Resources of Columbia County Wisconsin,

Appendix B

Boring Logs and Well Construction Documentation

WARZYN ENGINEERING INC

LOG OF TEST BORING

Project Wisconsin Power & Light

Location Columbia Generating Station

Boring No. MW-84A
Surface Elevation 813.4
Job No. C 7134
Sheet 1 of 1

1409 EMIL STREET • P.O. BOX 9538, MADISON, WIS. 53715 • TEL. (608) 257-4848

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery		Moisture									
No.	Type	↓	↓	N	Depth		q_u	W	LL	PL	D
						Dark Brown Silty SAND (SM)					
					5						
						Brown Fine to Medium SAND, Little Silt, Trace to Little Gravel and Boulders (SM)					
					10						
					15						
					20						
					25						
					30						
					35						
					40	End Boring at 37'					
						Well Installed at 37'					

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 10/5/83 Complete 10/5/83
Crew Chief JVS Rig B-40
Drilling Method ED 0-37'

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

DATE 10/5/83

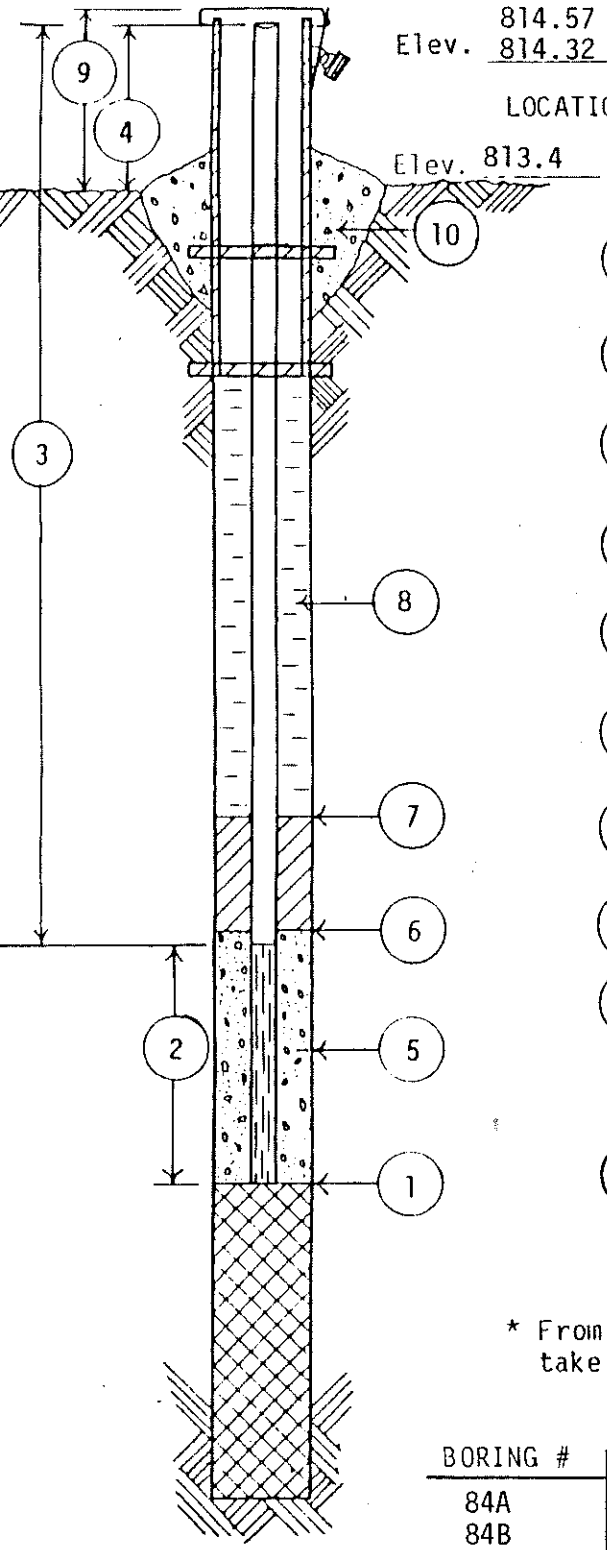
Elev. 814.57 Steel
814.32 PVC

CHIEF JS

LOCATION WP&L-Columbia Generating Station

Elev. 813.4

All depth measurements of well detail assumed to be from ground surface unless otherwise indicated.



(1) DEPTH TO BOTTOM OF BOREHOLE
37 FEET

(2) LENGTH OF WELL POINT, (WELL SCREEN,) OR SLOTTED PIPE 10 FEET

(3) TOTAL LENGTH OF SOLID PIPE 29 FEET @ 2 IN. DIAMETER

(4) HEIGHT OF WELL CASING ABOVE GROUND
2 FEET

(5) TYPE OF FILTER MATERIAL AROUND WELL POINT OR SLOTTED PIPE Flint Sand

(6) DEPTH OF LOWER OR BOTTOM SEAL
3 FEET

(7) DEPTH OF UPPER OR TOP SEAL
0 FEET

(8) TYPE OF BACKFILL Spoils (Sand)

(9) PROTECTIVE CASING (YES) NO

HEIGHT ABOVE GROUND 2'

LOCKING CAP (YES) NO

(10) CONCRETE CAP (YES) NO

WATER LEVEL CHECKS

* From top of casing, if protective casing higher take measurement from top of protective casing.

BORING #	DATE	TIME	DEPTH TO WATER	REMARKS
84A	10/7/83	3 days	21'	
84B	10/7/83	3 days	19'6"	

WARZYN ENGINEERING INC.

SCS # 25215135

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Columbia	Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W.	Well Name: MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY701 / DNR Well ID No.:
Facility ID	St. Plane 541562.2 ft. N, 2125001 ft. E. S/C/N	Date Well Installed: 11 / 11 / 2015 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SW 1/4 of SE 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / Badger State Drilling
Distance from Waste/Source ____ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation 807.16 ft. MSL

B. Well casing, top elevation 806.89 ft. MSL

C. Land surface elevation 803.69 ft. MSL

D. Surface seal, bottom 791.69 ft. MSL or 12 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☐ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ____

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top 803.69 ft. MSL or 0 ft.

F. Fine sand, top 791.69 ft. MSL or 12 ft.

G. Filter pack, top 789.69 ft. MSL or 14 ft.

H. Screen joint, top 787.69 ft. MSL or 16 ft.

I. Well bottom 777.69 ft. MSL or 26 ft.

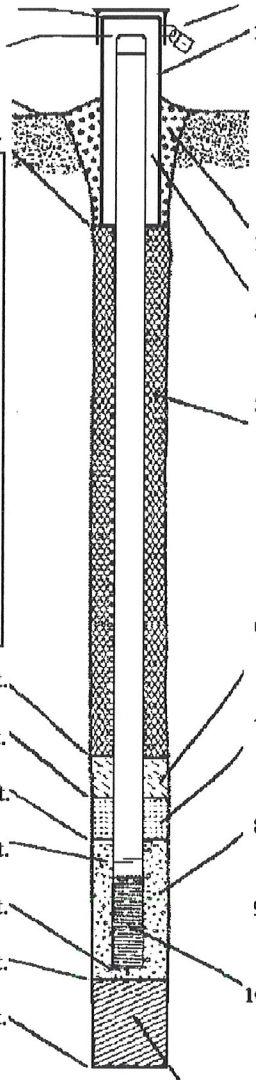
J. Filter pack, bottom 776.69 ft. MSL or 27 ft.

K. Borehole, bottom 775.69 ft. MSL or 28 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.4 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ☐ Yes ☒ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts

3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ____

4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐ ____
Bentonite to grade, sand above

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. 4 ft3 Other ☐ ____

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 2 ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ____

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ____
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): Native / None ☐ 14 / Other ☒ ____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Columbia SCS#: 25215135.00		MW-301

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State Drilling	11/11/2015	11/11/2015	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY701			Feet	803.69 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 541562.2 N, 2025001.0 E S/C/N
1/4 of 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	21	7 6 9 10	1–2	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.						M				
S2	20	6 7 9 10	3–4	Same as above except, 10YR 5/4 (top section), 10YR 3/6 (bottom section), trace gravel.						M				
S3	22	7 6 9 6	5–7	Same as above except, 10YR 3/4 (bottom), 10YR 5/4 (top), trace little roots and sticks, trace gravel.	SM					M				
S4	21	4 5 6 5	8–10	Same as above except, 10YR (top), 10YR 4/6 (bottom), trace clay at bottom.						M				
S5	18	2 2 4 5	11–12	Same as above except, fine to coarse grained sand, little gravel, trace clay in top half, 10YR 3/6.						M				
S6	20	2 3 3 3	13–15	Same as above except, 10YR 6/8.						M				

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
Tel: (608) 224-2830
Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-301 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Pocket Penetration (tsf)	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.										
S7	20	5 4 4 3	17							M				
			18											
			19											
S8	20	2 4 4 5	20							W				
			21		SM									
S9	23	4 4 3 6	22							W				
			23											
			24	Same as above except, 10YR 6/4.										
S10	21	3 2 4 10	25							W				
			26											
			27											
			28	End of boring at 28 ft bgs.										

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
Alliant-Columbia	Columbia	MW-301

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VY701	

1. Can this well be purged dry? ☐ Yes ☒ No

2. Well development method

surged with bailer and bailed	☐ 41
surged with bailer and pumped	☒ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 120 min.

4. Depth of well (from top of well casisng) 29.4 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing 7.6 gal.

7. Volume of water removed from well 84.0 gal.

8. Volume of water added (if any) ____.__ gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☒ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 21.72 ft.	21.77 ft.
Date	b. 12/02/2015 (m m d d y y y y)	12/02/2015
Time	c. 08:30 ☒ a.m. ☐ p.m.	10:30 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0.__ inches	0.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Well developed by: Name (first, last) and Firm
First Name: Gary Last Name: Sterkel
Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Wisconsin Power and Light
Street: W8375 Murray Rd.
City/State/Zip: Pardeville, WI 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: for Gary Sterkel
Print Name: Gary Sterkel
Firm: SCS ENGINEERS

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL- Columbia SCS#: 25216146.00		MW-306

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Duerst Badger State Drilling	11/14/2016	11/14/2016	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY812		MW-306	Feet	805.30 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 543,829 N, 2,123,424 E S/C/N
SE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL.										
			1	SILTY SAND, yellowish brown (10YR 5/4), medium grained.										
S1	23	8 13 11 11	4							M				
S2	16	7 5 5 5	7		SM					M				
S3	16	2 4 8 14	9							M				
S4	16	7 10 7 10	12							M				
S5	23	9 22 31 39	14	POORLY GRADED SAND, light yellowish brown (10YR 6/4), medium grained, dense.	SP					M				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
Tel: (608) 224-2830
Fax:

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-306 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16		SP									
S6	22	17 29 40 42	17							M				
				SILTY SAND, yellowish brown (10YR 5/4), fine to medium grained.										
			18											
S7	24	26 41 47 44	19							M				
			20											wl= 20 ft bgs.
			21											
S8	20	11 25 37 46	22		SM					W				
			23											
S9	24	8 19 31 44	24							W				
			25											
			26											
			27											
			28	End of boring at 28 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL- Columbia SCS#: 25216146.00		MW-307

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Duerst Badger State Drilling	11/14/2016	11/15/2016	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY813		MW-307	Feet	804.53 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 544,511 N, 2,123,467 E S/C/N
SE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	TOPSOIL.										
			1	SILTY SAND, yellowish brown (10YR 5/4), medium grained.										
S1	23	5 5 7 14	4							M				
S2	22	11 22 24 38	6	Same as above except, pale brown (10YR 6/3).						M				
			8		SM									
S3	22	7 25 33 40	9							M				rock in spoon.
S4	22	14 18 22 26	12							M				
S5	24	12 18 19 22	14							M				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel: (608) 224-2830
	SCS Engineers 2830 Dairy Drive Madison, WI 53711	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-307 Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S6	23	12 16 16 19	16 17							M				
S7	24	6 8 8 6	18 19	Same as above except, brown (10YR 4/3).						M				wl=19.5 ft bgs.
S8	20	3 4 4 4	20 21 22		SM					W				
S9	24	2 2 6 8	23 24 25	Same as above except, brown (10YR 5/3).						W				
S10	24	2 3 3 7	26 27							W				
				End of boring at 27.5 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL- Columbia SCS#: 25216146.00		MW-308

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Duerst Badger State Drilling	11/15/2016	11/15/2016	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VY814		MW-308	Feet	804.54 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 545,184 N, 2,123,321 E S/C/N
NE 1/4 of NW 1/4 of Section 27, T 12 N, R 9 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Columbia	11	Portage

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	POORLY GRADED GRAVEL.	GP									
			1	SILTY SAND, brown (10YR 5/3), medium grained.										
S1	23	5 17 23 25	4							M				
S2	23	10 21 17 19	7							M				
			8		SM									
S3	24	10 15 18 26	9							M				
S4	24	11 23 19 23	12							M				
			13	Same as above except, brown (10YR 4/3).										
S5	19	9 12 16 16	14							M				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
Tel: (608) 224-2830
Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-308 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S6	24	9 12 11 9	16–17	SITLY SAND, brown (10YR 5/3), medium grained.						M				
S7	22	9 11 10 11	18–20	Same as above except, very dark grayish brown (10YR 3/2).	SM					M				
S8	22	4 10 11 7	21–22							W				wl=21.25 ft bgs.
S9A S9B	23	4 3 4 7	23–25	Same as above except, brown (10YR 5/3). PEAT, black (10YR 2/1), dense.	PT					W				Fibrous roots
S10A S10B	24	5 6 9 15	26–27	SILT, dark gray (10YR 4/1). SILTY SAND, grayish brown (10YR 5/2).	ML SM					W				
S11	18	5 10 9 9	28–29							W				
				End of boring at 29 ft bgs.										

