2024 Annual Groundwater Monitoring and Corrective Action Report

Columbia Energy Center
Dry Ash Disposal Facility, Modules 4, 5, and 6
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25224067.00 | January 31, 2025

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OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Modules 4, 5, and 6
2024 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;	Detection
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;	Detection
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	October and November 2023 Sulfate: MW-309 April and June 2024 Sulfate: MW-309
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2023 and April 2024 events during 2024. Assessment monitoring not required.

Category	Rule Requirement	Site Status
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:	Not applicable – Appendix IV sampling not required
	(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	
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 – Site is in detection monitoring
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Site is in detection monitoring

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1.0 INTRODUCTION

This 2024 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 Code of Federal Regulations (CFR) 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in *italics,* followed by applicable information relative to the 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

This report covers the period of groundwater monitoring from January 1, 2024, through December 31, 2024.

The Columbia Energy Center (COL) Dry Disposal Ash Facility is an active CCR landfill and includes an existing CCR unit and three new CCR landfill units. Module 4 of the new unit became operational in 2018 and Modules 5 and 6 became active in 2021. The groundwater monitoring system for COL Mod 4-6 was certified on December 9, 2021. The additional CCR units include existing CCR unit COL Mod 1-3, CCR unit COL Mod 10-11, and new CCR unit COL Mod 12-13. The groundwater monitoring system addressed in this report is evaluating conditions at:

- COL Dry Ash Disposal Facility – Modules 4, 5, and 6 (Mod 4-6)

The system is designed to detect monitored constituents at the waste boundary of Mod 4-6 of the COL Dry Ash Disposal Facility as required by 40 CFR 257.91(d). The groundwater monitoring system consists of two upgradient and three downgradient monitoring wells (**Table 1** and **Figure 2**). Separate groundwater monitoring systems evaluate groundwater conditions for Modules 1-3, Modules 10-11, and Modules 12-13 of the COL Dry Ash Disposal Facility. Combining the landfill CCR units into two CCR units with a combined multi-unit monitoring system is planned for 2025.

2.0 BACKGROUND

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

- 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 Ash Disposal Facility Mod 4-6. 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 the Columbia Energy Center (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-309, MW-310, and MW-311, the unconsolidated materials were identified as consisting primarily of silty sand, sand, and gravels. The boring log for previously installed monitoring well MW-84A shows silty sand and sand as the primary unconsolidated materials at this location. All CCR monitoring wells are screened within the unconsolidated sand unit. Boring logs for the downgradient monitoring wells used to evaluate the COL Ash Disposal Facility Mod 4-6 CCR unit are included in **Appendix B.**

Shallow groundwater at the site generally flows to the north and west across the existing landfill area. The April 2024 water levels appear to return to a normal flow direction of southeast to northwest in the Mod 4-6 area, following temporary changes to groundwater caused by a dewatering system for pond closure activities in 2022 through 2023. The water table elevations and groundwater flow directions for the April 2024 monitoring event are shown on **Figure 3.** A supplemental groundwater elevation sampling event was completed in August 2024, with groundwater elevations and flow shown on **Figure 4.** The water table elevations and groundwater flow directions for the October 2024 monitoring event are shown on **Figure 5.** The groundwater elevation data for the CCR monitoring wells are provided in **Table 3.** Calculated 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 (**Table 1** and **Figure 2**). The background wells include MW-301 and MW-84A. The downgradient wells include MW-309, MW-310, and MW-311. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 29 to 52 feet, measured from the top of the well casing.

3.0 § 257.90(e) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For CCR management units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31, 2029, and annually thereafter. 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. 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:*

3.1 § 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 site location is provided on Figure 1. A map showing the Dry Ash Disposal Facility Mod 4-6 CCR unit 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.

3.2 § 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 Mod 4-6 of the Dry Ash Disposal Facility in 2024.

3.3 § 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;

Groundwater sampling events were completed in April, June, October, and November 2024 at COL Dry Ash Disposal Modules 4-6 as part of ongoing detection monitoring. Samples collected in June and November 2024 were collected for limited parameters at select wells during retest events for the April and October 2024 sampling events, respectively.

Groundwater samples collected during the semiannual events in April and October 2024 were analyzed for the Appendix III constituents. The retest sampling events in June and November 2024 were limited to a subset of the Appendix III constituent list for MW-309. The June retesting was performed for sulfate at MW-309, which exceeded the UPL in the April sampling event. The November retesting was also performed for sulfate, at MW-309, which exceeded the UPL in the October sampling event. 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 or assessment monitoring program is included in Table 2.

The validation and evaluation of the October and November 2023 monitoring event data was completed and transmitted to WPL on February 12, 2024. The validation and evaluation of the April and June 2024 monitoring event data was completed and transmitted to WPL on September 17, 2024. The validation and evaluation of the October 2024 monitoring event and November 2024 retest sampling event data was in progress at the end of 2024 and will be transmitted to WPL in 2025; therefore, the October and November 2024 monitoring results and analytical reports will be included in the 2025 annual report. The October and November 2024 groundwater elevation data is included in this report.

The sampling results for Appendix III parameters in October and November 2023 are summarized in **Table 5A.** The sampling results for Appendix III parameters in April and June 2024 are summarized in **Table 5B.** Field parameter results for the October 2023, November 2023, April 2024, and June 2024 sampling events are provided in **Table 6.** The analytical laboratory reports for October 2023, November 2023, April 2024, and June 2024 are provided in **Appendix C.** Historical results for each monitoring well through June 2024 are summarized in **Appendix D.**

3.4 § 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 were no transitions between monitoring programs during 2024. The COL Dry Ash Disposal Facility, Mod 4-6 remained in the detection monitoring program.

In 2024, the monitoring results for the October 2023 and April 2024 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. The comparison to background was based on a prediction limit approach, comparing the results to intrawell UPLs.

The October and November 2023 sample results were compared to the intrawell UPLs that were calculated in January 2020 using background data collected through September 2018, prior to CCR placement in Mod 4. The January 2020 statistical analysis was included as an appendix in the 2021 Annual Groundwater Monitoring Report. The April and June 2024 sample results were compared to the intrawell UPLs that were recently recalculated in September 2024 using background data collected through October 2023. The updated UPL memorandum is included in **Appendix F.**

For the October 2023 and April 2024 events, SSIs for sulfate at MW-309 were identified.

Alternative source demonstrations (ASDs) were completed for the October 2023 and April 2024 events, demonstrating that sources other than the CCR unit were the likely cause of the observed concentrations of sulfate. The ASD reports are provided in **Appendix E.**

3.5 § 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 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

3.5.1 § 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 was in detection monitoring throughout 2024.

Summary of Key Actions Completed.

- Statistical evaluation and determination of SSIs for the October 2023 and April 2024 monitoring events.
- ASD reports for the SSIs identified from the October 2023 and April 2024 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2024).
- Two resampling events at MW-309 in June and at MW-309 and MW-310 in November 2024.

Description of Any Problems Encountered. No problems were encountered for Mod 4-6 in 2024.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2025).

- Establish and certify a multi-unit monitoring system for Mod 1-3, Mod 4-6, Mod 10-11, and Mod 12-13.
- Statistical evaluation and determination of any SSIs for the October 2024 and April 2025 monitoring events, including any retesting events.
- If an SSI is determined, then within 90 days either:
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2025).

3.5.2 § 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. No alternative detection monitoring frequency has been proposed.

3.5.3 § 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.

The ASD reports prepared to address the SSIs observed for the October 2023 and April 2024 sampling events are provided in **Appendix E**. The ASD reports are certified by a qualified professional engineer.

3.5.4 § 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 not been initiated.

3.5.5 § 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).

Not applicable. Assessment monitoring has not been initiated.

3.5.6 § 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. Assessment monitoring has not been initiated.

3.5.7 § 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.

3.6 §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.

4.0 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.

U.S. Environmental Protection Agency (U.S. EPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

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.

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Tables

Table 1. Groundwater Monitoring Well Network
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25224067.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
MW-309	Downgradient	Compliance
MW-310	Downgradient	Compliance
MW-311	Downgradient	Compliance

Last revision by: NLB Date: 11/18/2024
Checked by: RM Date: 12/4/2024

Table 2. Groundwater Samples Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25224067.00

Sample Dates	Downgradient Wells			Background Wells	
	MW-309	MW-310	MW-311	MW-84A	MW-301
April 14-17, 2024	D	D	D	D	D
June 4, 2024	D-R	--	--	--	--
October 1-2, 2024	D	D	D	D	D
November 5, 2024	D-R	D-R	--	--	--
Total Samples	4	3	2	2	2

Abbreviations:
D = Detection Monitoring
D-R = Detection Monitoring Retest Sample
-- = Not Sampled

Last revision by:	RM	Date:	12/6/2024
Checked by:	BLR	Date:	12/6/2024

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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
Dry Ash Facility (Facility ID #03025)	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	778.12	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	aband	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	aband	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	aband	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
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	April 15-17, 2024	aband	aband	dry	783.02	782.94	784.14	784.11	782.95	783.41	784.90	784.84	784.54	784.61	784.57	785.19	784.75	783.88	783.87	783.59
	April 19, 2024	aband	aband	785.47	783.06	783.02	784.28	784.30	783.05	dry	785.05	785.01	784.67	784.74	784.62	785.63	785.16	783.95	783.95	783.68
	July 29, 2024	aband	aband	NM	NM	NM	787.29	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	August 15, 2024	aband	aband	789.12	788.77	787.94	787.62	787.56	788.05	788.44	788.17	788.07	788.31	788.66	788.40	789.03	788.58	788.39	788.35	788.31
	October 1-3, 2024	aband	aband	788.25	787.33	786.64	786.79	786.75	786.60	788.86	787.14	787.06	787.14	787.81	787.52	788.33	787.86	787.00	786.97	786.90
	November 5, 2024	NM	NM	NM	785.98	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	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

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
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
	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	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
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	April 15-17, 2024	781.73	781.38	782.58	782.51	782.42	782.35	781.82	782.23	782.17	781.47	783.40
	April 19, 2024	NM	dry	782.78	782.80	782.57	782.56	NM	782.35	782.29	781.65	783.48
	August 15, 2024	781.49	784.27	786.74	786.56	787.47	787.31	783.56	787.87	786.90	783.38	783.95
	October 1-3, 2024	779.13	783.42	785.25	785.12	785.99	785.86	782.99	785.86	785.19	782.26	783.50
	October 4, 2024	--	783.57	--	--	--	--	--	--	--	--	--
	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