SCS # 25216146.00

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL- Columbia	Local Grid Location of Well: ____ ft. ☐N. ☐S. ____ ft. ☐E. ☐W.	Well Name: MW-306
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VY812 / DNR Well ID No.:
Facility ID	St. Plane 543828.99 ft. N, 2123423.65 ft. E. S/C/N	Date Well Installed: 11 / 14 / 2016 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; Badger State Drilling
Distance from Waste/Source ____ ft. / Enf. Stds. Apply ☒	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation 807.88 ft. MSL
B. Well casing, top elevation 807.66 ft. MSL
C. Land surface elevation 805.30 ft. MSL
D. Surface seal, bottom 804.8 ft. MSL or 0.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

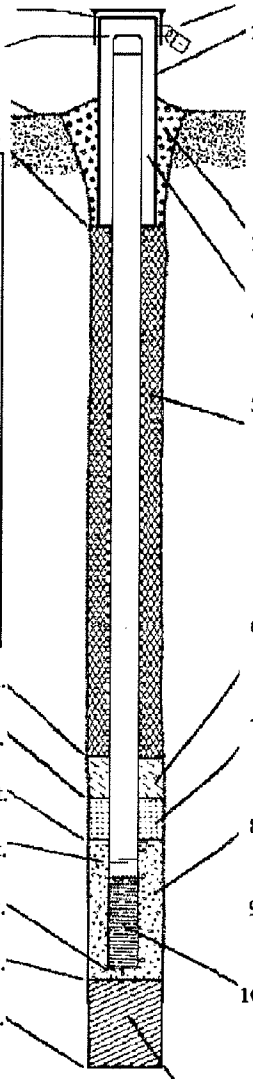
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe ____

17. Source of water (attach analysis, if required):

E. Bentonite seal, top 804.8 ft. MSL or 0.5 ft.
F. Fine sand, top 791.3 ft. MSL or 14 ft.
G. Filter pack, top 790.3 ft. MSL or 15 ft.
H. Screen joint, top 788.3 ft. MSL or 17 ft.
I. Well bottom 778.3 ft. MSL or 27 ft.
J. Filter pack, bottom 778.3 ft. MSL or 27 ft.
K. Borehole, bottom 777.3 ft. MSL or 28 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐ ___
Bentonite to grade, sand above
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. ____ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 3 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☐ 14 / Other ☒ ___
RW Sidley #5

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

SCS # 25216146.00

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL- Columbia	Local Grid Location of Well: ___ ft. ☐N. ☐S. ___ ft. ☐E. ☐W.	Well Name: MW-307
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VY813 / DNR Well ID No.:
Facility ID	St. Plane 544510.95 ft. N, 2123466.6 ft. E. S/C/N	Date Well Installed: 11 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 27, T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst / Badger State Drilling
Distance from Waste/Source ___ ft. / Enf. Stds. Apply ☒	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number:

A. Protective pipe, top elevation 807.16 ft. MSL
B. Well casing, top elevation 806.96 ft. MSL
C. Land surface elevation 804.53 ft. MSL
D. Surface seal, bottom 804.03 ft. MSL or 0.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

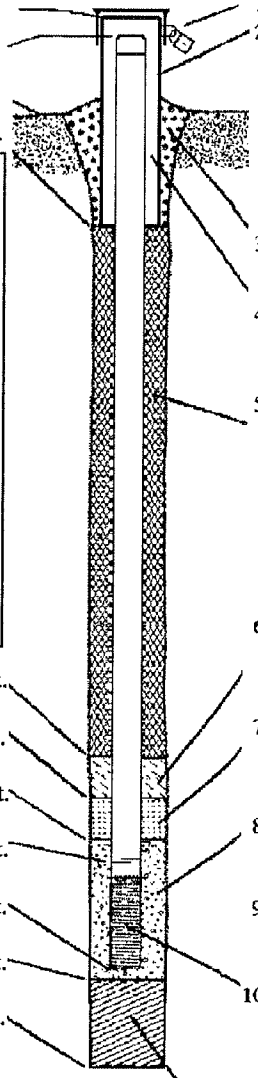
15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe ___

17. Source of water (attach analysis, if required):

E. Bentonite seal, top 804.03 ft. MSL or 0.5 ft.
F. Fine sand, top 791.03 ft. MSL or 13.5 ft.
G. Filter pack, top 790.03 ft. MSL or 14.5 ft.
H. Screen joint, top 788.03 ft. MSL or 16.5 ft.
I. Well bottom 778.03 ft. MSL or 26.5 ft.
J. Filter pack, bottom 777.03 ft. MSL or 27.5 ft.
K. Borehole, bottom 777.03 ft. MSL or 27.5 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐ ___
Bentonite to grade, sand above
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. ___ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 3.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☐ 14 / Other ☒ ___
RW Sidley #5

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

SCS # 25216146.00

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐ Remediation/Redevelopment ☐ Other ☐

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 7-98

Facility/Project Name: WPL- Columbia	Local Grid Location of Well: ___ ft. ☐N ☐S, ___ ft. ☐E ☐W	Well Name: MW-308
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VY814 / DNR Well ID No.: ___
Facility ID: ___	St. Plane 545183.88 ft. N, 2123320.76 ft. E. S/C/N	Date Well Installed: 11 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 11 / MW	Section Location of Waste/Source: NE 1/4 of NW 1/4 of Sec. 27 T. 12 N, R. 9 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Duerst; Badger State Drilling
Distance from Waste/Source ___ ft. / Enf. Stds. Apply ☒	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number: ___

A. Protective pipe, top elevation 807.10 ft. MSL
B. Well casing, top elevation 806.92 ft. MSL
C. Land surface elevation 804.54 ft. MSL
D. Surface seal, bottom 804.04 ft. MSL or 0.5 ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☒ SC ☐ ML ☒ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

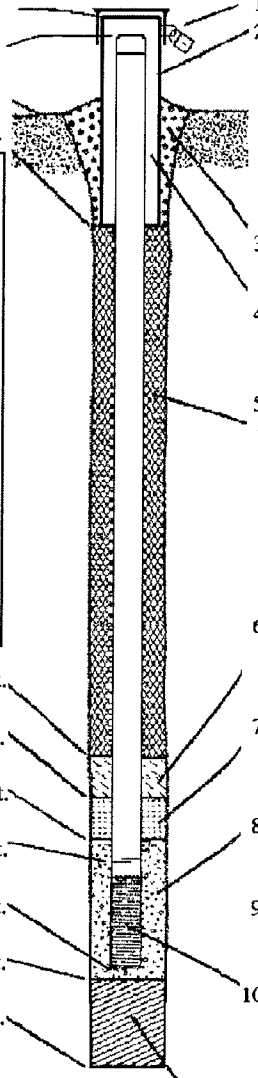
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

15. Drilling fluid used: Water ☐ 02 / Air ☐ 01 / Drilling Mud ☐ 03 / None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No
Describe ___

17. Source of water (attach analysis, if required):
___

E. Bentonite seal, top 804.04 ft. MSL or 0.5 ft.
F. Fine sand, top 789.54 ft. MSL or 15.0 ft.
G. Filter pack, top 788.54 ft. MSL or 16.0 ft.
H. Screen joint, top 786.54 ft. MSL or 18.0 ft.
I. Well bottom 776.54 ft. MSL or 28.0 ft.
J. Filter pack, bottom 775.54 ft. MSL or 29.0 ft.
K. Borehole, bottom 775.54 ft. MSL or 29.0 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☒ 30 / Other ☐ ___
Bentonite to grade, sand above
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☒ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☒ 32
c. ___ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley Inc. #7 ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 ☐
b. Volume added 3 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
b. Manufacturer Johnson
c. Slot size: 0.01 in.
d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☐ 14 / Other ☒ ___
RW Sidley #5

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: [signature] Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

Appendix C

Laboratory Reports

C1 April 2022 Compliance Well Assessment Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

June 16, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

Revised Report: Field measurements have been updated for MW-306

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Matt Bizjack, Alliant Energy
Sherren Clark, SCS Engineers
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40243486001	**MW-308**	Water	04/11/22 14:55	04/15/22 07:10
40243486002	**MW-306**	Water	04/12/22 11:20	04/15/22 07:10
40243486003	**MW-307**	Water	04/12/22 11:00	04/15/22 07:10
40243486004	**FIELD BLANK SC POND**	Water	04/12/22 11:20	04/15/22 07:10

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40243486001	**MW-308**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40243486002	**MW-306**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40243486003	**MW-307**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40243486004	**FIELD BLANK SC POND**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-308 **Lab ID: 40243486001** Collected: 04/11/22 14:55 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 03:58	7440-36-0	
Arsenic	**3.3**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 03:58	7440-38-2	
Barium	**63.6**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 03:58	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 03:58	7440-41-7	
Boron	**503**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 03:58	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 03:58	7440-43-9	
Calcium	**136000**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 03:58	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 03:58	7440-47-3	
Cobalt	**0.22J**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 03:58	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 03:58	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 03:58	7439-93-2	
Molybdenum	**0.92J**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 03:58	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 03:58	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 03:58	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 08:24	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.93**	Std. Units			1		04/11/22 14:55		
Field Specific Conductance	**942.0**	umhos/cm			1		04/11/22 14:55		
Oxygen, Dissolved	**0.25**	mg/L			1		04/11/22 14:55	7782-44-7	
REDOX	**202.4**	mV			1		04/11/22 14:55		
Turbidity	**2.15**	NTU			1		04/11/22 14:55		
Static Water Level	**784.19**	feet			1		04/11/22 14:55		
Temperature, Water (C)	**10.5**	deg C			1		04/11/22 14:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**502**	mg/L	20.0	8.7	1		04/15/22 16:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.2**	Std. Units	0.10	0.010	1		04/25/22 11:23		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.90J**	mg/L	2.0	0.43	1		05/04/22 22:21	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/06/22 16:28	16984-48-8	
Sulfate	**7.3**	mg/L	2.0	0.44	1		05/04/22 22:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-306 **Lab ID: 40243486002** Collected: 04/12/22 11:20 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 04:05	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 04:05	7440-38-2	
Barium	**10.4**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 04:05	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 04:05	7440-41-7	
Boron	**114**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 04:05	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 04:05	7440-43-9	
Calcium	**77600**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 04:05	7440-70-2	
Chromium	**3.4**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 04:05	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 04:05	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 04:05	7439-92-1	
Lithium	**7.8**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 04:05	7439-93-2	
Molybdenum	**8.7**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 04:05	7439-98-7	
Selenium	**0.70J**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 04:05	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 04:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 08:27	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.06**	Std. Units			1		04/12/22 11:20		
Field Specific Conductance	**548.1**	umhos/cm			1		04/12/22 11:20		
Oxygen, Dissolved	**8.62**	mg/L			1		04/12/22 11:20	7782-44-7	
REDOX	**201.9**	mV			1		04/12/22 11:20		
Turbidity	**0.42**	NTU			1		04/12/22 11:20		
Static Water Level	**783.11**	feet			1		04/12/22 11:20		
Temperature, Water (C)	**8.6**	deg C			1		04/12/22 11:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**318**	mg/L	20.0	8.7	1		04/15/22 16:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		04/25/22 11:25		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**0.82J**	mg/L	2.0	0.43	1		05/10/22 16:40	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/22 16:40	16984-48-8	
Sulfate	**9.4**	mg/L	2.0	0.44	1		05/10/22 16:40	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-307 **Lab ID: 40243486003** Collected: 04/12/22 11:00 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 04:13	7440-36-0	
Arsenic	**2.7**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 04:13	7440-38-2	
Barium	**19.0**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 04:13	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 04:13	7440-41-7	
Boron	**318**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 04:13	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 04:13	7440-43-9	
Calcium	**103000**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 04:13	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 04:13	7440-47-3	
Cobalt	**1.0**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 04:13	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 04:13	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 04:13	7439-93-2	
Molybdenum	**0.61J**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 04:13	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 04:13	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 04:13	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 08:29	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.85**	Std. Units			1		04/12/22 11:00		
Field Specific Conductance	**832.0**	umhos/cm			1		04/12/22 11:00		
Oxygen, Dissolved	**2.59**	mg/L			1		04/12/22 11:00	7782-44-7	
REDOX	**-80.5**	mV			1		04/12/22 11:00		
Turbidity	**1.86**	NTU			1		04/12/22 11:00		
Static Water Level	**783.32**	feet			1		04/12/22 11:00		
Temperature, Water (C)	**9.7**	deg C			1		04/12/22 11:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**528**	mg/L	20.0	8.7	1		04/15/22 16:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		04/25/22 11:28		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**10.2**	mg/L	10.0	2.2	5		05/10/22 17:25	16887-00-6	
Fluoride	**<0.48**	mg/L	1.6	0.48	5		05/10/22 17:25	16984-48-8	
Sulfate	**141**	mg/L	10.0	2.2	5		05/10/22 17:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: FIELD BLANK SC POND **Lab ID: 40243486004** Collected: 04/12/22 11:20 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 01:02	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 01:02	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 01:02	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 01:02	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 01:02	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 01:02	7440-43-9	
Calcium	**<76.2**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 01:02	7440-70-2	
Chromium	**1.1J**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 01:02	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 01:02	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 01:02	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 01:02	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 01:02	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 01:02	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 01:02	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 08:36	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**10.0J**	mg/L	20.0	8.7	1		04/15/22 16:47		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.0**	Std. Units	0.10	0.010	1		04/25/22 11:37		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		05/10/22 17:40	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/22 17:40	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		05/10/22 17:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 413634 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

METHOD BLANK: 2381580 Matrix: Water
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	04/21/22 07:47	

LABORATORY CONTROL SAMPLE: 2381581

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2381582 2381583

Parameter	Units	40243482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.0	5.0	100	101	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 413354
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

METHOD BLANK: 2380530 Matrix: Water
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/01/22 00:40	
Arsenic	ug/L	<0.28	1.0	05/01/22 00:40	
Barium	ug/L	<0.70	2.3	05/01/22 00:40	
Beryllium	ug/L	<0.25	1.0	05/01/22 00:40	
Boron	ug/L	<3.0	10.0	05/01/22 00:40	
Cadmium	ug/L	<0.15	1.0	05/01/22 00:40	
Calcium	ug/L	<76.2	254	05/01/22 00:40	
Chromium	ug/L	<1.0	3.4	05/01/22 00:40	
Cobalt	ug/L	<0.12	1.0	05/01/22 00:40	
Lead	ug/L	<0.24	1.0	05/01/22 00:40	
Lithium	ug/L	<0.22	1.0	05/01/22 00:40	
Molybdenum	ug/L	<0.44	1.5	05/01/22 00:40	
Selenium	ug/L	<0.32	1.1	05/01/22 00:40	
Thallium	ug/L	<0.14	1.0	05/01/22 00:40	