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

CCR Rule Wells	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	818.88	820.37	828.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	784.6	787.4	790.7
	Measurement Date																								
	December 21-22, 2015	785.56	784.78	784.11	786.13	NI	788.96	787.58	783.77	783.50	785.31	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
	April 4-5, 2016	786.78	785.81	785.48	788.08	NI	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 7-8, 2016	786.31	786.28	784.60	787.36	NI	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	July 28, 2016	NM	NM	784.35	NM	NI	NM	NM	NM	784.86	785.61	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-13, 2016	787.64	787.76	786.18	788.18	NI	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 29, 2016	787.37	787.05	NM	NM	NI	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	January 25-26, 2017	787.27	786.89	785.28	789.34	NI	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	NI	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	June 6, 2017	788.25	788.37	786.49	788.58	NI	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	August 7-9, 2017	787.34	787.55	785.42	789.52	NI	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	October 23-24, 2017	785.89	785.94	783.92	788.97	NI	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 21, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI	NI	NI	NI
	March 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI	NI	NI	NI
	April 23-25, 2018	785.29	784.37	783.27	789.69	NI	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83	NI	NI	NI	NI	NI	NI	NI	NI
	May 24, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI	NI	NI	NI
	June 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI	NI	NI	NI
	July 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI	NI	NI	NI
	August 7, 2018	787.06	NM	785.20	788.25	NI	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 22, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI	NI	NI	NI
	September 21, 2018	NM	788.37	786.50	NM	NI	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66	NI	NI	NI	NI	NI	NI	NI	NI
	October 22-24, 2018	788.98	789.16	787.51	789.05	NI	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64	NI	NI	NI	NI	NI	NI	NI	NI
	April 1-4, 2019	787.04	787.56	786.52	789.72	NI	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38	NI	NI	NI	NI	NI	NI	NI	NI
	June 12, 2019	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI	NI	NI	NI
	June 19, 2019	NM	NM	786.81	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-9, 2019	788.47	788.31	787.02	790.41	NI	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI	NI	NI	NI
	December 13, 2019	--	--	--	--	NI	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	NI	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI	NI	NI	NI
	January 17, 2020	--	--	785.58	--	NI	--	--	--	--	--	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
	February 3, 2020	787.24	NM	NM	NM	NI	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	May 27-29, 2020	787.77	787.29	785.56	789.30	NI	787.78	787.73	786.01	785.98	787.02	785.77	785.35	786.28	785.98	785.81	785.85	NI	NI	NI	NI	NI	NI	NI	NI
	June 30, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	August 6, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 7-8, 2020	786.53	786.74	785.16	788.52	NI	787.96	787.74	785.91	785.70	786.10	785.39	784.71	785.68	785.47	785.56	785.83	NI	NI	NI	NI	NI	NI	NI	NI
	December 11, 2020	NM	NM	NM	NM	NI	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 25, 2021	NM	NM	784.27	NM	NI	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 12, 2021	786.50	785.77	784.07	787.99	NI	788.11	786.34	784.27	784.77	785.84	784.32	784.21	785.55	784.29	784.24	784.15	NI	NI	NI	NI	NI	NI	NI	NI
	June 11, 2021	NM	NM	NM	NM	NI	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI	NI	NI	NI
	July 20, 2021	NM	NM	783.64	NM	NI	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	NI	787.75	786.33	783.73	784.42	784.96	782.93	782.44	783.76	783.65	783.48	783.48	NI	NI	NI	NI	NI	NI	NI	NI
	December 21, 2021	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	February 24, 2022	NM	NM	782.34	NM	NI	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	April 11-13, 2022	785.44	784.42	783.40	788.20	NI	787.87	788.26	783.27	784.30	785.02	783.11	783.32	784.19	783.14	783.19	783.04	NI	NI	NI	NI	NI	NI	NI	NI
	July 27, 2022	NM	NM	783.07	NM	NI	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
	October 25-27, 2022	784.91	784.62	778.94	781.79	NI	784.97	783.85	781.94	783.61	784.57	778.32	777.89	784.16	781.50	780.96	781.23	NI	NI	NI	NI	NI	NI	NI	NI
	November 30, 2022	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI	NI	NI	NI
	December 2, 2022	785.12	784.48	NM	783.97	NI	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	818.88	820.37	828.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	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	30.73	25.6	39.58	31.08	35.43	40.21	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	784.6	787.4	790.7
	Measurement Date																								
	January 12-13, 2023	785.20	784.55	NM	NM	NI	NM	NM	782.75	784.10	784.88	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI	NI	NI	NI
	January 20, 2023	NM	NM	NM	788.08	NI	NM	NM	NM	NM	NM	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI
	January 24, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI	NI	NI	NI
	February 20-23, 2023	785.56	784.98	NM	NM	NI	NM	NM	NM	NM	NM	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI	NI	NI	NI
	March 27-28, 2023	786.83	785.87	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI	NI	NI	NI
	April 24-27, 2023	787.57	786.87	784.38	784.03	NI	NM	782.59	785.79	786.22	786.97	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI	NI	NI	NI
	May 5, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49	NI	NI	NI
	May 16, 2023	787.43	787.07	783.88	784.12	NI	dry	781.64	785.64	786.06	786.88	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48	NI	NI	NI
	May 30-31, 2023	787.04	786.89	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM	NI	NI	NI
	June 29-30, 2023	786.32	786.39	NM	NM	NI	NM	NM	784.32	785.04	785.92	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM	NI	NI	NI
	July 31, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM	NI	NI	NI
	August 31, 2023	NM	785.30	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM	NI	NI	NI
	October 9-11, 2023	784.67	784.65	781.21	780.09	NI	779.93	780.54	782.57	783.55	784.39	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30	NI	NI	NI
	November 9, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	782.76	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
CCR Rule Wells (cont.)	November 20, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	781.97	781.45	782.85	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	December 27, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.18	783.36	NM	NI	NI	NI
	April 15-17, 2024	785.27	784.49	782.16	aband	782.17	780.80	781.38	783.02	784.14	784.90	782.40	782.24	784.51	782.79	782.68	782.64	783.59	783.16	783.42	783.53	782.09	783.12	783.05	785.27
	April 19, 2024	785.51	784.55	782.26	aband	782.23	dry	dry	783.06	784.28	785.05	NM	782.64	784.69	782.90	782.82	782.74	783.68	783.30	783.49	783.62	782.15	NM	NM	NM
	May 20, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.25	NM	NM	NM	NM
	June 4, 2024	NM	NM	NM	aband	NM	783.03	783.66	NM	NM	NM	NM	NM	NM	784.27	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	June 27, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.87	785.97	787.20
	July 31, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.95	788.83	789.56
	August 8, 2024	NM	NM	787.17	aband	786.34	783.77	784.45	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.24	NM	NM	NM
	August 15, 2024	788.75	789.53	786.93	aband	786.03	783.75	784.27	788.77	787.62	788.17	787.66	787.24	788.39	787.90	787.93	788.37	788.31	aband	aband	aband	785.99	787.87	788.63	789.68
	August 30, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	aband	aband	aband	NM	787.28	787.78	789.17
	October 1-3, 2024	787.92	788.35	785.30	aband	784.91	782.80	783.42	787.33	786.79	787.14	786.04	785.94	786.88	786.46	786.35	786.40	786.90	aband	aband	aband	784.80	786.41	786.71	788.22
	October 18, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	785.50	785.08	786.34	NM	NM	NM	NM	aband	aband	aband	NM	NM	NM	NM
	October 31, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	aband	aband	aband	NM	785.73	785.92	787.88
	November 5, 2024	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.45	NM	NM	NM	NM	NM	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	773.61	780.72	766.52	777.21	770.52	774.07	780.63	780.39	778.90	775.60	775.21	773.55	774.29	774.10	776.61	774.18	764.79	774.58	777.37	780.68

Notes:
NM = not measured
NI = not installed
aband = abandoned
dry = well was dry at time of meaurement
(1) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5, 2017 sampling event. The level was allowed to return to static and was measured on October 10, 2017.
(2) 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'.

Last revision by: EMS Date: 11/5/2024
Checked by: RM Date: 11/8/2024

Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25224067.00
January - December 2024

	Flow Path A - Northwest				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/15-17/2024	784.00	782.68	1089	0.0012	0.003
8/15/2024	789.00	788	1087	0.0009	0.002
10/1-3/2024	788.00	786.46	1266	0.0012	0.003

Wells	K Values (cm/sec)	K Values (ft/d)
MW-309	2.12E-04	0.60
MW-310	1.91E-04	0.54
MW-311	6.12E-04	1.73
Geometric Mean	2.92E-04	0.83

Assumed Porosity, n
0.40

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

ft = feet
ft/d = feet per day
cm/sec = centimeters per second
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 = difference in elevation between locations 1 and 2
Δh/Δl = hydraulic gradient

Notes:
1. See Figures 3 and 4 for velocity calculation flow path locations.

Last revision by: NLB Date: 12/18/2024
Checked by: LH Date: 12/20/2024

Table 5A. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Module 4-6 / SCS Engineers Project #25223067.00

	Background Wells		Compliance Wells						
Parameter Name	**MW-84A**	**MW-301**	**MW-309**			**MW-310**		**MW-311**	
	10/11/2023	10/11/2023	**Intrawell UPL**	10/9/2023	11/7/2023	**Intrawell UPL**	10/9/2023	**Intrawell UPL**	10/9/2023
Groundwater Elevation, ft amsl	784.39	784.67		782.58	782.76		782.32		782.22
Appendix III									
Boron, µg/L	14.0	36.2	42.2	41.5	--	81.9	65.6	49.8	31.0
Calcium, µg/L	65,100	52,300	99,900	66,800	--	56,000	37,500	84,200	60,900
Chloride, mg/L	3.1	2.1	901	259	--	205	71.3	4.41	2.0 J
Fluoride, mg/L	<0.095	<0.095 M0	DQ	<0.095	--	DQ	<0.095 M	DQ	<0.095 M0
Field pH, Std. Units	7.51	7.06	8.18	7.43	7.25	8.12	7.70	8.07	7.46
Sulfate, mg/L	1.4 J	11.8	53.1	80.6	89.0	118	90.7	131	10.8
Total Dissolved Solids, mg/L	324	300	1,730	858	--	759	554	462	270

4.4 — Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
DQ = Double Quantification
-- = Not Analyzed
Std. Units = Standard Units
LOQ = Limit of Quantitation
LOD = Limit of Detection
ft amsl = feet above mean sea level
mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Notes:
1. Intrawell UPLs are based on 1-of-2 retesting approach; therefore, there is no SSI if either the original sample result or the resample are below the UPL.
2. Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.
3. Intrawell UPLs were calculated from background sampling results for the compliance wells from February 2018 through September 2018.

Last revision by: RM   Date: 11/7/2023
Checked by: NLB   Date: 11/14/2023

Table 5B. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Module 4-6 / SCS Engineers Project #25224067.00

	Background Wells		Compliance Wells						
Parameter Name	**MW-84A**	**MW-301**	**MW-309**			**MW-310**		**MW-311**	
	4/17/2024	4/17/2024	**Intrawell UPL**	4/15/2024	6/4/2024	**Intrawell UPL**	4/15/2024	**Intrawell UPL**	4/15/2024
Groundwater Elevation, ft amsl	784.90	785.27		782.79	784.27		782.68		782.64
Appendix III									
Boron, µg/L	11.9	24.9	61.9	38.7	--	82.4	65.2	43.1	30.9
Calcium, µg/L	73,700	102,000	137,000	82,600	--	65,700	44,600	76,300	59,900
Chloride, mg/L	3.2	1.6 J	772	391	--	277	175	3.67	2.3
Fluoride, mg/L	0.12 J	<0.095	DQ	<0.095	--	DQ	<0.095	DQ	<0.095
Field pH, Std. Units	7.68	7.06	7.94	7.27	7.55	8.02	7.63	7.95	7.40
Sulfate, mg/L	1.4 J	11.5	64.6	75.1	68.8	107	98.9	124	10.1
Total Dissolved Solids, mg/L	322	458	1,600	948	--	773	686	380	276

4.4 — Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
DQ = Double Quantification
-- = Not Analyzed
ft amsl = feet above mean sea level
LOQ = Limit of Quantitation
LOD = Limit of Detection
Std. Units = standard units
mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.

Notes:
1. Intrawell UPLs are based on 1-of-2 retesting approach; therefore, there is no SSI if either the original sample result or the resample are below the UPL.
2. Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.
3. Intrawell UPLs were calculated from background sampling results for the compliance wells from February 2018 through October 2023.

Last revision by: RM Date: 6/24/2024
Checked by: BLR Date: 6/28/2024

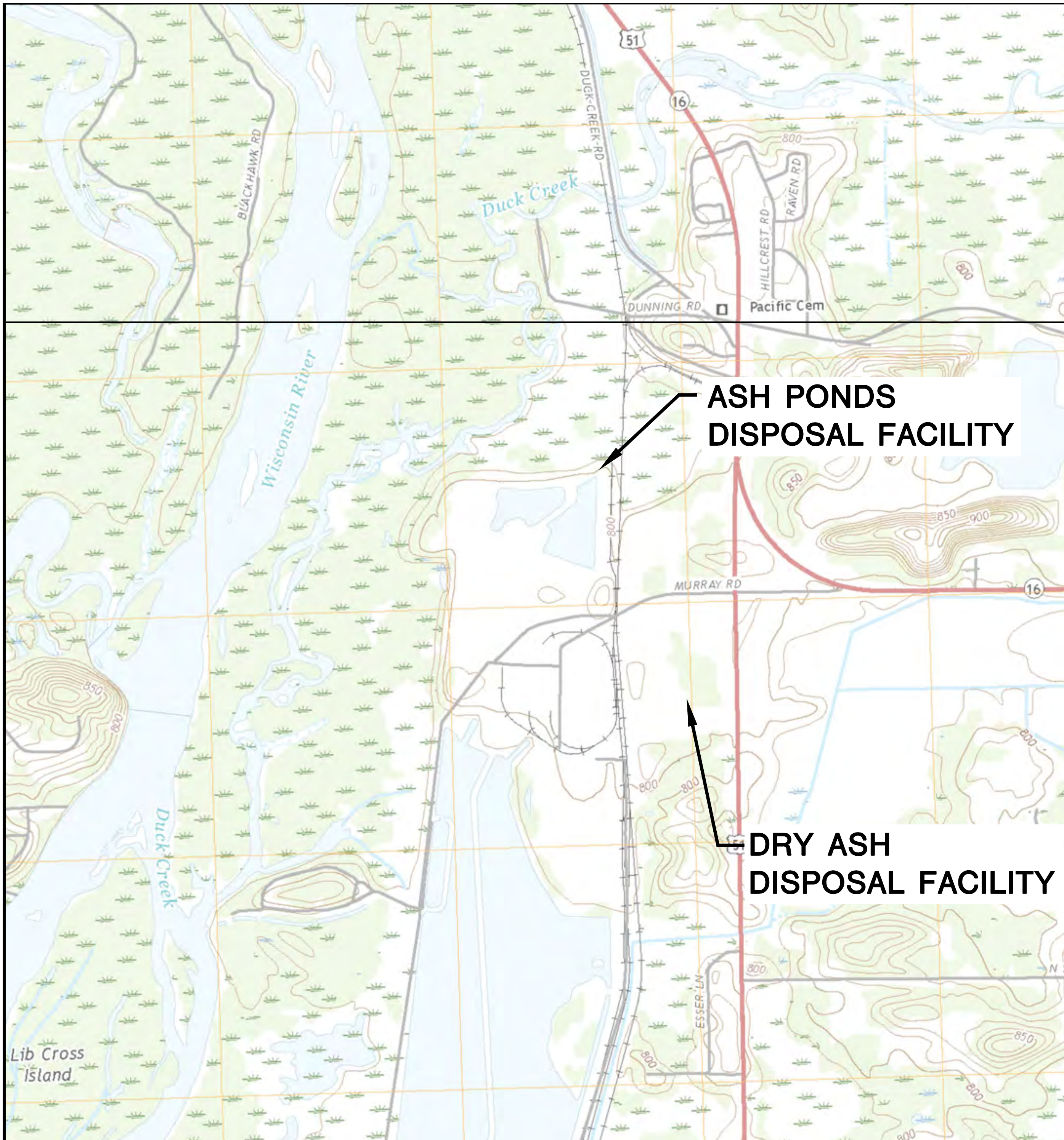
Table 6. Groundwater Field Data Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6 / SCS Engineers Project #25224067.00

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	10/11/2023	784.39	12.3	7.51	8.44	599.9	91.2	0.03
	4/17/2024	784.90	11.0	7.68	7.82	588.1	0.0	0.00
MW-301	10/11/2023	784.67	10.7	7.06	0.16	536.0	23.8	0.34
	4/17/2024	785.27	8.6	7.06	2.53	781.0	17.9	0.00
MW-309	10/9/2023	782.58	12.5	7.43	9.90	1553	87.2	9.11
	11/9/2023	782.76	13.5	7.25	7.45	1330	169.0	1.60
	4/15/2024	782.79	12.5	7.27	8.91	1620	46.1	4.93
	6/4/2024	784.27	14.3	7.55	9.20	2328	121.6	0.99
MW-310	10/9/2023	782.32	13.1	7.70	10.05	949	106.6	2.32
	4/15/2024	782.68	12.2	7.63	8.83	1170	50.8	0.00
MW-311	10/9/2023	782.22	12.3	7.46	10.48	493.4	-101.8	0.31
	4/15/2024	782.64	11.3	7.40	9.42	460.8	51.5	0.00

Notes/Abbreviations:
deg C = degrees Celsius
Std. Units = standard units
mg/L = milligram per liter
umhos/cm = micromhos per centimeter
mV = millivolts
NTU - nephelometric turbidity unit

Last revision by: RM Date: 12/4/2024
Checked by: BLR Date: 12/6/2024

Figures



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

CLIENT	SITE	
ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI	SITE LOCATION MAP

				ENGINEER	FIGURE
PROJECT NO.	25219067.00	DRAWN BY:	BSS	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	1
DRAWN:	12/02/2019	CHECKED BY:	MDB		
REVISED:	01/10/2020	APPROVED BY:	TK 01/30/2020		

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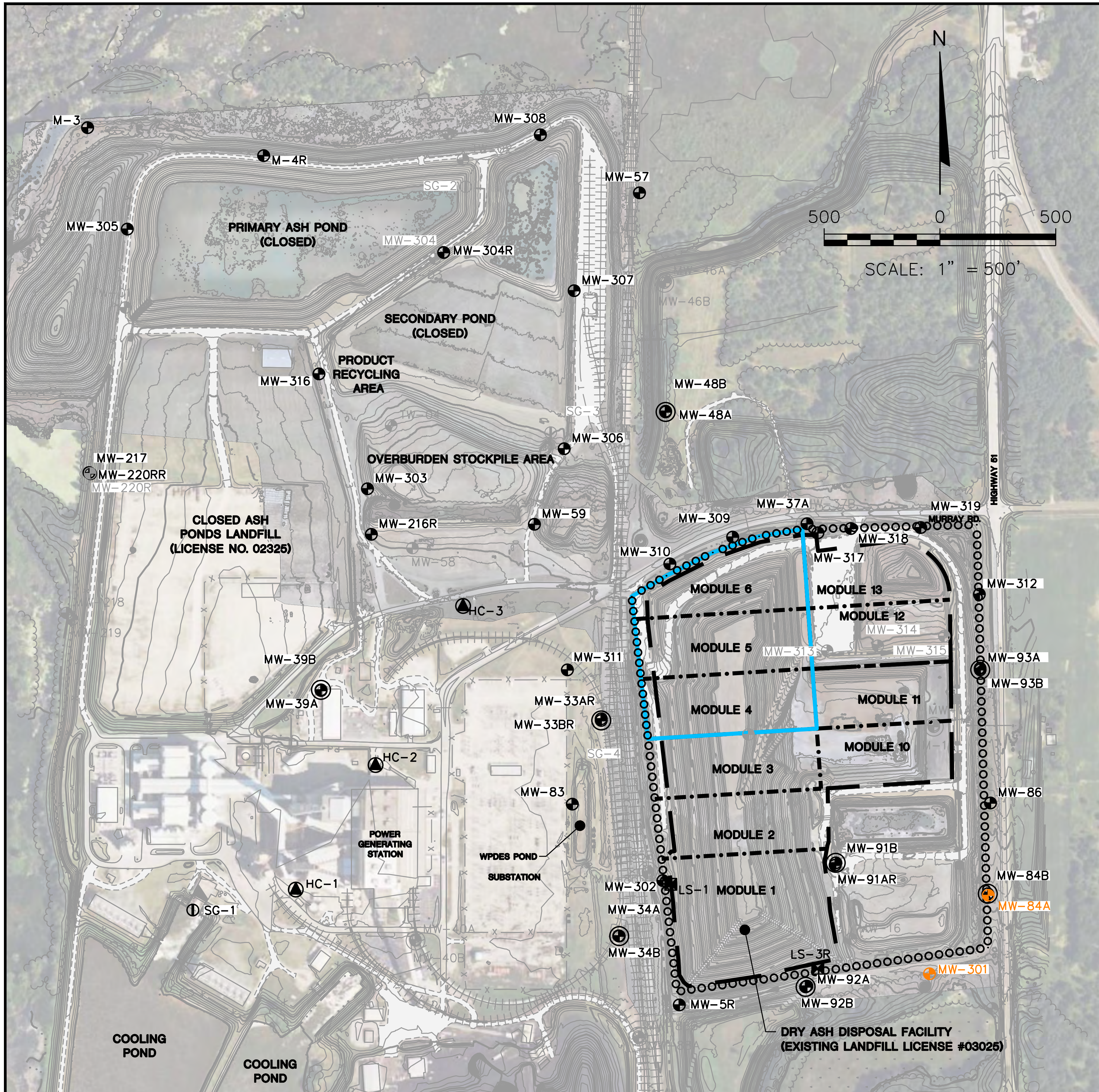

LEGEND

- 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
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED STAFF GUAGE
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, PERIODIC SURVEYS BY SCS ENGINEERS AND CEDAR CREEK SURVEYING, LLC, AND DECEMBER 2023 DRONE SURVEY BY AMES.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. MONITORING WELLS MW-317, MW-318, AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 9 THROUGH 11, 2024. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE ABANDONED BY HORIZON CONSTRUCTION & EXPLORATION ON MAY 22, 2024.
10. BACKGROUND MONITORING WELLS ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB	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 PARDEEVILLE, WI	SITE PLAN AND MONITORING WELL LOCATIONS COLUMBIA DRY ASH DISPOSAL FACILITY	FIGURE 2
DRAWN:	01/03/2025	CHECKED BY:	NLB								
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)								

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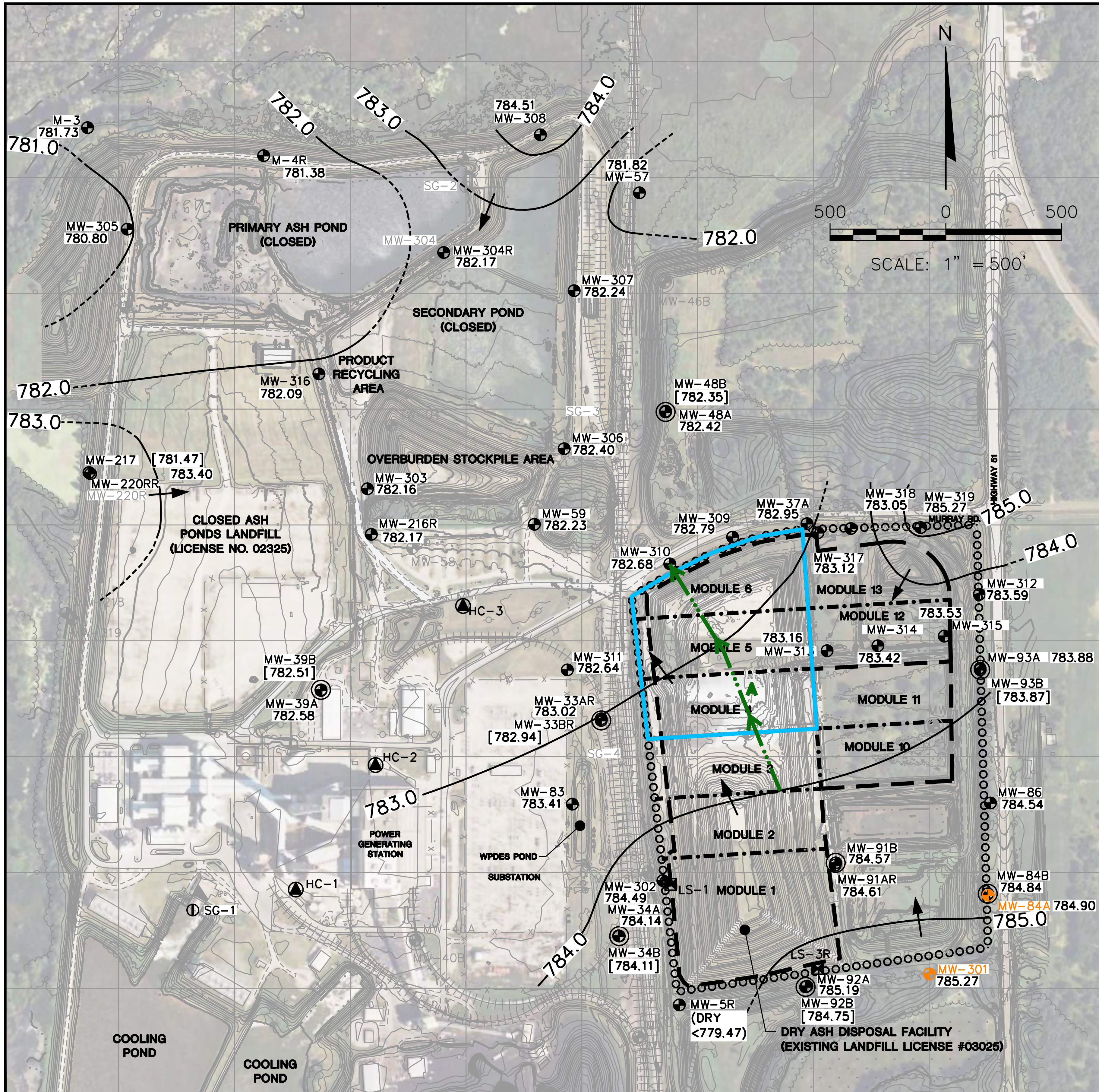