LABORATORY CONTROL SAMPLE: 2380531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	261	104	80-120	
Arsenic	ug/L	250	263	105	80-120	
Barium	ug/L	250	249	99	80-120	
Beryllium	ug/L	250	270	108	80-120	
Boron	ug/L	250	250	100	80-120	
Cadmium	ug/L	250	268	107	80-120	
Calcium	ug/L	10000	9930	99	80-120	
Chromium	ug/L	250	254	102	80-120	
Cobalt	ug/L	250	248	99	80-120	
Lead	ug/L	250	266	106	80-120	
Lithium	ug/L	250	250	100	80-120	
Molybdenum	ug/L	250	249	100	80-120	
Selenium	ug/L	250	278	111	80-120	
Thallium	ug/L	250	252	101	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380532 2380533

Parameter	Units	40243482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	250	250	256	257	102	103	75-125	0	20	
Arsenic	ug/L	0.31J	250	250	256	259	102	103	75-125	1	20	
Barium	ug/L	13.5	250	250	260	258	99	98	75-125	1	20	
Beryllium	ug/L	<0.25	250	250	260	260	104	104	75-125	0	20	
Boron	ug/L	10.5	250	250	255	248	98	95	75-125	3	20	
Cadmium	ug/L	<0.15	250	250	258	259	103	104	75-125	0	20	
Calcium	ug/L	75100	10000	10000	86700	85700	116	106	75-125	1	20	
Chromium	ug/L	2.2J	250	250	256	252	102	100	75-125	2	20	
Cobalt	ug/L	<0.12	250	250	244	241	98	96	75-125	1	20	
Lead	ug/L	<0.24	250	250	267	267	107	107	75-125	0	20	
Lithium	ug/L	0.36J	250	250	250	249	100	99	75-125	0	20	
Molybdenum	ug/L	<0.44	250	250	252	250	101	100	75-125	1	20	
Selenium	ug/L	<0.32	250	250	264	268	106	107	75-125	1	20	
Thallium	ug/L	<0.14	250	250	257	256	103	103	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 413340 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

METHOD BLANK: 2380206 Matrix: Water
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/15/22 16:44	

LABORATORY CONTROL SAMPLE: 2380207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	555	524	94	80-120	

SAMPLE DUPLICATE: 2380208

Parameter	Units	40243482001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	334	332	1	10	

SAMPLE DUPLICATE: 2380209

Parameter	Units	40243482002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	422	412	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 413997
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

SAMPLE DUPLICATE: 2383964

Parameter	Units	40243488001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.4	0	20	H6

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 414730
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486001

METHOD BLANK: 2387879 Matrix: Water
Associated Lab Samples: 40243486001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/04/22 11:51	
Fluoride	mg/L	<0.095	0.32	05/04/22 11:51	
Sulfate	mg/L	<0.44	2.0	05/04/22 11:51	

LABORATORY CONTROL SAMPLE: 2387880

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.5	102	90-110	
Fluoride	mg/L	2	2.0	100	90-110	
Sulfate	mg/L	20	20.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2387881 2387882

Parameter	Units	40243924001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	224	400	400	655	655	108	108	90-110	0	15	
Sulfate	mg/L	182	400	400	614	615	108	108	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2387883 2387884

Parameter	Units	40243485003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.79J	20	20	22.4	22.7	108	110	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.1	106	107	90-110	1	15	
Sulfate	mg/L	22.1	20	20	44.3	44.6	111	112	90-110	1	15	M0

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 415066
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243486002, 40243486003, 40243486004

METHOD BLANK: 2389806 Matrix: Water
Associated Lab Samples: 40243486002, 40243486003, 40243486004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/10/22 16:11	
Fluoride	mg/L	<0.095	0.32	05/10/22 16:11	
Sulfate	mg/L	<0.44	2.0	05/10/22 16:11	

LABORATORY CONTROL SAMPLE: 2389807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.1	106	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	21.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2389808 2389809

Parameter	Units	40243486002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	0.82J	20	20	22.6	22.6	109	109	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.1	107	107	90-110	0	15	
Sulfate	mg/L	9.4	20	20	31.9	32.0	113	113	90-110	0	15	M0

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-308 **Lab ID: 40243486001** Collected: 04/11/22 14:55 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.310 ± 0.472 (1.08) C:NA T:99%**	pCi/L	05/03/22 12:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.407 ± 0.345 (0.688) C:73% T:86%**	pCi/L	05/02/22 12:16	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.407 ± 0.817 (1.77)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-306 **Lab ID: 40243486002** Collected: 04/12/22 11:20 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0716 ± 0.421 (0.860) C:NA T:89%**	pCi/L	05/03/22 12:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.378 ± 0.295 (0.579) C:78% T:95%**	pCi/L	05/02/22 12:16	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.450 ± 0.716 (1.44)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: MW-307 **Lab ID: 40243486003** Collected: 04/12/22 11:00 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0634 ± 0.329 (0.683) C:NA T:97%**	pCi/L	05/03/22 12:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.287 ± 0.306 (0.634) C:77% T:87%**	pCi/L	05/02/22 12:16	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.350 ± 0.635 (1.32)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Sample: FIELD BLANK SC POND **Lab ID: 40243486004** Collected: 04/12/22 11:20 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
		Pace Analytical Services - Greensburg				
Radium-226	EPA 903.1	**0.455 ± 0.426 (0.603) C:NA T:95%**	pCi/L	05/03/22 12:11	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**0.223 ± 0.340 (0.735) C:76% T:87%**	pCi/L	05/02/22 12:16	15262-20-1	
		Pace Analytical Services - Greensburg				
Total Radium	Total Radium Calculation	**0.678 ± 0.766 (1.34)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 498723
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

METHOD BLANK: 2413743 Matrix: Water
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.232 ± 0.242 (0.655) C:NA T:96%	pCi/L	05/03/22 11:40	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

QC Batch: 498724
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

METHOD BLANK: 2413744 Matrix: Water
Associated Lab Samples: 40243486001, 40243486002, 40243486003, 40243486004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.105 ± 0.277 (0.621) C:77% T:92%	pCi/L	05/02/22 12:14	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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 LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

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 at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40243486

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40243486001	**MW-308**	EPA 3010A	413354	EPA 6020B	413520
40243486002	**MW-306**	EPA 3010A	413354	EPA 6020B	413520
40243486003	**MW-307**	EPA 3010A	413354	EPA 6020B	413520
40243486004	**FIELD BLANK SC POND**	EPA 3010A	413354	EPA 6020B	413520
40243486001	**MW-308**	EPA 7470	413634	EPA 7470	413681
40243486002	**MW-306**	EPA 7470	413634	EPA 7470	413681
40243486003	**MW-307**	EPA 7470	413634	EPA 7470	413681
40243486004	**FIELD BLANK SC POND**	EPA 7470	413634	EPA 7470	413681
40243486001	**MW-308**				
40243486002	**MW-306**				
40243486003	**MW-307**				
40243486001	**MW-308**	EPA 903.1	498723		
40243486002	**MW-306**	EPA 903.1	498723		
40243486003	**MW-307**	EPA 903.1	498723		
40243486004	**FIELD BLANK SC POND**	EPA 903.1	498723		
40243486001	**MW-308**	EPA 904.0	498724		
40243486002	**MW-306**	EPA 904.0	498724		
40243486003	**MW-307**	EPA 904.0	498724		
40243486004	**FIELD BLANK SC POND**	EPA 904.0	498724		
40243486001	**MW-308**	Total Radium Calculation	502166		
40243486002	**MW-306**	Total Radium Calculation	502166		
40243486003	**MW-307**	Total Radium Calculation	502166		
40243486004	**FIELD BLANK SC POND**	Total Radium Calculation	502166		
40243486001	**MW-308**	SM 2540C	413340		
40243486002	**MW-306**	SM 2540C	413340		
40243486003	**MW-307**	SM 2540C	413340		
40243486004	**FIELD BLANK SC POND**	SM 2540C	413340		
40243486001	**MW-308**	EPA 9040	413997		
40243486002	**MW-306**	EPA 9040	413997		
40243486003	**MW-307**	EPA 9040	413997		
40243486004	**FIELD BLANK SC POND**	EPA 9040	413997		
40243486001	**MW-308**	EPA 300.0	414730		
40243486002	**MW-306**	EPA 300.0	415066		
40243486003	**MW-307**	EPA 300.0	415066		
40243486004	**FIELD BLANK SC POND**	EPA 300.0	415066		

#5

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here: 402434480

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers	Billing Information: same
Address: 2830 Dairy Dr.	
Report To: Meghan Blodgett	Email To: mblodgett@scsengineers.com
Copy To: Thomas Karwoski	Site Collection Info/Address: Columbia generating Station
Customer Project Name/Number: Columbia 25222067.00	State: WI County/City: Columbia/Portage Time Zone Collected: [ ] PT [ ] MT [X] CT [ ] ET
Phone: 608-324-2830 Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Adam Watson	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [X] No Analysis:

Container Preservative Type **: 1 1 U U

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Metals	Radium 226/228	PH	TDS, Cl, F, SO4	Lab Profile/Line:
~~MW-308~~													
MW-308	GW		4/11/22	1455				5	X	X	X	X	001
MW-306	GW		4/12/22	1120				5	X	X	X	X	002
MW-307	GW		4/12/22	1100				5	X	X	X	X	003
FieldBlankSCSmd	W		4/12/22	1120				5	X	X	X	X	004

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips:	

LAB USE ONLY:
Lab Sample # / Comments:

SUR 4/13/22

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2764172

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: S12-110
Cooler 1 Temp Upon Receipt: 2 oC
Cooler 1 Therm Corr. Factor: 0 oC
Cooler 1 Corrected Temp: 2 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
SCS	4/14/22 1030		
US Logistics	4/15/22 0710		4/15/22 0710

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: Page 24 of 26 of: _____

Sample Preservation Receipt Form

Client Name: SCS Project # 402434486

All containers needing preservation have been checked and noted below: ☒Yes ☐No ☐N/A

Initial when completed: [illegible] Date/Time:

Lab Lot# of pH paper: 100312 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass								Plastic					Vials						Jars				General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN							
001										2		1														2				✓		2.5 / 5 / 10
002										2		1														2				✓		2.5 / 5 / 10
003										2		1														2				✓		2.5 / 5 / 10
004										2		1														2				✓		2.5 / 5 / 10
005																																2.5 / 5 / 10
006																																2.5 / 5 / 10
007																																2.5 / 5 / 10
008																																2.5 / 5 / 10
009																																2.5 / 5 / 10
010																																2.5 / 5 / 10
011																																2.5 / 5 / 10
012																																2.5 / 5 / 10
013																																2.5 / 5 / 10
014																																2.5 / 5 / 10
015																																2.5 / 5 / 10
016																																2.5 / 5 / 10
017																																2.5 / 5 / 10
018																																2.5 / 5 / 10
019																																2.5 / 5 / 10
020																																2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: Rad Headspace in VOA Vials (>6mm): ☐Yes ☐No ☒N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9A	40 mL clear ascorbic	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG5U	100 mL amber glass unpres			VG9D	40 mL clear vial DI	ZPLC	ziploc bag
AG2S	500 mL amber glass H2SO4					GN	~~500mL~~ poly HNO3
BG3U	250 mL clear glass unpres						1 L

4/15/22 aw

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40243486

40243486

Client Name: SCS

Courier: ☐ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other: _____

Tracking #: _____

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

Custody Seal on Samples Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - 110 **Type of Ice:** Wet Blue Dry None ☐ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 2 /Corr: 2

Temp Blank Present: ☐ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 4/15/22 Initials: [illegible]
Labeled By Initials: [illegible]

Chain of Custody Present:	☐Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☐No ☐N/A	2. pgH 4/15/22
Chain of Custody Relinquished:	☐Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☐Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☐No	6.
Rush Turn Around Time Requested:	☐Yes ☐No	7.
Sufficient Volume: For Analysis: ☐Yes ☐No MS/MSD:	☐Yes ☐No ☐N/A	8.
Correct Containers Used:	☐Yes ☐No	9.
-Pace Containers Used:	☐Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☐N/A	
Containers Intact:	☐Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☐N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☐Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☐N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐
Person Contacted: _____ Date/Time: _____
Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample login

C2 April 2022 Background Well Assessment Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

May 13, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Matt Bizjack, Alliant Energy
Sherren Clark, SCS Engineers
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40243482001	**MW-84A**	Water	04/13/22 14:20	04/15/22 07:10
40243482002	**MW-301**	Water	04/13/22 15:40	04/15/22 07:10