LEGEND

- 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
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 783.88 WATER TABLE ELEVATION
- [781.47] POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (DRY) SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
10. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024.
11. BACKGROUND MONITORING WELLS ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
APRIL 15-17, 2024

FIGURE
3

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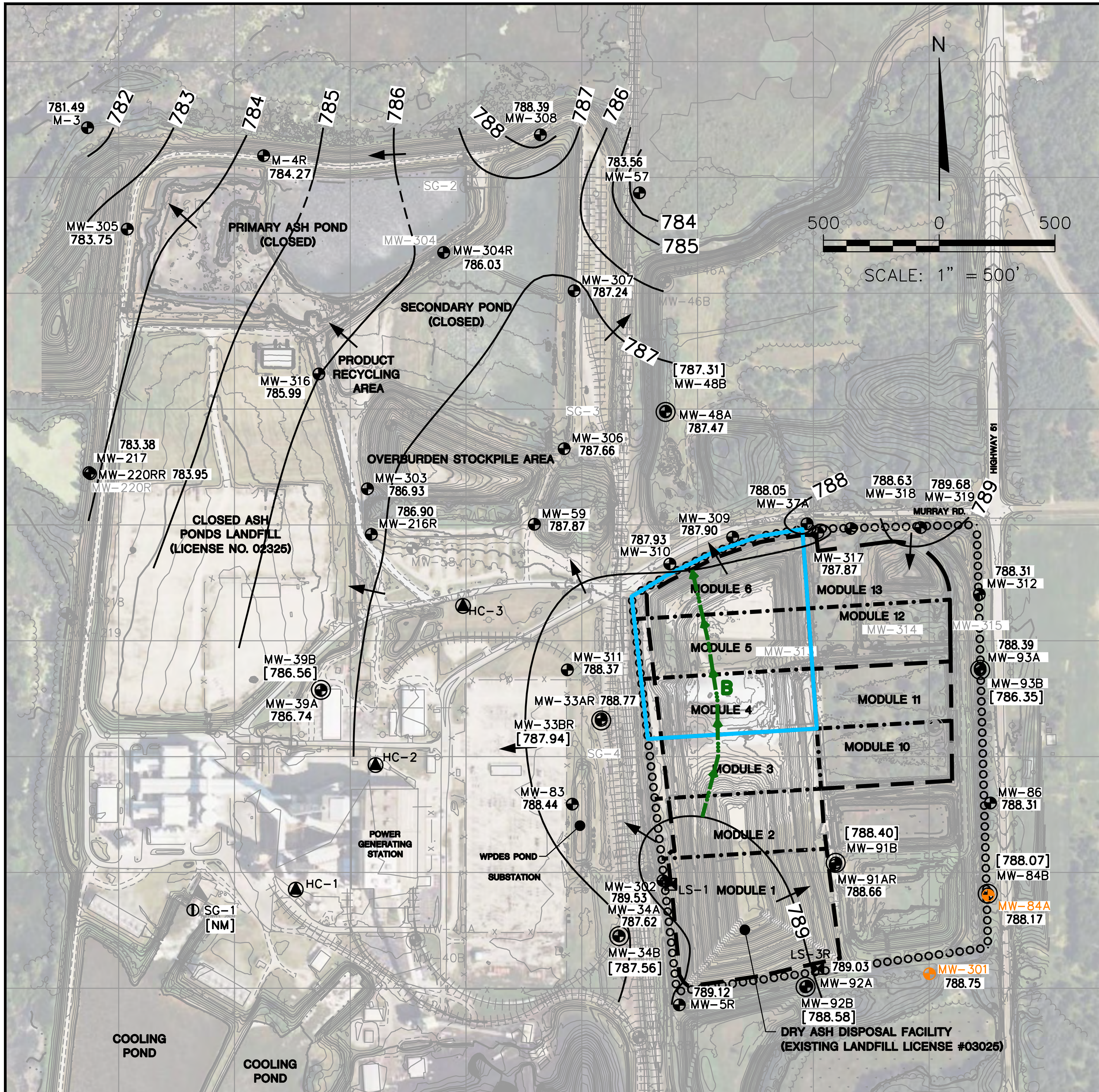


LEGEND

	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
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE WELL
	PIEZOMETER
	LYSIMETER
	ABANDONED WATER TABLE WELL
	ABANDONED PIEZOMETER
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
788.75	WATER TABLE ELEVATION
[781.47]	POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
[NM]	NOT MEASURED
	WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
	APPROXIMATE GROUNDWATER FLOW DIRECTION
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
	CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE ABANDONED BY HORIZON CONSTRUCTION AND EXPLORATION ON MAY 22-23, 2024.
10. BACKGROUND MONITORING WELLS ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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

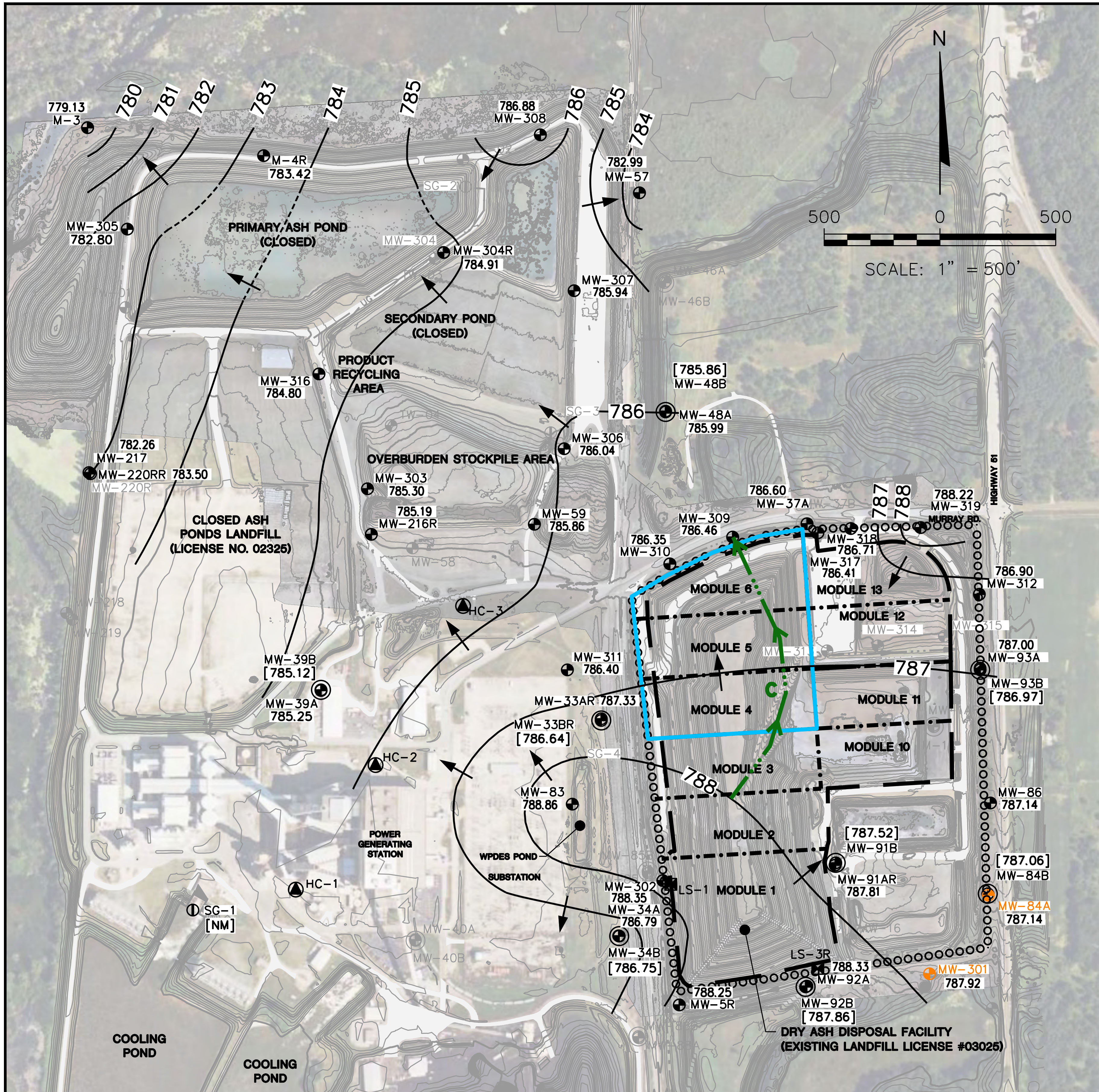
CLIENT: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, W8375 MURRAY ROAD, PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
AUGUST 15, 2024

FIGURE 4

I:\25224067.00\Drawings\COL August 2024 WTBL CCR Units.dwg, 1/21/2025 1:21:52 PM



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
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED STAFF GUAGE
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 788.75 WATER TABLE ELEVATION
- [781.47] POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- [NM] NOT MEASURED
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, PERIODIC SURVEYS BY SCS ENGINEERS AND CEDAR CREEK SURVEYING, LLC, AND DECEMBER 2023 DRONE SURVEY BY AMES.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE ABANDONED BY HORIZON CONSTRUCTION AND EXPLORATION ON MAY 22-23, 2024.
10. BACKGROUND MONITORING WELLS ARE: MW-301 AND MW-84A.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK (01/21/2025)
REVISED:	01/21/2025	APPROVED BY:	TK (01/21/2025)

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
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
OCTOBER 1-3, 2024

FIGURE 5

I:\25224067.00\Drawings\COL October 2024 WTBL CCR Units.dwg, 1/21/2025 1:24:01 PM