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40243482001	**MW-84A**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40243482002	**MW-301**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			MEA	7	PASI-G
		EPA 903.1	RPS	1	PASI-PA
		EPA 904.0	JSM	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Sample: MW-84A **Lab ID: 40243482001** Collected: 04/13/22 14:20 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 02:08	7440-36-0	
Arsenic	**0.31J**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 02:08	7440-38-2	
Barium	**13.5**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 02:08	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 02:08	7440-41-7	
Boron	**10.5**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 02:08	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 02:08	7440-43-9	
Calcium	**75100**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 02:08	7440-70-2	
Chromium	**2.2J**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 02:08	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 02:08	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 02:08	7439-92-1	
Lithium	**0.36J**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 02:08	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 02:08	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 02:08	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 02:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 07:52	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.34**	Std. Units			1		04/13/22 14:20		
Field Specific Conductance	**600.2**	umhos/cm			1		04/13/22 14:20		
Oxygen, Dissolved	**9.33**	mg/L			1		04/13/22 14:20	7782-44-7	
REDOX	**200.6**	mV			1		04/13/22 14:20		
Turbidity	**0.00**	NTU			1		04/13/22 14:20		
Static Water Level	**785.02**	feet			1		04/13/22 14:20		
Temperature, Water (C)	**9.9**	deg C			1		04/13/22 14:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**334**	mg/L	20.0	8.7	1		04/15/22 16:44		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.6**	Std. Units	0.10	0.010	1		04/18/22 10:50		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**5.2**	mg/L	2.0	0.43	1		05/10/22 22:07	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/22 22:07	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		05/10/22 22:07	14808-79-8	M0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Sample: MW-301 **Lab ID: 40243482002** Collected: 04/13/22 15:40 Received: 04/15/22 07:10 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.31J**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 02:37	7440-36-0	
Arsenic	**0.47J**	ug/L	1.0	0.28	1	04/18/22 06:24	05/01/22 02:37	7440-38-2	
Barium	**7.8**	ug/L	2.3	0.70	1	04/18/22 06:24	05/01/22 02:37	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/18/22 06:24	05/01/22 02:37	7440-41-7	
Boron	**28.7**	ug/L	10.0	3.0	1	04/18/22 06:24	05/01/22 02:37	7440-42-8	
Cadmium	**0.30J**	ug/L	1.0	0.15	1	04/18/22 06:24	05/01/22 02:37	7440-43-9	
Calcium	**97300**	ug/L	254	76.2	1	04/18/22 06:24	05/01/22 02:37	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/18/22 06:24	05/01/22 02:37	7440-47-3	
Cobalt	**0.32J**	ug/L	1.0	0.12	1	04/18/22 06:24	05/01/22 02:37	7440-48-4	
Lead	**3.1**	ug/L	1.0	0.24	1	04/18/22 06:24	05/01/22 02:37	7439-92-1	
Lithium	**0.56J**	ug/L	1.0	0.22	1	04/18/22 06:24	05/01/22 02:37	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/18/22 06:24	05/01/22 02:37	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/18/22 06:24	05/01/22 02:37	7782-49-2	
Thallium	**0.32J**	ug/L	1.0	0.14	1	04/18/22 06:24	05/01/22 02:37	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	04/20/22 09:45	04/21/22 07:59	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.60**	Std. Units			1		04/13/22 15:40		
Field Specific Conductance	**747.0**	umhos/cm			1		04/13/22 15:40		
Oxygen, Dissolved	**2.47**	mg/L			1		04/13/22 15:40	7782-44-7	
REDOX	**207.5**	mV			1		04/13/22 15:40		
Turbidity	**0.00**	NTU			1		04/13/22 15:40		
Static Water Level	**785.44**	feet			1		04/13/22 15:40		
Temperature, Water (C)	**7.1**	deg C			1		04/13/22 15:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**422**	mg/L	20.0	8.7	1		04/15/22 16:44		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		04/18/22 10:53		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**1.9J**	mg/L	2.0	0.43	1		05/10/22 23:43	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/22 23:43	16984-48-8	
Sulfate	**12.7**	mg/L	2.0	0.44	1		05/10/22 23:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 413634
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2381580 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	04/21/22 07:47	

LABORATORY CONTROL SAMPLE: 2381581

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2381582 2381583

Parameter	Units	40243482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.0	5.0	100	101	85-115	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 413354
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2380530 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/01/22 00:40	
Arsenic	ug/L	<0.28	1.0	05/01/22 00:40	
Barium	ug/L	<0.70	2.3	05/01/22 00:40	
Beryllium	ug/L	<0.25	1.0	05/01/22 00:40	
Boron	ug/L	<3.0	10.0	05/01/22 00:40	
Cadmium	ug/L	<0.15	1.0	05/01/22 00:40	
Calcium	ug/L	<76.2	254	05/01/22 00:40	
Chromium	ug/L	<1.0	3.4	05/01/22 00:40	
Cobalt	ug/L	<0.12	1.0	05/01/22 00:40	
Lead	ug/L	<0.24	1.0	05/01/22 00:40	
Lithium	ug/L	<0.22	1.0	05/01/22 00:40	
Molybdenum	ug/L	<0.44	1.5	05/01/22 00:40	
Selenium	ug/L	<0.32	1.1	05/01/22 00:40	
Thallium	ug/L	<0.14	1.0	05/01/22 00:40	

LABORATORY CONTROL SAMPLE: 2380531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	261	104	80-120	
Arsenic	ug/L	250	263	105	80-120	
Barium	ug/L	250	249	99	80-120	
Beryllium	ug/L	250	270	108	80-120	
Boron	ug/L	250	250	100	80-120	
Cadmium	ug/L	250	268	107	80-120	
Calcium	ug/L	10000	9930	99	80-120	
Chromium	ug/L	250	254	102	80-120	
Cobalt	ug/L	250	248	99	80-120	
Lead	ug/L	250	266	106	80-120	
Lithium	ug/L	250	250	100	80-120	
Molybdenum	ug/L	250	249	100	80-120	
Selenium	ug/L	250	278	111	80-120	
Thallium	ug/L	250	252	101	80-120	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2380532 2380533

Parameter	Units	40243482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	250	250	256	257	102	103	75-125	0	20	
Arsenic	ug/L	0.31J	250	250	256	259	102	103	75-125	1	20	
Barium	ug/L	13.5	250	250	260	258	99	98	75-125	1	20	
Beryllium	ug/L	<0.25	250	250	260	260	104	104	75-125	0	20	
Boron	ug/L	10.5	250	250	255	248	98	95	75-125	3	20	
Cadmium	ug/L	<0.15	250	250	258	259	103	104	75-125	0	20	
Calcium	ug/L	75100	10000	10000	86700	85700	116	106	75-125	1	20	
Chromium	ug/L	2.2J	250	250	256	252	102	100	75-125	2	20	
Cobalt	ug/L	<0.12	250	250	244	241	98	96	75-125	1	20	
Lead	ug/L	<0.24	250	250	267	267	107	107	75-125	0	20	
Lithium	ug/L	0.36J	250	250	250	249	100	99	75-125	0	20	
Molybdenum	ug/L	<0.44	250	250	252	250	101	100	75-125	1	20	
Selenium	ug/L	<0.32	250	250	264	268	106	107	75-125	1	20	
Thallium	ug/L	<0.14	250	250	257	256	103	103	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 413340
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2380206 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/15/22 16:44	

LABORATORY CONTROL SAMPLE: 2380207

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	555	524	94	80-120	

SAMPLE DUPLICATE: 2380208

Parameter	Units	40243482001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	334	332	1	10	

SAMPLE DUPLICATE: 2380209

Parameter	Units	40243482002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	422	412	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 413406
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243482001, 40243482002

SAMPLE DUPLICATE: 2380677

Parameter	Units	40243487001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	10.7	10.7	0	20	H6

SAMPLE DUPLICATE: 2380701

Parameter	Units	40243447003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.5	8.4	1	20	1q,H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 414946
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2389209 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/10/22 20:23	
Fluoride	mg/L	<0.095	0.32	05/10/22 20:23	
Sulfate	mg/L	<0.44	2.0	05/10/22 20:23	

LABORATORY CONTROL SAMPLE: 2389210

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.1	106	90-110	
Fluoride	mg/L	2	2.1	107	90-110	
Sulfate	mg/L	20	21.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2389211 2389212

Parameter	Units	40243482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.2	20	20	25.3	25.6	101	102	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.2	106	108	90-110	2	15	
Sulfate	mg/L	1.4J	20	20	23.7	24.0	111	113	90-110	1	15	M0

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Sample: MW-84A **Lab ID: 40243482001** Collected: 04/13/22 14:20 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.254 ± 0.354 (0.590) C:NA T:97%**	pCi/L	05/03/22 12:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.357 ± 0.315 (0.634) C:76% T:90%**	pCi/L	05/02/22 12:15	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.611 ± 0.669 (1.22)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Sample: MW-301 **Lab ID: 40243482002** Collected: 04/13/22 15:40 Received: 04/15/22 07:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.000 ± 0.289 (0.649) C:NA T:99%**	pCi/L	05/03/22 12:11	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.179 ± 0.282 (0.610) C:80% T:92%**	pCi/L	05/02/22 12:15	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.179 ± 0.571 (1.26)**	pCi/L	05/04/22 22:02	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 498723
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2413743 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.232 ± 0.242 (0.655) C:NA T:96%	pCi/L	05/03/22 11:40	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

QC Batch: 498724
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40243482001, 40243482002

METHOD BLANK: 2413744 Matrix: Water
Associated Lab Samples: 40243482001, 40243482002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.105 ± 0.277 (0.621) C:77% T:92%	pCi/L	05/02/22 12:14	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

DEFINITIONS

Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
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 LOD.
J - Estimated concentration at or above the LOD and below the LOQ.
LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.
LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.
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 at or above the adjusted LOD.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067.00 COLUMBIA CCR BACK
Pace Project No.: 40243482

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40243482001	**MW-84A**	EPA 3010A	413354	EPA 6020B	413520
40243482002	**MW-301**	EPA 3010A	413354	EPA 6020B	413520
40243482001	**MW-84A**	EPA 7470	413634	EPA 7470	413681
40243482002	**MW-301**	EPA 7470	413634	EPA 7470	413681
40243482001	**MW-84A**				
40243482002	**MW-301**				
40243482001	**MW-84A**	EPA 903.1	498723		
40243482002	**MW-301**	EPA 903.1	498723		
40243482001	**MW-84A**	EPA 904.0	498724		
40243482002	**MW-301**	EPA 904.0	498724		
40243482001	**MW-84A**	Total Radium Calculation	502166		
40243482002	**MW-301**	Total Radium Calculation	502166		
40243482001	**MW-84A**	SM 2540C	413340		
40243482002	**MW-301**	SM 2540C	413340		
40243482001	**MW-84A**	EPA 9040	413406		
40243482002	**MW-301**	EPA 9040	413406		
40243482001	**MW-84A**	EPA 300.0	414946		
40243482002	**MW-301**	EPA 300.0	414946		

#1

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here: 40243482

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers	Billing Information: Same
Address: 2830 Dairy Dr. Madison, WI.	
Report To: Thomas Karwoski	Email To: mBlodgett@scsengineers.com
Copy To: Meghan Blodgett	Site Collection Info/Address:
Customer Project Name/Number: Columbia 25222067.00	State: WI County/City: Columbia/Portage Time Zone Collected: [ ] PT [ ] MT [ ] CT [ ] ET
Phone: 608-224-2830 Email:	Site/Facility ID #: Compliance Monitoring? [ ] Yes [ ] No
Collected By (print): Adam Dalton	Purchase Order #: Quote #: DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Immediately Packed on Ice: [Yes] [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: [ ] Hold:	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)
	Field Filtered (if applicable): [ ] Yes [No] Analysis:

Container Preservative Type **: 1 1 4 4

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Radium 226/228	Metals	pH	TDS, Cl, F, SO4	Lab Sample # / Comments
MW-84A			4/13/22	1420				5	x	x	x	x	40243482 001
MW-301			4/13/22	1540				5	x	x	x	x	002

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	Y N NA
Custody Signatures Present	Y N NA
Collector Signature Present	Y N NA
Bottles Intact	Y N NA
Correct Bottles	Y N NA
Sufficient Volume	Y N NA
Samples Received on Ice	Y N NA
VOA - Headspace Acceptable	Y N NA
USDA Regulated Soils	Y N NA
Samples in Holding Time	Y N NA
Residual Chlorine Present	Y N NA
Cl Strips:	
Sample pH Acceptable	Y N NA
pH Strips:	
Sulfide Present	Y N NA
Lead Acetate Strips: 4/15/22	

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2764151

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: (Y) N NA
Therm ID#: 113
Cooler 1 Temp Upon Receipt: 1 oC
Cooler 1 Therm Corr. Factor: .1 oC
Cooler 1 Corrected Temp: 1.1 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
SCS	4/14/22 1030		
CS logistics	4/15/22 0710	Thyke FED Pace	4/15/22 0710

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N (NA)
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: Page 19 of 21

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 40243482

All containers needing preservation have been checked and noted below: ☑Yes ☐No ☐N/A

Initial when completed: TP Date/ Time:

Lab Lot# of pH paper: 1CD3112 Lab Std #ID of preservation (if pH adjusted):

	Glass								Plastic					Vials						Jars				General								
Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001										2		1														2					X		2.5 / 5 / 10
002										2		1														2					X		2.5 / 5 / 10
003																																	2.5 / 5 / 10
004																																	2.5 / 5 / 10
005																																	2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

VP 4/15/22

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☑N/A ***If yes look in headspace column**

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	1L plastic HNO3

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40243482

40243482

Client Name: SCS Engineers

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other: _____

Tracking #: _____

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

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 113 **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1 /Corr: 1.1

Temp Blank Present: ☑ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 4/15/22 /Initials: TP

Labeled By Initials: AD

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. PM # TP 4/15/22
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD:	☐Yes ☑No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample login

C3 October 2022 Compliance Well Assessment Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 31, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Matt Bizjack, Alliant Energy
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40253969001	**MW-308**	Water	10/25/22 14:50	10/31/22 09:15
40253969002	**FIELD BLANK-SCPOND**	Water	10/26/22 16:48	10/31/22 09:15
40253969003	**MW-306**	Water	10/26/22 09:50	10/31/22 15:38
40253969004	**MW-307**	Water	10/26/22 09:50	10/31/22 15:38

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40253969001	**MW-308**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			JXA	7	PASI-G
		EPA 903.1	JDZ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40253969002	**FIELD BLANK-SCPOND**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	JDZ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40253969003	**MW-306**		JXA	1	PASI-G
40253969004	**MW-307**		JXA	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: MW-308 **Lab ID: 40253969001** Collected: 10/25/22 14:50 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	12/01/22 19:28	7440-36-0	
Arsenic	**4.5**	ug/L	1.0	0.28	1	11/18/22 06:38	11/30/22 15:01	7440-38-2	
Barium	**54.0**	ug/L	2.3	0.70	1	11/18/22 06:38	12/01/22 19:28	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	11/18/22 06:38	12/01/22 19:28	7440-41-7	
Boron	**667**	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 15:01	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 15:01	7440-43-9	
Calcium	**125000**	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 15:01	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	11/18/22 06:38	11/30/22 15:01	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	11/18/22 06:38	11/30/22 15:01	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	11/18/22 06:38	11/30/22 15:01	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	11/18/22 06:38	11/30/22 15:01	7439-93-2	
Molybdenum	**0.87J**	ug/L	1.5	0.44	1	11/18/22 06:38	11/30/22 15:01	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	11/18/22 06:38	11/30/22 15:01	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	11/18/22 06:38	11/30/22 15:01	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	11/03/22 07:25	11/04/22 08:11	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.15**	Std. Units			1		10/25/22 14:50		
Field Specific Conductance	**900**	umhos/cm			1		10/25/22 14:50		
Oxygen, Dissolved	**0.05**	mg/L			1		10/25/22 14:50	7782-44-7	
REDOX	**-28.3**	mV			1		10/25/22 14:50		
Turbidity	**1.92**	NTU			1		10/25/22 14:50		
Static Water Level	**784.16**	feet			1		10/25/22 14:50		
Temperature, Water (C)	**13.5**	deg C			1		10/25/22 14:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**492**	mg/L	20.0	8.7	1		11/01/22 11:33		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.2**	Std. Units	0.10	0.010	1		11/07/22 10:23		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**1.7J**	mg/L	2.0	0.43	1		11/12/22 16:39	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/14/22 15:09	16984-48-8	
Sulfate	**0.55J**	mg/L	2.0	0.44	1		11/12/22 16:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: FIELD BLANK-SCPOND **Lab ID: 40253969002** Collected: 10/26/22 16:48 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	12/01/22 19:35	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	11/18/22 06:38	11/30/22 15:08	7440-38-2	
Barium	**<0.70**	ug/L	2.3	0.70	1	11/18/22 06:38	12/01/22 19:35	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	11/18/22 06:38	12/01/22 19:35	7440-41-7	
Boron	**<3.0**	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 15:08	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 15:08	7440-43-9	
Calcium	**92.4J**	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 15:08	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	11/18/22 06:38	11/30/22 15:08	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	11/18/22 06:38	11/30/22 15:08	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	11/18/22 06:38	11/30/22 15:08	7439-92-1	
Lithium	**<0.22**	ug/L	1.0	0.22	1	11/18/22 06:38	11/30/22 15:08	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	11/18/22 06:38	11/30/22 15:08	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	11/18/22 06:38	11/30/22 15:08	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	11/18/22 06:38	11/30/22 15:08	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	11/03/22 07:25	11/04/22 08:14	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		11/01/22 11:33		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**5.8**	Std. Units	0.10	0.010	1		11/07/22 10:34		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		11/12/22 16:54	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/14/22 15:23	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		11/12/22 16:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: MW-306 **Lab ID: 40253969003** Collected: 10/26/22 09:50 Received: 10/31/22 15:38 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Static Water Level	**778.32**	feet			1		10/26/22 09:50		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: MW-307 **Lab ID: 40253969004** Collected: 10/26/22 09:50 Received: 10/31/22 15:38 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Static Water Level	**777.89**	feet			1		10/26/22 09:50		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 430492
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2479204 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	11/04/22 07:30	

LABORATORY CONTROL SAMPLE: 2479205

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2479206 2479207

Parameter	Units	40253959001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.0	4.8	100	95	85-115	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 431884
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2487054 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	0.19J	1.0	11/30/22 12:41	
Arsenic	ug/L	<0.28	1.0	11/30/22 12:41	
Barium	ug/L	<0.70	2.3	12/01/22 17:30	
Beryllium	ug/L	<0.25	1.0	12/01/22 17:30	
Boron	ug/L	<3.0	10.0	11/30/22 12:41	
Cadmium	ug/L	0.20J	1.0	11/30/22 12:41	
Calcium	ug/L	<76.2	254	11/30/22 12:41	
Chromium	ug/L	<1.0	3.4	11/30/22 12:41	
Cobalt	ug/L	0.18J	1.0	11/30/22 12:41	
Lead	ug/L	<0.24	1.0	11/30/22 12:41	
Lithium	ug/L	<0.22	1.0	11/30/22 12:41	
Molybdenum	ug/L	<0.44	1.5	11/30/22 12:41	
Selenium	ug/L	<0.32	1.1	11/30/22 12:41	
Thallium	ug/L	0.18J	1.0	11/30/22 12:41	

LABORATORY CONTROL SAMPLE: 2487055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	270	108	80-120	
Arsenic	ug/L	250	261	104	80-120	
Barium	ug/L	250	242	97	80-120	
Beryllium	ug/L	250	262	105	80-120	
Boron	ug/L	250	253	101	80-120	
Cadmium	ug/L	250	264	105	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	254	102	80-120	
Cobalt	ug/L	250	249	99	80-120	
Lead	ug/L	250	259	104	80-120	
Lithium	ug/L	250	263	105	80-120	
Molybdenum	ug/L	250	255	102	80-120	
Selenium	ug/L	250	272	109	80-120	
Thallium	ug/L	250	259	104	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056 2487057

Parameter	Units	40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	250	250	268	263	107	105	75-125	2	20	
Arsenic	ug/L	0.30J	250	250	260	260	104	104	75-125	0	20	
Barium	ug/L	7.5	250	250	250	245	97	95	75-125	2	20	
Beryllium	ug/L	<0.25	250	250	268	265	107	106	75-125	1	20	
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20	
Cadmium	ug/L	<0.15	250	250	259	254	104	102	75-125	2	20	
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	20	P6
Chromium	ug/L	<1.0	250	250	251	247	100	99	75-125	1	20	
Cobalt	ug/L	0.46J	250	250	247	244	99	97	75-125	1	20	
Lead	ug/L	<0.24	250	250	260	257	104	103	75-125	1	20	
Lithium	ug/L	0.37J	250	250	272	255	109	102	75-125	6	20	
Molybdenum	ug/L	<0.44	250	250	256	255	102	102	75-125	0	20	
Selenium	ug/L	<0.32	250	250	271	267	108	107	75-125	1	20	
Thallium	ug/L	<0.14	250	250	258	257	103	103	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 430299
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2477981 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	11/01/22 11:27	

LABORATORY CONTROL SAMPLE: 2477982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	585	546	93	80-120	

SAMPLE DUPLICATE: 2477983

Parameter	Units	40253952003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	658	652	1	10	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 430730
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253969001, 40253969002

SAMPLE DUPLICATE: 2480730

Parameter	Units	40254060003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.7	2	20	1q,H6,PI

SAMPLE DUPLICATE: 2480795

Parameter	Units	40253969001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 430807
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2480961 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/12/22 12:34	
Fluoride	mg/L	<0.095	0.32	11/14/22 11:33	
Sulfate	mg/L	<0.44	2.0	11/12/22 12:34	

LABORATORY CONTROL SAMPLE: 2480962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.4	97	90-110	
Fluoride	mg/L	2	1.9	97	90-110	
Sulfate	mg/L	20	19.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480963 2480964

Parameter	Units	40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.3	20	20	24.1	24.2	109	110	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.5	2.4	123	121	90-110	2	15	M0
Sulfate	mg/L	11.6	20	20	32.8	33.1	106	107	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: MW-308 **Lab ID: 40253969001** Collected: 10/25/22 14:50 Received: 10/31/22 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.0500 ± 0.228 (0.136) C:NA T:91%**	pCi/L	11/22/22 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.750 ± 0.376 (0.658) C:82% T:91%**	pCi/L	11/16/22 15:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.800 ± 0.604 (0.794)**	pCi/L	11/22/22 17:11	7440-14-4	

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Sample: FIELD BLANK-SCPOND **Lab ID: 40253969002** Collected: 10/26/22 16:48 Received: 10/31/22 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.370 ± 0.277 (0.143) C:NA T:89%**	pCi/L	11/22/22 13:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.0243 ± 0.321 (0.740) C:77% T:89%**	pCi/L	11/16/22 15:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.394 ± 0.598 (0.883)**	pCi/L	11/22/22 17:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 544795
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2644705 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.113 ± 0.314 (0.610) C:NA T:88%	pCi/L	11/22/22 12:52	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

QC Batch: 544797
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40253969001, 40253969002

METHOD BLANK: 2644706 Matrix: Water
Associated Lab Samples: 40253969001, 40253969002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.565 ± 0.314 (0.566) C:89% T:88%	pCi/L	11/16/22 11:48	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

DEFINITIONS

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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 LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

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 at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
PI	The precision between the sample and the duplicate sample exceeded laboratory control limits.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR SEC POND
Pace Project No.: 40253969

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40253969001	**MW-308**	EPA 3010A	431884	EPA 6020B	431956
40253969002	**FIELD BLANK-SCPOND**	EPA 3010A	431884	EPA 6020B	431956
40253969001	**MW-308**	EPA 7470	430492	EPA 7470	430560
40253969002	**FIELD BLANK-SCPOND**	EPA 7470	430492	EPA 7470	430560
40253969001	**MW-308**				
40253969003	**MW-306**				
40253969004	**MW-307**				
40253969001	**MW-308**	EPA 903.1	544795		
40253969002	**FIELD BLANK-SCPOND**	EPA 903.1	544795		
40253969001	**MW-308**	EPA 904.0	544797		
40253969002	**FIELD BLANK-SCPOND**	EPA 904.0	544797		
40253969001	**MW-308**	Total Radium Calculation	549026		
40253969002	**FIELD BLANK-SCPOND**	Total Radium Calculation	549026		
40253969001	**MW-308**	SM 2540C	430299		
40253969002	**FIELD BLANK-SCPOND**	SM 2540C	430299		
40253969001	**MW-308**	EPA 9040	430730		
40253969002	**FIELD BLANK-SCPOND**	EPA 9040	430730		
40253969001	**MW-308**	EPA 300.0	430807		
40253969002	**FIELD BLANK-SCPOND**	EPA 300.0	430807		

40253969

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS ENGINEERS	Report To:	Meghan Blodgett	Attention:	
Address:	2830 Dairy Drive	Copy To:		Company Name:	
Madison, WI 53718				Address:	
Email:	mblodgett@scsengineers.com	Purchase Order #:		Pace Quote:	
Phone:	608-216-7362 Fax:	Project Name:	25219067 Columbia CCR Secondary Pond	Pace Project Manager:	dan.milewsky@pacelabs.com,
Requested Due Date:		Project #:	25222067	Pace Profile #:	3946-12

Regulatory Agency	
State / Location	WI

MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

Requested Analysis Filtered (Y/N): Metals N; chloride,fluoride,sulfate N; TDS and pH N; Radium 226 N; Radium 228 N

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals	chloride,fluoride,sulfate	TDS and pH	Radium 226	Radium 228	Residual Chlorine (Y/N)	
1	MW-306 Not sampled	WT																	X	X	X	X	X		
2	MW-307 Not sampled	WT																	X	X	X	X	X		
3	MW-308	WT				10/25/22	1450		5	2		3							X	X	X	X	X		001
4	FIELD BLANK-SCPOND	WT				10/26/22	1648		5	2		3							X	X	X	X	X		002
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
ALL SAMPLES UNFILTERED Metals=Sb,As,Ba,Be,B,Ca,Cd,Cr,Co,Pb,Li,Hg,Mo,Se,Tl	Adam Watson SCS Eng	10/28/22	1530	~~[illegible]~~ MLS 10/31/22	~~10/29/22~~	~~9:00~~				
	CS Logistics	10/29/22	0915	[illegible signature]	10/29/22	0915	.2	Y	N	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:					
SIGNATURE of SAMPLER:	DATE Signed:				

Sample Preservation Receipt Form

Client Name: SCS Project # 40253969

All containers needing preservation have been checked and noted below: ☑Yes ☐No ☐N/A Initial when completed: MH Date/ Time:

Lab Lot# of pH paper: 1000722 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	Vials: VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: SP5T	ZPLC	GN 1	GN 2	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001									2		1															2						X		2.5 / 5
002									2		1															2						X		2.5 / 5
003																																		2.5 / 5
004																																		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
010																																		2.5 / 5
011																																		2.5 / 5
012																																		2.5 / 5
013																																		2.5 / 5
014																																		2.5 / 5
015			MW 10/31/24																															2.5 / 5
016																																		2.5 / 5
017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☐N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	VG9C	40 mL clear ascorbic w/ HCl	JGFU	4 oz amber jar unpres
BG1U	1 liter clear glass	BP3U	250 mL plastic unpres	DG9T	40 mL amber Na Thio	JG9U	9 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP3B	250 mL plastic NaOH	VG9U	40 mL clear vial unpres	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1L poly HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40253969

40253969

Client Name: SCS

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other: _____

Tracking #: _____

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

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - 123 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 0 /Corr: 0.2

Temp Blank Present: ☐ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents:
Date: 10/31/22 /Initials: MA

Labeled By Initials: MR

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☐No ☑N/A		8.
Correct Containers Used: ☑Yes ☐No Correct Type: Pace Green Bay, Pace IR, Non-Pace		9.
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: ☑Yes ☐No ☐N/A -Includes date/time/ID/Analysis Matrix: W		12.
Trip Blank Present: ☐Yes ☐No ☑N/A Trip Blank Custody Seals Present ☐Yes ☐No ☑N/A Pace Trip Blank Lot # (if purchased): _____		13.