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

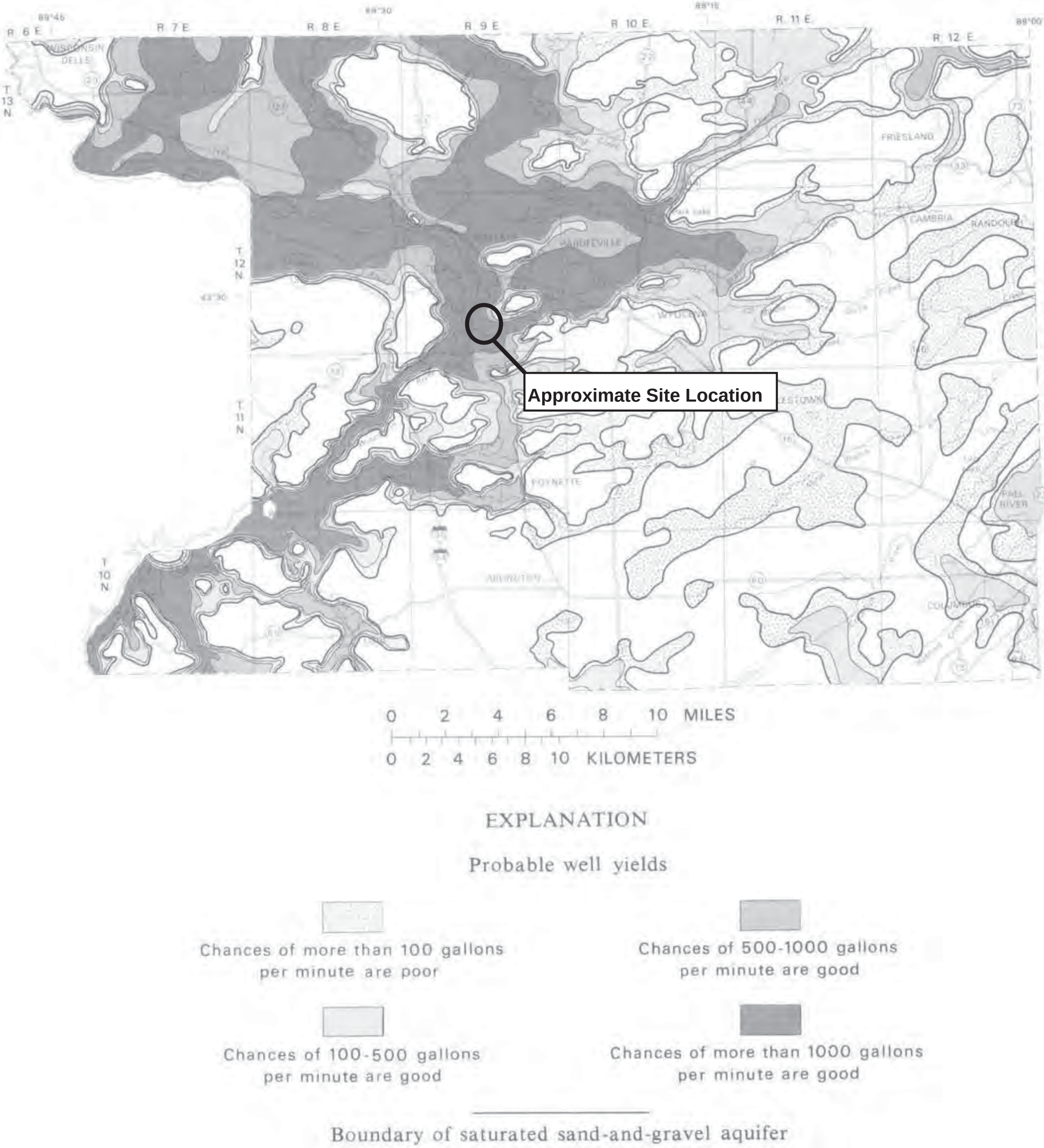
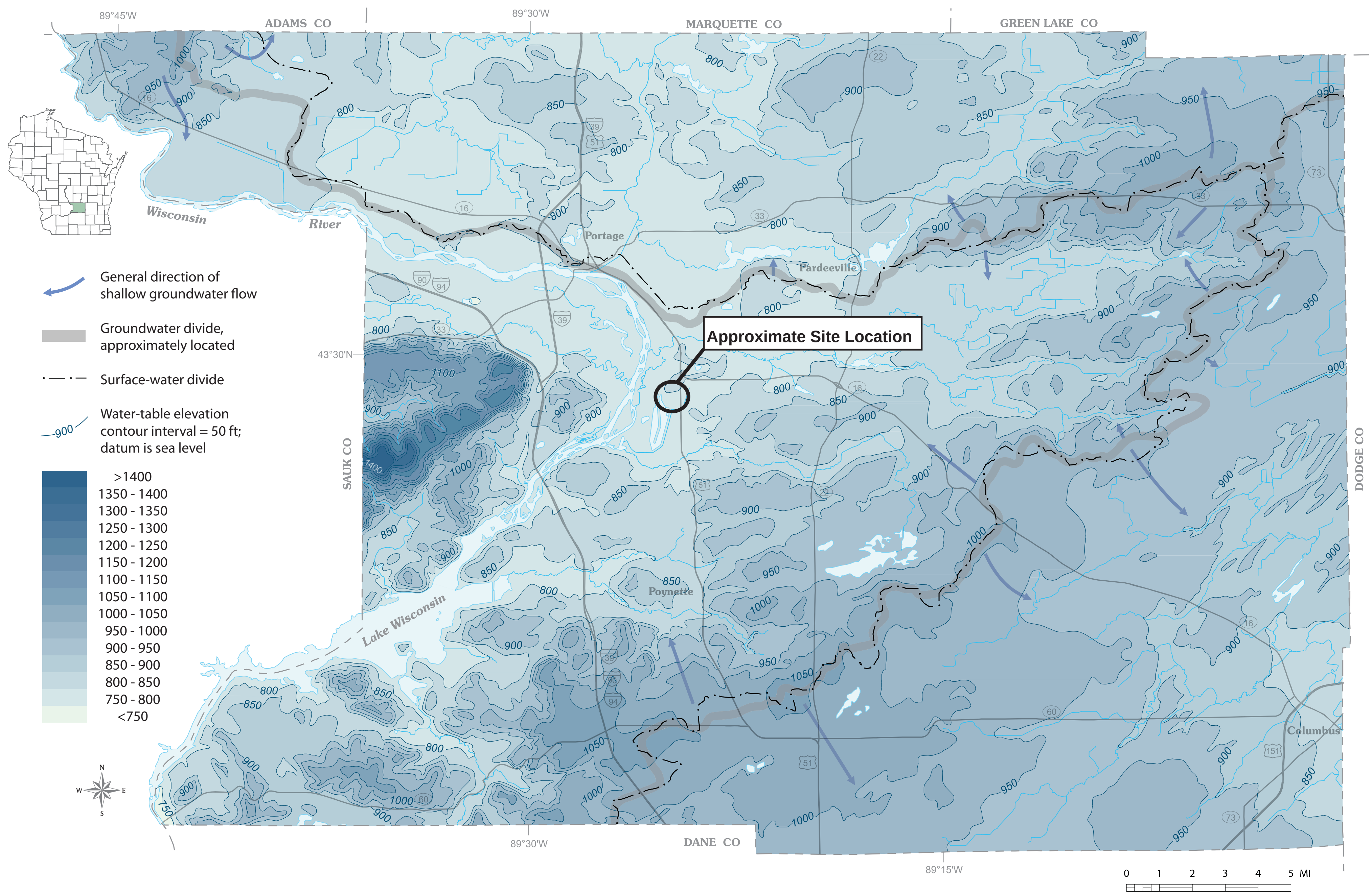


Figure 9. Probably well yields from the sand-and-gravel aquifer.

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



Extension Wisconsin Geological and Natural History Survey

02/26/2025 - Classification: Internal - ECRM13462136

Source: Sellwood, Stephen M., 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 No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	Qu	W	LL	PL	D
					0	Dark Brown Silty SAND (SM)					
					5–10	Brown Fine to Medium SAND, Little Silt, Trace to Little Gravel and Boulders (SM)					
					37	End Boring at 37'					
					40	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

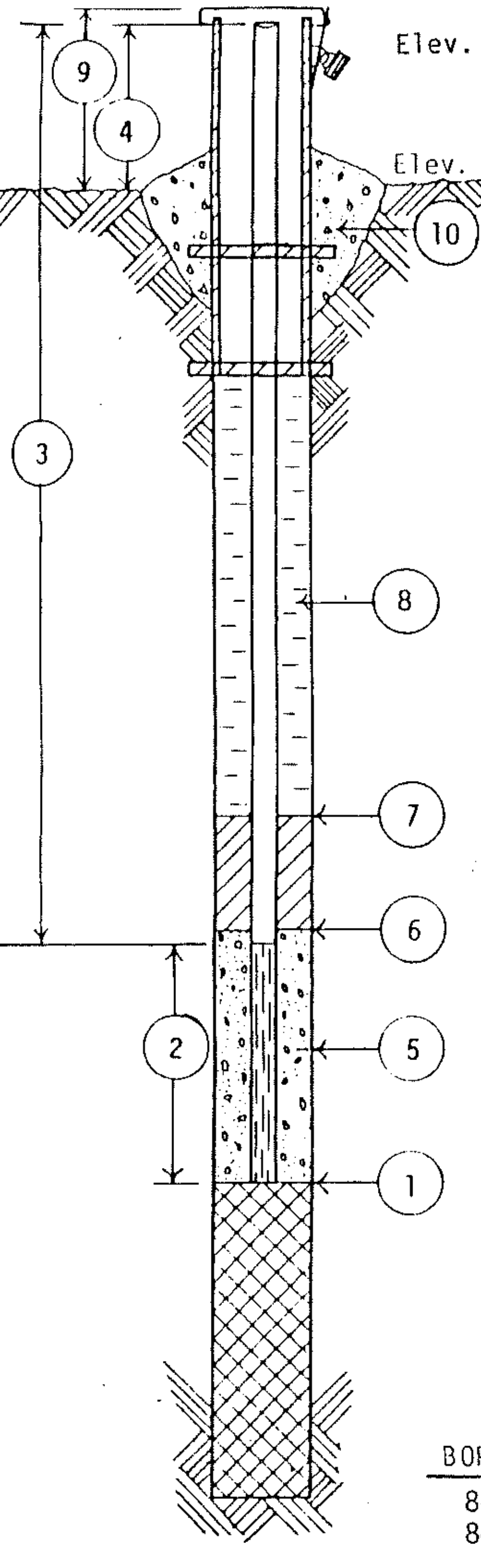
BORING NO. MW-84A

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 IN

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 Feet ☐ S ☐ E 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	U S C S	Graphic Log	Well Diagram	PID/FID	Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
				SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.										
S1	21	7 6 9 10	2							M				
S2	20	6 7 9 10	4	Same as above except, 10YR 5/4 (top section), 10YR 3/6 (bottom section), trace gravel.						M				
			6	Same as above except, 10YR 3/4 (bottom), 10YR 5/4 (top), trace little roots and sticks, trace gravel.										
S3	22	7 6 9 6	7		SM					M				
S4	21	4 5 6 5	9	Same as above except, 10YR (top), 10YR 4/6 (bottom), trace clay at bottom.						M				
S5	18	2 2 4 5	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	14	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	Firm	
[signature]	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.

SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number MW-301 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	U S C S	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.	SM									
S7	20	5 4 4 3	17							M				
			18											
			19											
S8	20	2 4 4 5	20							W				
			21											
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

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 - Alliant Columbia Generating Station SCS#: 25217156.01		MW-309

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mark Crampton Badger State Drilling, Co.	2/13/2018	2/14/2018	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VR111		MW-309	26.7 Feet MSL	809.88 Feet MSL	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 543,448 N, 2,124,151 E S/C/N
NW 1/4 of SE 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	Town of Pacific

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	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0–8.5	Hydrovaced boring to 8.5 below ground surface; open hole.										
			8.5	POORLY GRADED SAND, fine to coarse, yellow, (10YR 7/6), rounded grains.										
S1	20	11 14 18							N/A	M				
S2	20	12 15 20 28		Same but with trace gravel.	SP				N/A	M				
S3	24	16 20 26		Same as above but with no gravel.					N/A	M				

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

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-309 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	U S C S	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
			16	POORLY GRADED SAND, fine to coarse, yellow, (10YR 7/6), rounded grains, trace silt.										
S4	22	11 17 32 41	17						N/A	M				
S5		22 29 36	19–20						N/A	M				
S6	24	18 20 28 36	22						N/A	M				
S7		18 24 32	24–25						N/A	M				
			26		SP									
S8	22	14 18 30 40	27						N/A	W				Depth to water at ~ 26 feet.
S9	22	22 32 34	29–30						N/A	W				
			31–36											
				End of Boring at 36.5 feet 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 - Alliant Columbia Generating Station SCS#: 25217156.01		MW-310

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Dave Cruise Badger State Drilling, Co.	2/13/2018	2/13/2018	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VR110		MW-310	27.9 Feet MSL	810.96 Feet MSL	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 543,332 N, 2,123,880 E S/C/N
NW 1/4 of SE 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	Town of Pacific

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0–8	Hydrovaced boring to 8 feet below ground surface; open hole.										
			8	POORLY GRADED SAND AND GRAVEL, fine to medium sand, coarse gravel, brownish yellow, (10YR 6/6), angular gravel, round sand.	SP									
S1	18	4 6 8 8	9–10						N/A	M				
			11	Same as above but trace gravel.										
S2	24	18 27 38 40	12						N/A	M				
S3	24	26 32 40 38	14–15						N/A	M				

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

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-310 Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	POORLY GRADED SAND AND GRAVEL, fine to medium sand, coarse gravel, brownish yellow, (10YR 6/6), angular gravel, round sand.										
S4	10	25 50/5	17						N/A	M				Tough drilling
			18											
			19											
S5	24	38 60 50/4							N/A	M				
			20											
			21											
S6	12	38 50/5	22						N/A	M				
			23											
			24											
S7	24	32 46 50/4							N/A	M				
			25											
			26		SP									
S8	16	25 40 50/5	27						N/A	W				Depth to water at ~26 feet
			28											
			29											
S9		32 25 50/5							N/A	W				
			30											
			31											
			32											
			33											
			34											
			35											
			36											
				End of Boring at 36.5 feet 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 - Alliant Columbia Generating Station SCS#: 25217156.01		MW-311

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mark Crampton Badger State Drilling, Co.	2/14/2018	2/14/2018	hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VR112		MW-311	23.5 Feet MSL	806.53 Feet MSL	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 542,874 N, 2,123,437 E S/C/N
NE 1/4 of SW 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	Town of Pacific

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0–8	Hydrovaced boring to 8 feet below ground surface; open hole.										
			8	POORLY GRADED SAND AND GRAVEL, fine to coarse sand, coarse gravel, yellow, (10YR 7/6), rounded sand, angular gravel.	SP									
S1	24	12 16 20 24							N/A	M				
S2	24	17 27 30 38	12	Same as above but with trace silt.					N/A	M				
S3	24	18 26 31							N/A	M				

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

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

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SOIL BORING LOG INFORMATION SUPPLEMENT

Form 4400-122A

Boring Number MW-311 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	U S C S	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
			16	POORLY GRADED SAND AND GRAVEL, fine to coarse sand, coarse gravel, yellow, (10YR 7/6), rounded sand, angular gravel, trace silt.										
S4	24	18 30 40 50/5	17						N/A	M				
			18											
			19											
S5	24	30 40 45	20						N/A	M				
			21											
S6	8	45 34 50/3	22						N/A	M+/W				
			23											
			24		SP									
S7	18	46 50/5	25						N/A	W				Depth to water at ~25 feet.
			26											
S8	20	46 54 54 50/4	27						N/A	W				
			28											
			29											
S9	24	25 38 50/5	30	Same as above but with thin silt seams.					N/A	W				
			31											
			32											
			33	End of Boring at 33 feet bgs.										

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 ☐ 5 0
Hollow Stem Auger ☒ 4 1
Other ☐

15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1
Drilling Mud ☐ 0 3 None ☒ 9 9

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.

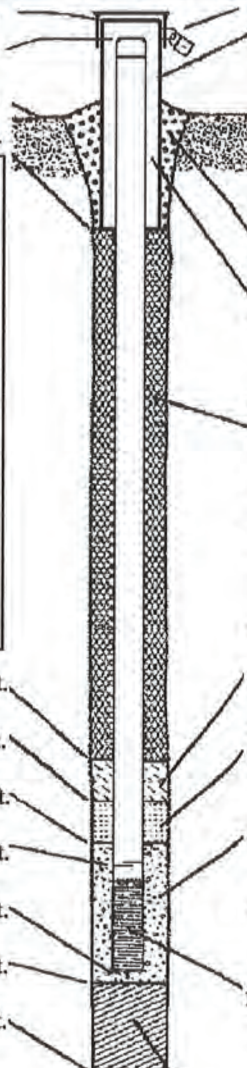
J. Filter pack, bottom 776.69 ft. MSL or 27 ft.

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 ☒ 0 4 / Other ☐
   d. Additional protection? ☒ Yes ☐ No
   If yes, describe: bumper posts
3. Surface seal: Bentonite ☒ 3 0 / Concrete ☐ 0 1 / Other ☐
4. Material between well casing and protective pipe: Bentonite ☒ 3 0
   Bentonite to grade, sand above Other ☐
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 3 3
   b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
   c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 3 1
   d. ____ % Bentonite . . . . . . Bentonite-cement grout ☐ 5 0
   e. ____ Ft^3 volume added for any of the above
   f. How installed: Tremie ☐ 0 1 / Tremie pumped ☐ 0 2 / Gravity ☐ 0 8
6. Bentonite seal: a. Bentonite granules ☐ 3 3
   b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 3 2
   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 ☒ 2 3
   Flush threaded PVC schedule 80 ☐ 2 4
   Other ☐
10. Screen material: PVC
    a. Screen type: Factory cut ☒ 1 1 / Continuous slot ☐ 0 1 / Other ☐
    b. Manufacturer Johnson
    c. Slot size: 0.01 in.
    d. Slotted length: 10 ft.
11. Backfill material (below filter pack): None ☐ 1 4
    Native Other ☒

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

Signature	Firm
[signature]	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.

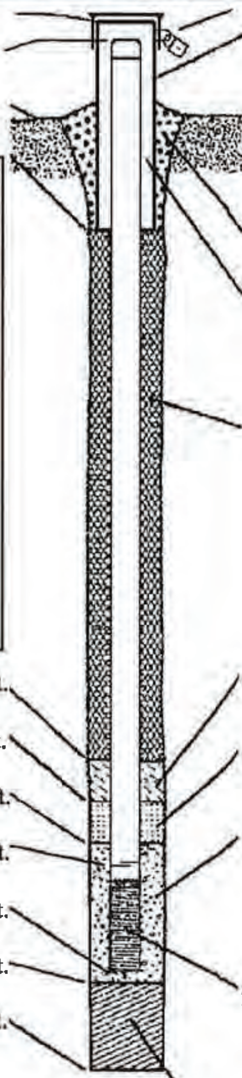
SCS # 25217156.01

State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater [ ] Waste Management [X]
Remediation/Redevelopment [ ] Other [ ]

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

Facility/Project Name WPL-Columbia Generating Station	Local Grid Location of Well 543447.673 ft. [X] N. [ ] S. 2124151.113 ft. [X] E. [ ] W.	Well Name MW-309
Facility License, Permit or Monitoring No.	Local Grid Origin [ ] (estimated: [ ]) or Well Location [ ] Lat. ° ' " Long. ° ' " or	Wis. Unique Well No. VR111 / DNR Well ID No.
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed 02 / 14 / 2018 (m m d d y y y y)
Type of Well Well Code 11 / MW	Section Location of Waste/Source NW 1/4 of SE 1/4 of Sec. 27, T. 12 N, R. 09 [X] E [ ] W	Well Installed By: Name (first, last) and Firm Mark Crampton Badger State Drilling Co., Inc.
Distance from Waste/Source ft. / Enf. Stds. Apply [X]	Location of Well Relative to Waste/Source u [ ] Upgradient s [ ] Sidegradient d [X] Downgradient n [ ] Not Known / Gov. Lot Number	



A. Protective pipe, top elevation 813.59 ft. MSL

B. Well casing, top elevation 813.28 ft. MSL

C. Land surface elevation 809.88 ft. MSL

D. Surface seal, bottom 807.61 ft. MSL or 2.27 ft.

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

13. Sieve analysis performed? [X] Yes [ ] No

14. Drilling method used: Rotary [ ] 5 0
Hollow Stem Auger [X] 4 1
Other [ ]

15. Drilling fluid used: Water [ ] 0 2 Air [ ] 0 1
Drilling Mud [ ] 0 3 None [X] 9 9

16. Drilling additives used? [ ] Yes [X] No

Describe --

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

--

E. Bentonite seal, top 807.61 ft. MSL or 2.27 ft.

F. Fine sand, top 788.61 ft. MSL or 21.27 ft.

G. Filter pack, top 786.61 ft. MSL or 23.27 ft.

H. Screen joint, top 785.61 ft. MSL or 24.27 ft.

I. Well bottom 775.61 ft. MSL or 34.27 ft.

J. Filter pack, bottom 773.38 ft. MSL or 36.5 ft.

K. Borehole, bottom 773.38 ft. MSL or 36.5 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.01 in.

1. Cap and lock? [X] Yes [ ] No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel [X] 0 4
Other [ ]
d. Additional protection? [ ] Yes [X] No
If yes, describe:

3. Surface seal: Bentonite [X] 3 0
Concrete [ ] 0 1
Other [ ]

4. Material between well casing and protective pipe:
Bentonite [ ] 3 0
Filter Sand (#5) Other [X]

5. Annular space seal: a. Granular/Chipped Bentonite [X] 3 3
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry [ ] 3 5
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry [ ] 3 1
d. ___ % Bentonite . . . . . . Bentonite-cement grout [ ] 5 0
e. 0.342 Ft^3 volume added for any of the above
f. How installed: Tremie [ ] 0 1
Tremie pumped [ ] 0 2
Gravity [X] 0 8

6. Bentonite seal: a. Bentonite granules [ ] 3 3
b. [ ] 1/4 in. [X] 3/8 in. [ ] 1/2 in. Bentonite chips [X] 3 2
c. Other [ ]

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley #7 (1 bag) [X]
b. Volume added ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 (6 bags) [X]
b. Volume added ft^3

9. Well casing: Flush threaded PVC schedule 40 [X] 2 3
Flush threaded PVC schedule 80 [ ] 2 4
Other [ ]

10. Screen material: PVC
a. Screen type: Factory cut [X] 1 1
Continuous slot [ ] 0 1
Other [ ]
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None [X] 1 4
Other [ ]

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

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 # 25217156.01

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 Generating Station

Local Grid Location of Well: 543331.971 ft. ☒ N. ☐ S. 2123879.85 ft. ☒ E. ☐ W.

Well Name: MW-310

Facility License, Permit or Monitoring No.

Local Grid Origin ☐ (estimated: ☐) or Well Location ☐
Lat. ____ ° ____ ' ____ " Long. ____ ° ____ ' ____ " or

Wis. Unique Well No.: VR110

DNR Well ID No.

Facility ID

St. Plane ____ ft. N, ____ ft. E. S/C/N

Date Well Installed: 02 / 13 / 2018 (m m / d d / y y y y)

Type of Well
Well Code 11 / MW

Section Location of Waste/Source
NW 1/4 of SE 1/4 of Sec. 27, T. 12 N, R. 09 ☒ E ☐ W

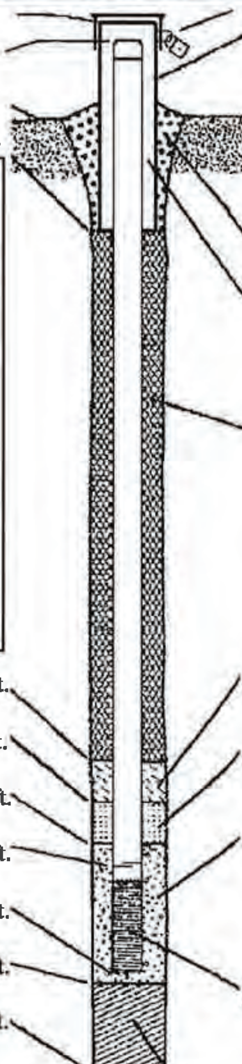
Well Installed By: Name (first, last) and Firm
Dave Cruise
Badger State Drilling Co., Inc.