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi

Page 2 of 2

C4 October 2022 Background Well Assessment Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay
- Pace Analytical Services - Greensburg

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Matt Bizjack, Alliant Energy
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Pace Analytical Services Pennsylvania
1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40253965001	**MW-301**	Water	10/27/22 16:35	10/29/22 09:15
40253965002	**MW-84A**	Water	10/27/22 15:25	10/29/22 09:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40253965001	**MW-301**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			JXA	7	PASI-G
		EPA 903.1	JDZ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40253965002	**MW-84A**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			JXA	7	PASI-G
		EPA 903.1	JDZ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

PASI-G = Pace Analytical Services - Green Bay
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Sample: MW-301 **Lab ID: 40253965001** Collected: 10/27/22 16:35 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 11:56	7440-36-0	
Arsenic	**0.30J**	ug/L	1.0	0.28	1	11/18/22 06:38	11/30/22 11:56	7440-38-2	
Barium	**7.5**	ug/L	2.3	0.70	1	11/18/22 06:38	12/01/22 17:45	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	11/18/22 06:38	12/01/22 17:45	7440-41-7	
Boron	**37.5**	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 11:56	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 11:56	7440-43-9	
Calcium	**62800**	ug/L	2540	762	10	11/18/22 06:38	11/30/22 12:55	7440-70-2	P6
Chromium	**<1.0**	ug/L	3.4	1.0	1	11/18/22 06:38	11/30/22 11:56	7440-47-3	
Cobalt	**0.46J**	ug/L	1.0	0.12	1	11/18/22 06:38	11/30/22 11:56	7440-48-4	B
Lead	**<0.24**	ug/L	1.0	0.24	1	11/18/22 06:38	11/30/22 11:56	7439-92-1	
Lithium	**0.37J**	ug/L	1.0	0.22	1	11/18/22 06:38	11/30/22 11:56	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	11/18/22 06:38	11/30/22 11:56	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	11/18/22 06:38	11/30/22 11:56	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	11/18/22 06:38	11/30/22 11:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	11/03/22 07:25	11/04/22 08:00	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.80**	Std. Units			1		10/27/22 16:35		
Field Specific Conductance	**507.5**	umhos/cm			1		10/27/22 16:35		
Oxygen, Dissolved	**0.10**	mg/L			1		10/27/22 16:35	7782-44-7	
REDOX	**80.9**	mV			1		10/27/22 16:35		
Turbidity	**0.00**	NTU			1		10/27/22 16:35		
Static Water Level	**784.91**	feet			1		10/27/22 16:35		
Temperature, Water (C)	**10.8**	deg C			1		10/27/22 16:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**282**	mg/L	20.0	8.7	1		11/01/22 11:31		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.3**	mg/L	2.0	0.43	1		11/12/22 13:03	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/14/22 12:02	16984-48-8	M0
Sulfate	**11.6**	mg/L	2.0	0.44	1		11/12/22 13:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Sample: MW-84A **Lab ID: 40253965002** Collected: 10/27/22 15:25 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**0.29J**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 13:25	7440-36-0	B
Arsenic	**0.72J**	ug/L	1.0	0.28	1	11/18/22 06:38	11/30/22 13:25	7440-38-2	
Barium	**13.7**	ug/L	2.3	0.70	1	11/18/22 06:38	12/01/22 18:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	11/18/22 06:38	12/01/22 18:14	7440-41-7	
Boron	**12.2**	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 13:25	7440-42-8	
Cadmium	**0.22J**	ug/L	1.0	0.15	1	11/18/22 06:38	11/30/22 13:25	7440-43-9	B
Calcium	**78400**	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 13:25	7440-70-2	
Chromium	**2.2J**	ug/L	3.4	1.0	1	11/18/22 06:38	11/30/22 13:25	7440-47-3	
Cobalt	**0.25J**	ug/L	1.0	0.12	1	11/18/22 06:38	11/30/22 13:25	7440-48-4	B
Lead	**0.26J**	ug/L	1.0	0.24	1	11/18/22 06:38	11/30/22 13:25	7439-92-1	
Lithium	**0.41J**	ug/L	1.0	0.22	1	11/18/22 06:38	11/30/22 13:25	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	11/18/22 06:38	11/30/22 13:25	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	11/18/22 06:38	11/30/22 13:25	7782-49-2	
Thallium	**0.33J**	ug/L	1.0	0.14	1	11/18/22 06:38	11/30/22 13:25	7440-28-0	B
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay								
Mercury	**<0.066**	ug/L	0.20	0.066	1	11/03/22 07:25	11/04/22 08:02	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.31**	Std. Units			1		10/27/22 15:25		
Field Specific Conductance	**585.2**	umhos/cm			1		10/27/22 15:25		
Oxygen, Dissolved	**8.31**	mg/L			1		10/27/22 15:25	7782-44-7	
REDOX	**39.9**	mV			1		10/27/22 15:25		
Turbidity	**0.00**	NTU			1		10/27/22 15:25		
Static Water Level	**784.57**	feet			1		10/27/22 15:25		
Temperature, Water (C)	**11.7**	deg C			1		10/27/22 15:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**302**	mg/L	20.0	8.7	1		11/01/22 11:32		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		11/03/22 13:56		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.4**	mg/L	2.0	0.43	1		11/12/22 14:11	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		11/14/22 12:45	16984-48-8	
Sulfate	**1.1J**	mg/L	2.0	0.44	1		11/12/22 14:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 430492
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2479204 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	11/04/22 07:30	

LABORATORY CONTROL SAMPLE: 2479205

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2479206 2479207

Parameter	Units	40253959001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.066	5	5	5.0	4.8	100	95	85-115	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 431884
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2487054 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	0.19J	1.0	11/30/22 12:41	
Arsenic	ug/L	<0.28	1.0	11/30/22 12:41	
Barium	ug/L	<0.70	2.3	12/01/22 17:30	
Beryllium	ug/L	<0.25	1.0	12/01/22 17:30	
Boron	ug/L	<3.0	10.0	11/30/22 12:41	
Cadmium	ug/L	0.20J	1.0	11/30/22 12:41	
Calcium	ug/L	<76.2	254	11/30/22 12:41	
Chromium	ug/L	<1.0	3.4	11/30/22 12:41	
Cobalt	ug/L	0.18J	1.0	11/30/22 12:41	
Lead	ug/L	<0.24	1.0	11/30/22 12:41	
Lithium	ug/L	<0.22	1.0	11/30/22 12:41	
Molybdenum	ug/L	<0.44	1.5	11/30/22 12:41	
Selenium	ug/L	<0.32	1.1	11/30/22 12:41	
Thallium	ug/L	0.18J	1.0	11/30/22 12:41	

LABORATORY CONTROL SAMPLE: 2487055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	270	108	80-120	
Arsenic	ug/L	250	261	104	80-120	
Barium	ug/L	250	242	97	80-120	
Beryllium	ug/L	250	262	105	80-120	
Boron	ug/L	250	253	101	80-120	
Cadmium	ug/L	250	264	105	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	254	102	80-120	
Cobalt	ug/L	250	249	99	80-120	
Lead	ug/L	250	259	104	80-120	
Lithium	ug/L	250	263	105	80-120	
Molybdenum	ug/L	250	255	102	80-120	
Selenium	ug/L	250	272	109	80-120	
Thallium	ug/L	250	259	104	80-120	

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056 2487057

Parameter	Units	40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	250	250	268	263	107	105	75-125	2	20	
Arsenic	ug/L	0.30J	250	250	260	260	104	104	75-125	0	20	
Barium	ug/L	7.5	250	250	250	245	97	95	75-125	2	20	
Beryllium	ug/L	<0.25	250	250	268	265	107	106	75-125	1	20	
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20	
Cadmium	ug/L	<0.15	250	250	259	254	104	102	75-125	2	20	
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	20	P6
Chromium	ug/L	<1.0	250	250	251	247	100	99	75-125	1	20	
Cobalt	ug/L	0.46J	250	250	247	244	99	97	75-125	1	20	
Lead	ug/L	<0.24	250	250	260	257	104	103	75-125	1	20	
Lithium	ug/L	0.37J	250	250	272	255	109	102	75-125	6	20	
Molybdenum	ug/L	<0.44	250	250	256	255	102	102	75-125	0	20	
Selenium	ug/L	<0.32	250	250	271	267	108	107	75-125	1	20	
Thallium	ug/L	<0.14	250	250	258	257	103	103	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 430299
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2477981 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	11/01/22 11:27	

LABORATORY CONTROL SAMPLE: 2477982

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	585	546	93	80-120	

SAMPLE DUPLICATE: 2477983

Parameter	Units	40253952003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	658	652	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 430502
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253965001, 40253965002

SAMPLE DUPLICATE: 2479241

Parameter	Units	40253453001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	20	H6

SAMPLE DUPLICATE: 2479545

Parameter	Units	40253825003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 430807
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2480961 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/12/22 12:34	
Fluoride	mg/L	<0.095	0.32	11/14/22 11:33	
Sulfate	mg/L	<0.44	2.0	11/12/22 12:34	

LABORATORY CONTROL SAMPLE: 2480962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.4	97	90-110	
Fluoride	mg/L	2	1.9	97	90-110	
Sulfate	mg/L	20	19.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480963 2480964

Parameter	Units	40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.3	20	20	24.1	24.2	109	110	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.5	2.4	123	121	90-110	2	15	M0
Sulfate	mg/L	11.6	20	20	32.8	33.1	106	107	90-110	1	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Sample: MW-301 **Lab ID: 40253965001** Collected: 10/27/22 16:35 Received: 10/29/22 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**-0.169 ± 0.429 (0.940) C:NA T:90%**	pCi/L	11/22/22 13:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.00292 ± 0.343 (0.793) C:79% T:90%**	pCi/L	11/16/22 15:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.00292 ± 0.772 (1.73)**	pCi/L	11/22/22 17:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Sample: MW-84A **Lab ID: 40253965002** Collected: 10/27/22 15:25 Received: 10/29/22 09:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	**0.267 ± 0.279 (0.393) C:NA T:96%**	pCi/L	11/22/22 13:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.406 ± 0.346 (0.700) C:82% T:96%**	pCi/L	11/16/22 15:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.673 ± 0.625 (1.09)**	pCi/L	11/22/22 17:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 544795
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2644705 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.113 ± 0.314 (0.610) C:NA T:88%	pCi/L	11/22/22 12:52	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

QC Batch: 544797
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2644706 Matrix: Water
Associated Lab Samples: 40253965001, 40253965002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.565 ± 0.314 (0.566) C:89% T:88%	pCi/L	11/16/22 11:48	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

DEFINITIONS

Act - Activity
Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)
(MDC) - Minimum Detectable Concentration
Trac - Tracer Recovery (%)
Carr - Carrier Recovery (%)
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 LOD.
J - Estimated concentration at or above the LOD and below the LOQ.
LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.
LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.
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 at or above the adjusted LOD.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40253965

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40253965001	**MW-301**	EPA 3010A	431884	EPA 6020B	431956
40253965002	**MW-84A**	EPA 3010A	431884	EPA 6020B	431956
40253965001	**MW-301**	EPA 7470	430492	EPA 7470	430560
40253965002	**MW-84A**	EPA 7470	430492	EPA 7470	430560
40253965001	**MW-301**				
40253965002	**MW-84A**				
40253965001	**MW-301**	EPA 903.1	544795		
40253965002	**MW-84A**	EPA 903.1	544795		
40253965001	**MW-301**	EPA 904.0	544797		
40253965002	**MW-84A**	EPA 904.0	544797		
40253965001	**MW-301**	Total Radium Calculation	549026		
40253965002	**MW-84A**	Total Radium Calculation	549026		
40253965001	**MW-301**	SM 2540C	430299		
40253965002	**MW-84A**	SM 2540C	430299		
40253965001	**MW-301**	EPA 9040	430502		
40253965002	**MW-84A**	EPA 9040	430502		
40253965001	**MW-301**	EPA 300.0	430807		
40253965002	**MW-84A**	EPA 300.0	430807		

40253965

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: SCS ENGINEERS	Report To: Meghan Blodgett	Attention:	
Address: 2830 Dairy Drive	Copy To:	Company Name:	
Madison, WI 53718		Address:	Regulatory Agency
Email: mblodgett@scsengineers.com	Purchase Order #:	Pace Quote:	
Phone: 608-216-7362 Fax:	Project Name: 25219067 Columbia CCR Background	Pace Project Manager: dan.milewsky@pacelabs.com,	State / Location
Requested Due Date:	Project #: 25222067	Pace Profile #: 3946-12	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Radium 226	Radium 228	Metals	TDS and pH	Chloride, Fluoride, Sulfate	Residual Chlorine (Y/N)	
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS																	Requested Analysis Filtered (Y/N)	N	N	N	N	N		
1	MW-301	WT				10/27/22	1635												X	X	X	X	X		001
2	MW-84A	WT				10/27/22	1525												X	X	X	X	X		002
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson SCS Eng	10/28/22	1538		10/29/22	915	0.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

TEMP in C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # L1253965

All containers needing preservation have been checked and noted below: ☑Yes ☐No ☐N/A Initial when completed: SB Date/ Time:

Lab Lot# of pH paper: WB0722 Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass: AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	Plastic: BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	Vials: VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	JG9U	WGFU	WPFU	General: SP5T	ZPLC	GN 1	GN 2	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001									2		1															2					X		2.5 / 5
002									2		1															2					X		2.5 / 5
003																																		2.5 / 5
004																																		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
010																																		2.5 / 5
011																																		2.5 / 5
012																																		2.5 / 5
013																																		2.5 / 5
014																																		2.5 / 5
015																																		2.5 / 5
016																																		2.5 / 5
017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

10/3/22 SB

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: Radium

Headspace in VOA Vials (>6mm) : ☐Yes ☐No ☑N/A ***If yes look in headspace column**

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4
BP2Z	500 mL plastic NaOH + Zn

VG9C	40 mL clear ascorbic w/ HCl
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN 1	1 Liter plastic NaOH
GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40253965

40253965

Client Name: SCS Engineering

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other: _____

Tracking #: _____

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

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other _____

Thermometer Used SR - 123 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 0 /Corr: 0.2

Temp Blank Present: ☑ yes ☐ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Person examining contents:
Date: 10/31/22 /Initials: SG

Labeled By Initials: NK

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
Correct Type: Pace Green Bay, Pace IR, Non-Pace		
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☑Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample logi

Page 2 of 2

C5 October 2022 Background Well Re-Test Assessment Monitoring

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

December 29, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Matt Bizjack, Alliant Energy
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40255945001	**MW-301**	Water	10/27/22 16:35	12/14/22 09:20
40255945002	**MW-84A**	Water	10/27/22 15:25	12/14/22 09:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40255945001	**MW-301**	EPA 6020B	KXS	1
40255945002	**MW-84A**	EPA 6020B	KXS	5

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Sample: MW-301 **Lab ID: 40255945001** Collected: 10/27/22 16:35 Received: 12/14/22 09:20 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Cobalt	**0.52J**	ug/L	1.0	0.12	1	12/19/22 06:07	12/21/22 03:38	7440-48-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Sample: MW-84A **Lab ID: 40255945002** Collected: 10/27/22 15:25 Received: 12/14/22 09:20 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Antimony	**<0.15**	ug/L	1.0	0.15	1	12/19/22 06:07	12/21/22 03:46	7440-36-0	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	12/19/22 06:07	12/21/22 03:46	7440-43-9	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	12/19/22 06:07	12/21/22 03:46	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	12/19/22 06:07	12/21/22 03:46	7439-92-1	
Thallium	**<0.14**	ug/L	1.0	0.14	1	12/19/22 06:07	12/21/22 03:46	7440-28-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

QC Batch: 434044
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40255945001, 40255945002

METHOD BLANK: 2498851 Matrix: Water
Associated Lab Samples: 40255945001, 40255945002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	12/21/22 00:57	
Cadmium	ug/L	<0.15	1.0	12/21/22 00:57	
Cobalt	ug/L	<0.12	1.0	12/21/22 00:57	
Lead	ug/L	<0.24	1.0	12/21/22 00:57	
Thallium	ug/L	<0.14	1.0	12/21/22 00:57	

LABORATORY CONTROL SAMPLE: 2498852

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	242	97	80-120	
Cadmium	ug/L	250	242	97	80-120	
Cobalt	ug/L	250	237	95	80-120	
Lead	ug/L	250	237	95	80-120	
Thallium	ug/L	250	228	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2498853 2498854

Parameter	Units	40255857001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	5.8J	250	250	256	247	100	96	75-125	4	20	
Cadmium	ug/L	8.2J	250	250	250	246	97	95	75-125	2	20	
Cobalt	ug/L	5.2J	250	250	247	242	97	95	75-125	2	20	
Lead	ug/L	5.5J	250	250	250	245	98	96	75-125	2	20	
Thallium	ug/L	2.9J	250	250	235	232	93	91	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

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 LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

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 at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND
Pace Project No.: 40255945

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40255945001	**MW-301**	EPA 3010A	434044	EPA 6020B	434141
40255945002	**MW-84A**	EPA 3010A	434044	EPA 6020B	434141

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

40253965

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at https://info.pacelabs.com/hubfs/pas-standard-terms.pdf.