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 813.93 ft. MSL

B. Well casing, top elevation 813.62 ft. MSL

C. Land surface elevation 810.96 ft. MSL

D. Surface seal, bottom 809.21 ft. MSL or 1.75 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 ☐ 5 0
Hollow Stem Auger ☒ 4 1
Other ☐

15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1
Drilling Mud ☐ 0 3 None ☒ 9 9

16. Drilling additives used? ☐ Yes ☒ No

Describe --

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

E. Bentonite seal, top 809.21 ft. MSL or 1.75 ft.

F. Fine sand, top 789.21 ft. MSL or 21.75 ft.

G. Filter pack, top 787.21 ft. MSL or 23.75 ft.

H. Screen joint, top 785.21 ft. MSL or 25.75 ft.

I. Well bottom 775.21 ft. MSL or 35.75 ft.

J. Filter pack, bottom 774.46 ft. MSL or 36.5 ft.

K. Borehole, bottom 774.46 ft. MSL or 36.5 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.01 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 0 4
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:

3. Surface seal: Bentonite ☒ 3 0
Concrete ☐ 0 1
Other ☐

4. Material between well casing and protective pipe:
Bentonite ☐ 3 0
Filter Sand (#5) Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 3 1
d. ____ % Bentonite . . . . . . Bentonite-cement grout ☐ 5 0
e. 0.369 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 0 1
Tremie pumped ☐ 0 2
Gravity ☒ 0 8

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

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley #7 (1 bag) ☒
b. Volume added ____ ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 (7 bags) ☒
b. Volume added ____ ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3
Flush threaded PVC schedule 80 ☐ 2 4
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 1 1
Continuous slot ☐ 0 1
Other ☐
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 1 4
Other ☐

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

Signature

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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SCS # 25217156.01

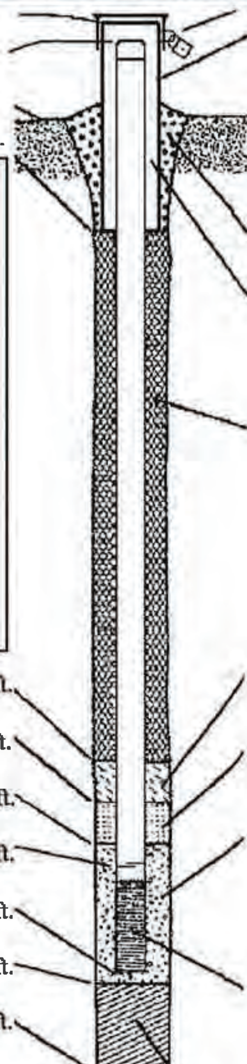
State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name WPL-Columbia Generating Station	Local Grid Location of Well 542874.39 ft. ☒ N. ☐ S. 2123437.50 ft. ☒ E. ☐ W.	Well Name MW-311
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. ° ' " Long. ° ' " or	Wis. Unique Well No. VR112 / DNR Well ID No.
Facility ID	St. Plane ft. N, ft. E. S/C/N	Date Well Installed 02 / 14 / 2018 (m m / d d / y y y y)
Type of Well Well Code 11 / MW	Section Location of Waste/Source NE 1/4 of SW 1/4 of Sec. 27, T. 12 N, R. 09 ☒ E ☐ W	Well Installed By: Name (first, last) and Firm Mark Crampton Badger State Drilling Co., Inc.
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 810.05 ft. MSL

B. Well casing, top elevation 809.74 ft. MSL

C. Land surface elevation 806.53 ft. MSL

D. Surface seal, bottom 803.55 ft. MSL or 2.98 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 ☐ 5 0
Hollow Stem Auger ☒ 4 1
Other ☐

15. Drilling fluid used: Water ☐ 0 2 Air ☐ 0 1
Drilling Mud ☐ 0 3 None ☒ 9 9

16. Drilling additives used? ☐ Yes ☒ No

Describe --

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

E. Bentonite seal, top 803.55 ft. MSL or 2.98 ft.

F. Fine sand, top 787.55 ft. MSL or 18.98 ft.

G. Filter pack, top 785.55 ft. MSL or 20.98 ft.

H. Screen joint, top 783.55 ft. MSL or 22.98 ft.

I. Well bottom 773.55 ft. MSL or 32.98 ft.

J. Filter pack, bottom 773.53 ft. MSL or 33 ft.

K. Borehole, bottom 773.53 ft. MSL or 33 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.38 in.

N. I.D. well casing 2.01 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6 in.
b. Length: 5 ft.
c. Material: Steel ☒ 0 4
Other ☐
d. Additional protection? ☐ Yes ☒ No
If yes, describe:

3. Surface seal: Bentonite ☒ 3 0
Concrete ☐ 0 1
Other ☐

4. Material between well casing and protective pipe:
Bentonite ☐ 3 0
Filter Sand (#5) Other ☒

5. Annular space seal: a. Granular/Chipped Bentonite ☒ 3 3
b. ____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 3 5
c. ____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 3 1
d. ____ % Bentonite . . . . . . Bentonite-cement grout ☐ 5 0
e. 0.288 Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 0 1
Tremie pumped ☐ 0 2
Gravity ☒ 0 8

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

7. Fine sand material: Manufacturer, product name & mesh size
a. RW Sidley #7 (1 bag) ☒
b. Volume added ft^3

8. Filter pack material: Manufacturer, product name & mesh size
a. RW Sidley #5 (6 bags) ☒
b. Volume added ft^3

9. Well casing: Flush threaded PVC schedule 40 ☒ 2 3
Flush threaded PVC schedule 80 ☐ 2 4
Other ☐

10. Screen material: PVC
a. Screen type: Factory cut ☒ 1 1
Continuous slot ☐ 0 1
Other ☐
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 10 ft.

11. Backfill material (below filter pack): None ☒ 1 4
Other ☐

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

Signature	Firm
[signature]	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 # 25217156.01

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	
WPL - Alliant Columbia Generating Station	Columbia	MW-309	
Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VR111	

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: 75 min.

4. Depth of well (from top of well casisng): 37.67 ft.

5. Inside diameter of well: 2.0 in.

6. Volume of water in filter pack and well casing: 7.04 gal.

7. Volume of water removed from well: 50.0 gal.

8. Volume of water added (if any): ___ gal.

9. Source of water added ____________

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

		Before Development	After Development
11. Depth to Water (from top of well casing)	a.	30.07 ft.	32.29 ft.
Date	b.	02/16/2018 (mm dd yyyy)	02/16/2018 (mm dd yyyy)
Time	c.	12:47 ☐ a.m. ☒ p.m.	13:50 ☐ a.m. ☒ p.m.
12. Sediment in well bottom		___ inches	___ inches
13. Water clarity		Clear ☐ 10 / Turbid ☒ 15 (Describe) Brown, Silty	Clear ☒ 20 / Turbid ☐ 25 (Describe)

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

	Before Development	After Development
14. Total suspended solids	___ mg/l	___ mg/l
15. COD	___ mg/l	___ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

17. Additional comments on development:
Two cycles of well purging dry and recharging.

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

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Kyle Kramer
Print Name: Kyle Kramer
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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

SCS # 25217156.01

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
WPL - Alliant Columbia Generating Station	Columbia	MW-310

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VR110	

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

2. Well development method
   - surged with bailer and bailed ☐ 4 1
   - surged with bailer and pumped ☒ 6 1
   - surged with block and bailed ☐ 4 2
   - surged with block and pumped ☐ 6 2
   - surged with block, bailed and pumped ☐ 7 0
   - compressed air ☐ 2 0
   - bailed only ☐ 1 0
   - pumped only ☐ 5 1
   - pumped slowly ☐ 5 0
   - Other ____ ☐

3. Time spent developing well: 171 min.

4. Depth of well (from top of well casisng): 38.41 ft.

5. Inside diameter of well: 2.0 in.

6. Volume of water in filter pack and well casing: 7.28 gal.

7. Volume of water removed from well: 60.0 gal.

8. Volume of water added (if any): ___ gal.

9. Source of water added ____

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

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	30.55 ft.	32.30 ft.
b. Date (mm/dd/yyyy)	2/16/2018	2/16/2018
c. Time	9:45 ☒ a.m. ☐ p.m.	12:36 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___ inches	___ inches
13. Water clarity	Clear ☐ 1 0 / Turbid ☒ 1 5	Clear ☒ 2 0 / Turbid ☐ 2 5
(Describe)	brown silty	

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

14. Total suspended solids	___ mg/l	___ mg/l
15. COD	___ mg/l	___ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

17. Additional comments on development:

Four cycles of well purging dry and recharging.

Name and Address of Facility Contact /Owner/Responsible Party

First Name: Nate Last Name: Sievers

Facility/Firm: Wisconsin Power and Light

Street: W8375 Murray Road

City/State/Zip: Pardeeville, Wisconsin 53954

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

Signature: Kyle Kramer

Print Name: Kyle Kramer

Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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

SCS # 25217156.01

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
WPL - Alliant Columbia Generating Station	Columbia	MW-311

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
	11	VR112	

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 168 min.

4. Depth of well (from top of well casisng) 36.19 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 8.74 gal.

7. Volume of water removed from well 100.0 gal.

8. Volume of water added (if any) ___ gal.

9. Source of water added ______

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

	Before Development	After Development
11. Depth to Water (from top of well casing) a.	26.75 ft.	28.51 ft.
Date b. (mm/dd/yyyy)	2/16/2018	2/16/2018
Time c.	2:00 ☐ a.m. ☒ p.m.	4:48 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___ inches	___ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15	Clear ☒ 20 Turbid ☐ 25
(Describe)	brown silty	

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

14. Total suspended solids	___ mg/l	___ mg/l
15. COD	___ mg/l	___ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Kyle Last Name: Kramer
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Nate Last Name: Sievers
Facility/Firm: Columbia Dry Ash & Ash Pond Disposal Facilities
Street: W8375 Murray Road
City/State/Zip: Pardeeville, Wisconsin 53954

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Kyle Kramer
Print Name: Kyle Kramer
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

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

Appendix C

Laboratory Reports

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

October 30, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - 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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project:	25223067 COLUMBIA CCR MOD 4-6
Pace Project No.:	40269506

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

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Green Bay, WI 54302
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SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40269506001	**MW-309**	Water	10/09/23 10:55	10/13/23 09:15
40269506002	**MW-310**	Water	10/09/23 12:05	10/13/23 09:15
40269506003	**MW-311**	Water	10/09/23 12:55	10/13/23 09:15
40269506004	**FIELD BLANK MOD4**	Water	10/09/23 12:30	10/13/23 09:15

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SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40269506001	**MW-309**	EPA 6020B	KXS	2
			LB	7
		SM 2540C	TMK	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
40269506002	**MW-310**	EPA 6020B	KXS	2
			LB	7
		SM 2540C	TMK	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
40269506003	**MW-311**	EPA 6020B	KXS	2
			LB	7
		SM 2540C	TMK	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
40269506004	**FIELD BLANK MOD4**	EPA 6020B	KXS	2
		SM 2540C	TMK	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Sample: MW-309 **Lab ID: 40269506001** Collected: 10/09/23 10:55 Received: 10/13/23 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								
Boron	**41.5**	ug/L	10.0	3.0	1	10/17/23 05:40	10/20/23 23:49	7440-42-8	
Calcium	**66800**	ug/L	254	76.2	1	10/17/23 05:40	10/20/23 23:49	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.43**	Std. Units			1		10/09/23 10:55		
Field Specific Conductance	**1553**	umhos/cm			1		10/09/23 10:55		
Oxygen, Dissolved	**9.90**	mg/L			1		10/09/23 10:55	7782-44-7	
REDOX	**87.2**	mV			1		10/09/23 10:55		
Turbidity	**9.11**	NTU			1		10/09/23 10:55		
Static Water Level	**782.58**	feet			1		10/09/23 10:55		
Temperature, Water (C)	**12.5**	deg C			1		10/09/23 10:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**858**	mg/L	20.0	8.7	1		10/15/23 21:55		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/17/23 16:49		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**259**	mg/L	20.0	5.9	10		10/26/23 14:13	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 08:40	16984-48-8	
Sulfate	**80.6**	mg/L	20.0	4.4	10		10/26/23 14:13	14808-79-8	