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: SCS ENGINEERS	Report To: Meghan Blodgett	Attention:	
Address: 2830 Dairy Drive	Copy To:	Company Name:	
Madison, WI 53718		Address:	Regulatory Agency
Email: mblodgett@scsengineers.com	Purchase Order #:	Pace Quote:	
Phone: 608-216-7362 Fax:	Project Name: 25219067 Columbia CCR Background	Pace Project Manager: dan.milewsky@pacelabs.com,	State / Location
Requested Due Date:	Project #: 25222067	Pace Profile #: 3946-12	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	
	MATRIX CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS																				
																			N		
																		Analyses Test	Radium 226	Radium 228	Metals	TDS and pH	Chloride, Fluoride, Sulfate
1	MW-301	WT				10/27/22	1635												X	X	X	X	X
2	MW-84A	WT				10/27/22	1525												X	X	X	X	X
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Adam Watson SCS Eng	10/28/22	1538		10/29/22	915	0.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed:

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

001
002

Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 23

Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022
Boron	ug/L	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1	13.6	12	15.7	10	9.7	14.3	11.1	10.5	12.2
Calcium	ug/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700	77600	69200	69100	75300	75100	78400
Chloride	mg/L	4.9	4.7	5.1	--	4.3	4.7	4.6	4.9	5.5	5.5	5.1	4.8	4.9	4.2	3.6	3.9	3.7	3.7	4.3	4.4	3.5	5.2	3.4
Fluoride	mg/L	<0.2	<0.2	<0.2	--	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	7.6	7.61	7.45	7.34	7.91	7.25	6.99	7.8	7.28	7.23	7.68	7.45	7.38	7.24	7.03	7.23	7.51	7.34	7.49	7.34	7.42	7.34	7.31
Sulfate	mg/L	4.9	4.3	3.7	--	2.6	2.7	3	2.8	2.7	2	2.2	2.8	1.9	1.6	1.4	1.3	<2.2	1.5	1.3	1.4	1.3	1.4	1.1
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316	340	320	328	326	334	302
Antimony	ug/L	<0.073	0.084	0.1	--	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.55	<0.15	<0.15	<0.15
Arsenic	ug/L	0.15	0.29	0.14	--	0.35	0.19	0.35	<0.099	<0.28	0.28	--	<0.28	<0.28	0.33	<0.28	0.46	0.38	0.34	0.49	0.91	0.41	0.31	0.72
Barium	ug/L	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2	14	13.9	12.6	13.4	12.9	13.5	13.7
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	--	<0.25	<0.25	0.47	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.53	<0.15	<0.15	<0.15
Chromium	ug/L	2.5	1.9	1.8	--	2	2	1.9	2.4	2	1.6	--	2.4	1.5	1.6	1.8	1.6	1.6	1.7	1.6	2.6	1.9	2.2	2.2
Cobalt	ug/L	0.095	<0.036	0.053	--	<0.036	<0.036	<0.036	<0.036	<0.085	<0.085	--	<0.085	<0.085	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.52	0.12	<0.12	<0.12
Lead	ug/L	0.16	<0.04	0.39	--	0.049	0.11	<0.04	0.041	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	--	<0.24	<0.24	0.55	<0.24	<0.24	<0.24
Lithium	ug/L	0.72	0.44	0.5	--	0.56	0.56	0.56	0.55	0.46	0.58	--	0.5	0.4	0.49	0.56	0.52	0.58	0.4	0.39	1	0.28	0.36	0.41
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066
Molybdenum	ug/L	<0.07	<0.07	0.073	--	0.12	<0.07	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	0.62	<0.44	<0.44	<0.44
Selenium	ug/L	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.48	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.66	0.19	<0.14	<0.14
Total Radium	pCi/L	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247	0.1	0.395	0.39	0.285	0.243	0.611	0.673
Radium-226	pCi/L	0.156	-0.088	--	-0.058	0.132	0.168	0.624	0.0768	0.27	0.242	--	0.155	-0.203	0.313	0.199	0.247	0.1	0.368	0	-0.289	0	0.254	0.267
Radium-228	pCi/L	0.437	0.0809	--	1.37	0.693	0.236	0.766	0.0161	0.406	0.267	--	0.371	0.529	0.307	0.482	-0.024	-0.153	0.0273	0.39	0.285	0.243	0.357	0.406
Field Specific Conductance	umhos/cm	599	427	574.8	579.3	1002	578.2	489	948	535.3	557.2	491	581.7	617.1	609	637.2	614.1	618.4	613.7	610.1	610.9	598.9	600.2	585.2
Oxygen, Dissolved	mg/L	9.7	9.37	3.78	5.11	9.61	8.94	6.48	9.28	9.46	7.5	9.3	3.94	8.84	10.01	9.49	11.36	8.43	9.81	9.39	9.8	9.25	9.33	8.31
Field Oxidation Potential	mV	154	165.1	139.9	138.3	82.7	87	192.9	102	123.6	204.7	210	53.3	142.7	71.5	103.4	181.7	121.5	135	153.2	95.6	89.7	200.6	39.9
Groundwater Elevation	feet	785.31	786.3	785.89	785.61	787.22	786.63	786.7	787.16	787.63	786.68	785.32	785.88	786.55	788.32	787.35	787.79	786.5	787.02	786.1	785.84	784.96	785.02	784.57
Temperature	deg C	10.4	10.2	11.3	11	11.5	10.8	10.9	10.6	11.3	11.2	11.1	10.2	12	11.6	10.2	11.8	10.3	10.6	11.9	10.2	12.5	9.9	11.7
Turbidity	NTU	--	0.86	2.75	0.17	0.3	0.25	0.33	0.04	0.56	0.08	2.93	0.81	0.71	3.79	1.9	2.41	1.23	2.15	0	2.45	3.41	0	0
pH at 25 Degrees C	Std. Units	7.5	7.4	7.4	--	7.3	7.4	7.3	7.7	7.6	7.4	7.6	7.6	7.4	7.5	7.4	7.5	7.4	7.6	7.6	7.6	7.8	7.6	7.4

Single Location

Name: WPL - Columbia

Location ID: MW-301
Number of Sampling Dates: 22

Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022
Boron	ug/L	26.5	25.2	23.6	30.6	32.8	32.6	28.8	21.3	30.6	34.3	24.3	22.8	27.8	26.9	35.9	27.9	21.3	28.8	22.2	31.4	28.7	37.5
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000	93000	117000	67800	97300	62800
Chloride	mg/L	3.7	4	3.5	2.2	2	1.5	2	3.5	5.5	4	2.3	5.2	3.2	0.79	1.7	1.3	2	3.4	1.5	2.7	1.9	2.3
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	6.85	7.01	6.87	7.28	6.63	7.1	7.11	6.7	6.75	7.37	6.76	6.91	6.79	6.62	6.67	6.89	6.73	6.95	6.66	7.01	6.6	6.8
Sulfate	mg/L	9.3	15.3	15	13.9	12.3	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5	25.1	8.5	17.4	12.7	11.6
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452	412	472	334	422	282
Antimony	ug/L	0.15	0.094	0.13	<0.073	0.4	<0.073	<0.073	<0.15	<0.15	--	<0.15	0.36	<0.15	0.32	<0.15	--	<0.15	0.33	<0.15	<0.15	0.31	<0.15
Arsenic	ug/L	0.26	0.26	0.19	0.24	0.4	0.13	0.18	<0.28	<0.28	--	<0.28	0.45	<0.28	0.4	0.42	<0.28	0.33	0.62	<0.28	0.35	0.47	0.3
Barium	ug/L	20.2	11.1	11.6	15.6	15	13.5	13.2	11.3	11.8	--	9.3	10.2	11.5	11.8	10	10.9	9.8	9.4	8.9	7.7	7.8	7.5
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.19	<0.13	<0.13	<0.18	<0.18	--	<0.18	0.37	<0.18	0.28	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	0.32	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	0.21	<0.15	--	<0.15	0.19	<0.15	<0.15	0.3	<0.15
Chromium	ug/L	2.1	0.58	0.59	<0.39	0.7	0.53	0.7	2.3	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	1.4	0.25	0.22	0.041	0.38	0.071	0.064	0.13	0.12	--	<0.085	0.28	<0.12	0.35	<0.12	0.17	<0.12	0.29	<0.12	0.34	0.32	0.52
Lead	ug/L	0.9	0.077	0.48	<0.04	0.34	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	0.3	<0.24	--	<0.24	0.25	<0.24	<0.24	3.1	<0.24
Lithium	ug/L	1.3	0.58	0.69	0.6	0.87	0.67	0.68	0.62	0.6	--	0.55	0.85	0.52	0.9	0.61	0.67	0.47	0.46	0.58	0.46	0.56	0.37
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066
Molybdenum	ug/L	0.35	0.15	0.14	0.12	0.38	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	0.3	0.21	0.39	<0.21	0.26	<0.21	<0.21	<0.32	<0.32	--	<0.32	0.71	<0.32	0.49	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.48	<0.14	<0.14	<0.14	<0.14	--	<0.14	0.3	<0.14	0.48	<0.14	<0.14	<0.14	0.3	<0.14	0.17	0.32	<0.14
Total Radium	pCi/L	1.31	1.11	0.89	0.631	1.01	2.42	1.35	1.3	1.74	--	0.882	0.0351	0.652	0.552	0.701	0.502	0.193	0.38	1.16	0.172	0.179	0.00292
Radium-226	pCi/L	0.655	0.294	0.404	-0.067	0.108	1.46	0.513	0.287	1.09	--	0.122	-0.06	0.247	0	0.252	0.136	0	0.0511	0.418	0.172	0	-0.169
Radium-228	pCi/L	0.651	0.82	0.486	0.631	0.905	0.964	0.833	1.01	0.647	--	0.76	0.0351	0.405	0.552	0.449	0.366	0.193	0.329	0.739	-0.0327	0.179	0.00292
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797	760	857	597.2	747	507.5
Oxygen, Dissolved	mg/L	1.7	2.71	1.47	1.99	1.34	1.24	1.44	1.81	1.43	1.1	2.35	2.14	2.49	2.2	1.67	1.07	2	1.22	3.9	0.25	2.47	0.1
Field Oxidation Potential	mV	135	123.7	133.9	100.8	95.8	226.1	100.9	115.1	187.4	204	74.3	126.5	77.9	152.1	173	132.3	118.7	183.9	102.9	57.8	207.5	80.9
Groundwater Elevation	feet	785.56	768.12	786.31	787.64	787.37	787.27	787.89	788.25	787.34	785.89	785.29	787.06	788.98	787.04	788.47	787.24	787.77	786.53	786.5	785.28	785.44	784.91
Temperature	deg C	9.7	7.7	10	11.2	10.1	8.8	7.7	8.9	10.2	11.1	7.4	10.6	11.1	7.5	11.3	8.5	8.1	11	7.4	11.1	7.1	10.8
Turbidity	NTU	--	1.52	3.89	0.59	0.74	0.42	0.1	0.22	0.18	1.52	1.12	0.46	3.3	2.02	2.12	1.41	0	0	2.41	3.21	0	0
pH at 25 Degrees C	Std. Units	7	7	6.8	6.8	6.9	6.9	7.1	7	7	7.3	7	7	7.1	6.8	7	6.8	7	7.2	6.9	7.3	7	7.1

Single Location

Name: WPL - Columbia

Location ID: MW-306
Number of Sampling Dates: 17

Parameter Name	Units	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/8/2019	12/13/2019	2/3/2020	5/28/2020	10/7/2020	4/12/2021	10/12/2021	4/12/2022	10/26/2022
Boron	ug/L	138	128	129	136	145	92	166	119	134	121	120	108	108	101	114	114	--
Calcium	ug/L	81200	83500	85200	84800	90700	78400	86700	87300	92800	83800	81900	84600	77900	80400	77000	77600	--
Chloride	mg/L	1.7	1.1	2.3	1.7	1	1.8	1.3	1.7	0.64	0.76	0.88	0.76	0.63	0.71	0.98	0.82	--
Fluoride	mg/L	0.15	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.095	--	<0.095	<0.095	<0.095	<0.095	<0.095	--
Field pH	Std. Units	8.98	7.56	7.22	6.96	7.7	7.25	7.09	7.31	7.28	7.29	7.08	6.97	7.25	7.22	7.4	7.06	--
Sulfate	mg/L	8.2	6.8	10.1	7.3	8.7	6.3	14.4	9.2	7.8	7.6	7.2	6.9	8.4	7.2	8.5	9.4	--
Total Dissolved Solids	mg/L	310	326	324	338	310	314	322	310	328	326	310	306	322	310	282	318	--
Antimony	ug/L	0.074	0.21	<0.15	<0.15	0.17	<0.15	<0.15	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	--
Arsenic	ug/L	0.14	0.25	<0.28	<0.28	0.29	<0.28	<0.28	--	--	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	<0.28	--
Barium	ug/L	19.2	14.9	8.2	11.8	16.1	11.3	8.5	--	--	9	10.2	9.7	10.5	11	11.5	10.4	--
Beryllium	ug/L	<0.13	0.14	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.25	--	<0.25	--	<0.25	<0.25	<0.25	--
Cadmium	ug/L	<0.089	0.11	<0.081	<0.081	<0.081	<0.081	<0.15	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	--
Chromium	ug/L	1.6	2.2	1.8	2	2.9	2.2	1.7	--	--	4.1	2.1	2.1	2	2.7	2.8	3.4	--
Cobalt	ug/L	0.054	0.15	<0.085	<0.085	0.2	<0.085	<0.12	--	--	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	--
Lead	ug/L	<0.04	0.15	<0.2	<0.2	<0.2	<0.2	0.26	--	--	<0.24	--	<0.24	--	<0.24	<0.24	<0.24	--
Lithium	ug/L	13.9	6.8	1.6	5.7	8.6	3.8	0.51	--	--	2.2	3.1	2.7	4.4	7.2	9.2	7.8	--
Mercury	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	--	--	<0.084	--	<0.084	--	<0.066	<0.066	<0.066	--
Molybdenum	ug/L	11.4	8.4	5	6.7	9.6	7.2	4	--	--	5.8	6.1	6.5	7.1	8.3	9.7	8.7	--
Selenium	ug/L	0.52	0.77	0.48	0.58	0.84	0.58	0.59	--	--	0.54	0.81	0.85	0.69	0.87	1	0.7	--
Thallium	ug/L	<0.14	0.28	<0.14	<0.14	<0.14	<0.14	<0.14	--	--	0.17	<0.14	<0.14	--	<0.14	<0.14	<0.14	--
Total Radium	pCi/L	0.653	0.886	1.4	0.435	0.502	0.5	0.291	--	--	0.323	0.759	0.49	0.721	0.18	0.784	0.45	--
Radium-226	pCi/L	-0.148	0.567	0.329	0.0606	0.271	0.31	0.291	--	--	0	-0.0492	0.182	0.304	0.13	0.399	0.0716	--
Radium-228	pCi/L	0.653	0.319	1.07	0.374	0.231	0.19	-0.378	--	--	0.323	0.759	0.308	0.417	0.0499	0.385	0.378	--
Field Specific Conductance	umhos/cm	531.8	899	495.7	524.4	477	583	598	592.3	583	662	588	572.1	565.4	552.4	543.1	548.1	--
Oxygen, Dissolved	mg/L	5.91	7.81	9.6	6.27	5	8.91	8.02	8.46	9.8	8.34	8.26	9.08	7.71	8.91	7.97	8.62	--
Field Oxidation Potential	mV	-16.1	97.6	84.3	196.2	234	92.8	40.3	150	109.1	56	226.5	227.7	103.8	116.7	90.9	201.9	--
Groundwater Elevation	feet	785.5	786.22	786.85	785.69	783.97	785.79	787.66	786.72	787.47	787.03	785.77	785.77	785.39	784.32	782.93	783.11	778.32
Temperature	deg C	10.1	9.8	10	12.1	13.4	9.6	13.5	9.1	13.1	11.6	9.9	10.2	13.1	9.7	12.7	8.6	--
Turbidity	NTU	0.41	0.34	0.55	0.34	32.64	3.96	4.89	1.61	1.27	0	0.65	0.32	1.29	5.52	0.51	0.42	--
pH at 25 Degrees C	Std. Units	7.5	7.4	7.4	7.3	7.4	7.4	7.5	7.4	7.3	7.3	7.4	7.6	7.6	7.5	7.7	7.4	--

Single Location

Name: WPL - Columbia

Location ID: MW-307
Number of Sampling Dates: 17

Parameter Name	Units	1/26/2017	4/10/2017	6/5/2017	8/8/2017	10/23/2017	5/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/8/2020	4/12/2021	10/12/2021	4/12/2022	10/26/2022
Boron	ug/L	319	175	178	373	434	313	338	154	242	281	246	231	307	201	327	318	--
Calcium	ug/L	70300	68300	70600	72500	83700	107000	17400	76500	75800	78700	72600	77800	67800	61900	74600	103000	--
Chloride	mg/L	8.7	4.1	5.4	8.3	12.9	52.8	19.3	13.8	9.3	16	13.8	12.9	12.1	7	9.8	10.2	--
Fluoride	mg/L	<0.5	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.48	--	<0.095	<0.48	<0.48	<0.48	<0.48	--
Field pH	Std. Units	6.89	7.52	7.26	6.9	7.75	6.83	6.94	7.14	7.24	7.18	7.19	7.07	7.28	7.32	7.11	6.85	--
Sulfate	mg/L	14.2	33.1	32.6	6.7	10.7	115	47.7	38.2	27.8	15.5	15.3	13.2	10.3	16.9	92.9	141	--
Total Dissolved Solids	mg/L	318	324	324	350	362	576	398	350	336	354	340	356	334	312	388	528	--
Antimony	ug/L	<0.073	0.29	<0.15	<0.15	<0.15	0.39	<0.15	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	--
Arsenic	ug/L	2	0.73	0.42	1.5	3	0.7	<0.28	--	--	1.1	1.7	0.76	2.7	2	1.8	2.7	--
Barium	ug/L	10.7	9.3	7.8	13.7	15.1	13.6	4.8	--	--	15.9	13.5	13.7	13.8	7.8	13.1	19	--
Beryllium	ug/L	<0.13	<0.13	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.25	--	<0.25	--	<0.25	<0.25	<0.25	--
Cadmium	ug/L	<0.089	0.27	<0.081	<0.081	<0.081	<0.081	0.21	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	--
Chromium	ug/L	<0.39	1.6	<1	<1	<1	<1	<1	--	--	<1	<1	<1	<1	<1	<1	<1	--
Cobalt	ug/L	0.33	0.58	0.19	0.6	0.43	2.7	0.45	--	--	0.46	1	0.55	0.61	0.26	0.68	1	--
Lead	ug/L	<0.04	0.41	<0.2	0.21	<0.2	<0.2	0.33	--	--	<0.24	--	<0.24	--	<0.24	<0.24	<0.24	--
Lithium	ug/L	<0.11	0.3	<0.14	0.21	<0.14	0.2	0.5	--	--	0.24	0.53	<0.22	<0.22	<0.22	<0.22	<0.22	--
Mercury	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	--	--	<0.084	--	<0.084	--	<0.066	<0.066	<0.066	--
Molybdenum	ug/L	1	0.8	0.44	0.74	1.5	0.94	<0.44	--	--	0.72	1.2	0.7	0.64	0.83	0.91	0.61	--
Selenium	ug/L	<0.21	0.4	<0.32	<0.32	<0.32	<0.32	<0.32	--	--	<0.32	0.78	<0.32	<0.32	<0.32	<0.32	<0.32	--
Thallium	ug/L	<0.14	0.37	<0.14	<0.14	<0.14	<0.14	<0.14	--	--	0.21	0.65	<0.14	--	<0.14	<0.14	<0.14	--
Total Radium	pCi/L	0.864	1.39	2.26	0.676	0.742	0.505	0.416	--	--	0.188	0.706	0.309	0.636	0.241	0.842	0.35	--
Radium-226	pCi/L	-0.523	0.233	0.914	0.309	0.511	0.309	0.251	--	--	-0.0613	-0.228	0.203	0.108	-0.179	0.154	0.0634	--
Radium-228	pCi/L	0.864	1.16	1.35	0.367	0.231	0.196	0.165	--	--	0.188	0.706	0.106	0.528	0.241	0.688	0.287	--
Field Specific Conductance	umhos/cm	570.2	898	503.9	589.9	591	915	731	662.5	618.2	752	638.3	615.2	644	575.7	709	832	--
Oxygen, Dissolved	mg/L	0.23	0.28	0.19	0.14	0.3	0.2	0.07	0.12	0.11	0.33	0.07	0.13	0.03	0.17	--	2.59	--
Field Oxidation Potential	mV	-119.6	-19.6	-12.9	-51.1	101	-34	-68.2	-0.8	-98.7	-102.7	-80.5	-26.3	-141.8	-120.4	-85	-80.5	--
Groundwater Elevation	feet	785.36	785.64	786.07	785.19	784.79	785.09	786.57	786.71	786.99	785.68	785.57	785.35	784.71	784.21	782.44	783.32	777.89
Temperature	deg C	10.1	9.2	10.5	15	14.5	9.5	14.6	8.2	14.3	12	10	10.8	14	9.4	14.2	9.7	--
Turbidity	NTU	1.9	1.28	1.85	1.78	3.87	6.64	6.07	2.27	1.83	0	1.32	0.74	0	2.83	2.18	1.86	--
pH at 25 Degrees C	Std. Units	7.5	7.6	7.4	7.3	7.4	7	7.4	7.3	7.5	7.2	7.2	7.5	7.3	7.2	7.4	7	--

Single Location

Name: WPL - Columbia

Location ID: MW-308
Number of Sampling Dates: 17

Parameter Name	Units	1/26/2017	4/10/2017	6/5/2017	8/9/2017	10/23/2017	4/24/2018	10/24/2018	4/1/2019	10/7/2019	12/13/2019	2/3/2020	5/27/2020	10/7/2020	4/12/2021	10/12/2021	4/11/2022	10/25/2022
Boron	ug/L	740	614	565	644	707	584	430	587	694	647	606	476	563	463	704	503	667
Calcium	ug/L	132000	129000	140000	131000	134000	126000	144000	132000	131000	130000	124000	132000	123000	120000	115000	136000	125000
Chloride	mg/L	7.5	5.8	5.8	3.7	5.6	3.7	<2.5	1.8	1.6	2.3	1.5	1.2	1.1	0.96	3.6	0.9	1.7
Fluoride	mg/L	<0.5	<0.5	<0.5	0.11	<0.5	<0.5	<0.5	<0.1	<0.1	<0.48	--	<0.095	0.12	<0.095	<0.48	<0.095	<0.095
Field pH	Std. Units	7.38	7.56	7.09	7.25	7.51	7.1	6.78	7.39	7.48	7.25	7.29	7.1	7.09	7.25	7.11	6.93	7.15
Sulfate	mg/L	6.1	5.5	14.8	1.7	<5	<5	70.7	1.1	<1	<2.2	<2.2	2.8	0.52	<0.44	<2.2	7.3	0.55
Total Dissolved Solids	mg/L	544	526	508	546	486	512	566	484	470	504	468	510	490	470	460	502	492
Antimony	ug/L	<0.073	0.12	<0.15	<0.15	<0.15	<0.15	<0.15	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	3.4	3.5	2.3	2.6	5.1	4.9	6.8	--	--	3.5	3.6	3.1	3.7	2.8	6.3	3.3	4.5
Barium	ug/L	70.8	95.1	66.7	75	86.6	85.4	84.8	--	--	62.4	55.6	59.1	61.5	52.6	59.2	63.6	54
Beryllium	ug/L	<0.13	0.17	<0.18	<0.18	<0.18	<0.18	<0.18	--	--	<0.25	--	<0.25	--	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.081	<0.081	<0.081	<0.081	<0.15	--	--	<0.15	--	<0.15	--	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	0.97	9.3	<1	1.1	4	7.9	<1	--	--	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	0.28	1.6	0.21	0.26	0.85	1.7	1	--	--	<0.12	<0.12	<0.12	<0.12	<0.12	0.22	0.22	<0.12
Lead	ug/L	0.28	2.5	<0.2	0.37	1.2	2.5	<0.24	--	--	<0.24	--	<0.24	--	<0.24	0.24	<0.24	<0.24
Lithium	ug/L	0.28	2.2	0.18	0.26	0.96	2.1	<0.19	--	--	<0.22	0.35	<0.22	<0.22	<0.22	0.23	<0.22	<0.22
Mercury	ug/L	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	--	--	<0.084	--	<0.084	--	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	1.2	1.4	2.2	0.91	1.2	0.54	3.2	--	--	3	1.2	0.9	1.1	0.86	7.1	0.92	0.87
Selenium	ug/L	<0.21	0.72	<0.32	<0.32	0.35	0.45	<0.32	--	--	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	--	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	1.67	0.78	1.44	1.18	0.318	0.581	0.274	--	--	0.733	0.257	0.569	1.03	0.151	0.517	0.407	0.8
Radium-226	pCi/L	0	0.295	0	0.454	-0.077	0.411	0.274	--	--	0.0522	-0.053	0.249	0.21	0.0739	-0.114	-0.31	0.05
Radium-228	pCi/L	1.67	0.485	1.44	0.722	0.318	0.17	-0.042	--	--	0.681	0.257	0.32	0.815	0.0768	0.517	0.407	0.75
Field Specific Conductance	umhos/cm	920	1457	819	864	810	902	987	924	896	1051	909	897	916	864	894	942	900
Oxygen, Dissolved	mg/L	1.15	0.19	0.16	0.08	0.2	0.11	0.08	0.15	0.07	0.4	0.08	0.21	0.45	0.13	--	0.25	0.05
Field Oxidation Potential	mV	-105.4	-106.4	-76.1	-71.4	100	-184	-147.8	-137.7	-170	-154.9	-151.7	-91.5	-123.5	-136.9	-110.8	202.4	-28.3
Groundwater Elevation	feet	785.73	786.51	786.46	785.37	784.17	782.65	787.81	787.53	787.18	786.43	786.48	786.28	785.68	785.55	783.76	784.19	784.16
Temperature	deg C	11.5	9	10.6	14.9	14.6	10.5	15.1	8.9	15	12	10.4	12.1	15.5	9.8	15.8	10.5	13.5
Turbidity	NTU	14.9	113.1	9.85	16.81	38.62	133.7	9.3	3.44	6.75	0	1.52	4.44	0	1.87	11.07	2.15	1.92
pH at 25 Degrees C	Std. Units	7.4	7.4	7.2	7.3	7.3	7.2	7.3	7.4	7.4	7.2	7.3	7.3	7.4	7.4	7.4	7.2	7.2