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Sample: MW-310 **Lab ID: 40269506002** Collected: 10/09/23 12:05 Received: 10/13/23 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								
Boron	**65.6**	ug/L	10.0	3.0	1	10/17/23 05:40	10/20/23 23:56	7440-42-8	
Calcium	**37500**	ug/L	254	76.2	1	10/17/23 05:40	10/20/23 23:56	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.70**	Std. Units			1		10/09/23 12:05		
Field Specific Conductance	**949**	umhos/cm			1		10/09/23 12:05		
Oxygen, Dissolved	**10.05**	mg/L			1		10/09/23 12:05	7782-44-7	
REDOX	**106.6**	mV			1		10/09/23 12:05		
Turbidity	**2.32**	NTU			1		10/09/23 12:05		
Static Water Level	**782.32**	feet			1		10/09/23 12:05		
Temperature, Water (C)	**13.1**	deg C			1		10/09/23 12:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**554**	mg/L	20.0	8.7	1		10/15/23 21:55		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		10/17/23 16:54		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**71.3**	mg/L	10.0	3.0	5		10/26/23 15:14	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 08:55	16984-48-8	M0
Sulfate	**90.7**	mg/L	10.0	2.2	5		10/26/23 15:14	14808-79-8	

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Sample: MW-311 **Lab ID: 40269506003** Collected: 10/09/23 12:55 Received: 10/13/23 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								
Boron	**31.0**	ug/L	10.0	3.0	1	10/17/23 05:40	10/21/23 00:03	7440-42-8	
Calcium	**60900**	ug/L	254	76.2	1	10/17/23 05:40	10/21/23 00:03	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.46**	Std. Units			1		10/09/23 12:55		
Field Specific Conductance	**493.4**	umhos/cm			1		10/09/23 12:55		
Oxygen, Dissolved	**10.48**	mg/L			1		10/09/23 12:55	7782-44-7	
REDOX	**-101.8**	mV			1		10/09/23 12:55		
Turbidity	**0.31**	NTU			1		10/09/23 12:55		
Static Water Level	**782.22**	feet			1		10/09/23 12:55		
Temperature, Water (C)	**12.3**	deg C			1		10/09/23 12:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**270**	mg/L	20.0	8.7	1		10/15/23 21:56		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		10/17/23 16:56		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.0J**	mg/L	2.0	0.59	1		10/28/23 12:56	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/28/23 12:56	16984-48-8	M0
Sulfate	**10.8**	mg/L	2.0	0.44	1		10/28/23 12:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Sample: FIELD BLANK MOD4 **Lab ID: 40269506004** Collected: 10/09/23 12:30 Received: 10/13/23 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								
Boron	**<3.0**	ug/L	10.0	3.0	1	10/17/23 05:40	10/20/23 23:34	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	10/17/23 05:40	10/20/23 23:34	7440-70-2	
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		10/15/23 21:56		
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		10/17/23 17:00		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**<0.59**	mg/L	2.0	0.59	1		10/28/23 13:40	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/28/23 13:40	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/28/23 13:40	14808-79-8	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

QC Batch: 457666 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A | Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269506001, 40269506002, 40269506003, 40269506004

METHOD BLANK: 2628354 Matrix: Water
Associated Lab Samples: 40269506001, 40269506002, 40269506003, 40269506004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	10/19/23 20:38	
Calcium	ug/L	<76.2	254	10/19/23 20:38	

LABORATORY CONTROL SAMPLE: 2628355

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	248	99	80-120	
Calcium	ug/L	10000	10300	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2628356 2628357

Parameter	Units	40269463001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	33.5	250	250	288	286	102	101	75-125	1	20	
Calcium	ug/L	156000	10000	10000	181000	164000	252	80	75-125	10	20	P6

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
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

QC Batch: 457507 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269506001, 40269506002, 40269506003, 40269506004

METHOD BLANK: 2627853 | Matrix: Water
Associated Lab Samples: 40269506001, 40269506002, 40269506003, 40269506004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/23 21:53	

LABORATORY CONTROL SAMPLE: 2627854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	587	580	99	80-120	

SAMPLE DUPLICATE: 2627855

Parameter	Units	40269478001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	200	214	7	10	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

QC Batch:	457729	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40269506001, 40269506002, 40269506003, 40269506004

SAMPLE DUPLICATE: 2628588

Parameter	Units	40269023001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	4.7	4.7	0	20	1q,H6

SAMPLE DUPLICATE: 2628589

Parameter	Units	40269506001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	20	H6

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

QC Batch: 458607
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: 40269506001, 40269506002

METHOD BLANK: 2633793 Matrix: Water
Associated Lab Samples: 40269506001, 40269506002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	10/26/23 05:27	
Fluoride	mg/L	<0.095	0.32	10/26/23 05:27	
Sulfate	mg/L	<0.44	2.0	10/26/23 05:27	

LABORATORY CONTROL SAMPLE: 2633794

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.2	101	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	19.9	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633795 2633796

Parameter	Units	40269506002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	71.3	100	100	171	166	100	95	90-110	3	15	
Fluoride	mg/L	<0.095	2	2	2.3	2.3	110	112	90-110	1	15	M0
Sulfate	mg/L	90.7	100	100	190	182	99	91	90-110	4	15	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

QC Batch: 458621 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40269506003, 40269506004

METHOD BLANK: 2633857 Matrix: Water

Associated Lab Samples: 40269506003, 40269506004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	10/27/23 03:40	
Fluoride	mg/L	<0.095	0.32	10/28/23 12:26	
Sulfate	mg/L	<0.44	2.0	10/27/23 03:40	

LABORATORY CONTROL SAMPLE: 2633858

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.7	104	90-110	
Fluoride	mg/L	2	2.0	100	90-110	
Sulfate	mg/L	20	20.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633859 2633860

Parameter	Units	40269506003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.0J	20	20	21.7	21.8	99	99	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.3	2.3	113	114	90-110	1	15	M0
Sulfate	mg/L	10.8	20	20	30.2	30.3	97	98	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633861 2633862

Parameter	Units	40269514001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.7	100	100	119	121	98	99	90-110	1	15	
Fluoride	mg/L	<0.48	10	10	11.0	11.2	110	112	90-110	1	15	M0
Sulfate	mg/L	103	100	100	200	200	96	97	90-110	0	15	

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

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(920)469-2436

QUALIFIERS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

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.

DL - Adjusted Method Detection Limit.

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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40269506

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40269506001	**MW-309**	EPA 3010A	457666	EPA 6020B	457761
40269506002	**MW-310**	EPA 3010A	457666	EPA 6020B	457761
40269506003	**MW-311**	EPA 3010A	457666	EPA 6020B	457761
40269506004	**FIELD BLANK MOD4**	EPA 3010A	457666	EPA 6020B	457761
40269506001	**MW-309**				
40269506002	**MW-310**				
40269506003	**MW-311**				
40269506001	**MW-309**	SM 2540C	457507		
40269506002	**MW-310**	SM 2540C	457507		
40269506003	**MW-311**	SM 2540C	457507		
40269506004	**FIELD BLANK MOD4**	SM 2540C	457507		
40269506001	**MW-309**	EPA 9040	457729		
40269506002	**MW-310**	EPA 9040	457729		
40269506003	**MW-311**	EPA 9040	457729		
40269506004	**FIELD BLANK MOD4**	EPA 9040	457729		
40269506001	**MW-309**	EPA 300.0	458607		
40269506002	**MW-310**	EPA 300.0	458607		
40269506003	**MW-311**	EPA 300.0	458621		
40269506004	**FIELD BLANK MOD4**	EPA 300.0	458621		

40269506

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.

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	25223067 Columbia CCR Mod 4-6	Pace Project Manager	dan milewsky@pacelabs com,
Requested Due Date		Project #. 25223067		Pace Profile #:	

Regulatory Agency:

State / Location: WI

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

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

Requested Analysis Filtered (Y/N): Metals (B/Ca) N; Chloride/Fluoride/Sulfate N; TDS and pH N

ITEM #	SAMPLE ID	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	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals (B/Ca)	Chloride/Fluoride/Sulfate	TDS and pH	Residual Chlorine (Y/N)	
1		WT																					
2	MW-309	WT		10/9	1055				4										X	X	X		001
3	MW-310	WT		10/9	1205				4										X	X	X		002
4	MW-311	WT		10/9	1255				4										X	X	X		003
5	FIELD BLANK MOD4	WT		10/9	1230				4										X	X	X		004
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL SAMPLES UNFILTERED	Bridget Russell	10/12	1100							
	CS Logistics	10/13/23	0915	[signature]	10/13/23	0915	1.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: [signature] DATE Signed: 10/12/2023

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # 40269506

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

Lab Lot# of pH paper: 10n2723 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: SG Date/ Time:

	Glass							Plastic						Vials						Jars				General										
Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	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		2																					X		2.5 / 5
002									2		2																					X		2.5 / 5
003									2		2																					X		2.5 / 5
004									2		2																					X		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

10/13/23 SG

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	
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #: WO#:40269506

40269506

Client Name: SES 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 - 109 **Type of Ice:** Wet Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 0.0 /Corr: 0.0

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: 10/13/23 Initials: SG
Labeled By Initials: MH

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: - DI VOA Samples frozen upon receipt	☑Yes ☐No ☐Yes ☐No	5. 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: Correct Type: Pace Green Bay, Pace IR, Non-Pace	☑Yes ☐No	9.
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: Trip Blank Custody Seals Present Pace Trip Blank Lot # (if purchased):	☐Yes ☐No ☑N/A ☐Yes ☐No ☑N/A	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

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

November 06, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - 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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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CERTIFICATIONS

Project:	25223067 COLUMBIA CCR BACKGRND
Pace Project No.:	40269529

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572023-03
New Hampshire/TNI Certification #: 297622
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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

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SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40269529001	**MW-301**	Water	10/11/23 14:15	10/13/23 09:15
40269529002	**MW-84A**	Water	10/11/23 15:00	10/13/23 09:15

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40269529001	**MW-301**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40269529002	**MW-84A**	EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

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

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-301 **Lab ID: 40269529001** Collected: 10/11/23 14:15 Received: 10/13/23 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	10/17/23 06:27	10/19/23 01:12	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 01:12	7440-38-2	
Barium	**7.3**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 01:12	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 01:12	7440-41-7	
Boron	**36.2**	ug/L	10.0	3.0	1	10/17/23 06:27	10/19/23 01:12	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:12	7440-43-9	
Calcium	**52300**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 01:12	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 01:12	7440-47-3	
Cobalt	**0.13J**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 01:12	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 01:12	7439-92-1	
Lithium	**0.43J**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 01:12	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 01:12	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 01:12	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 01:12	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	10/18/23 10:55	10/19/23 06:31	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.06**	Std. Units			1		10/11/23 14:15		
Field Specific Conductance	**536**	umhos/cm			1		10/11/23 14:15		
Oxygen, Dissolved	**0.16**	mg/L			1		10/11/23 14:15	7782-44-7	
REDOX	**23.8**	mV			1		10/11/23 14:15		
Turbidity	**0.34**	NTU			1		10/11/23 14:15		
Static Water Level	**784.67**	feet			1		10/11/23 14:15		
Temperature, Water (C)	**10.7**	deg C			1		10/11/23 14:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**300**	mg/L	20.0	8.7	1		10/15/23 21:57		
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		10/18/23 16:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.1**	mg/L	2.0	0.59	1		10/26/23 16:25	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 16:25	16984-48-8	M0
Sulfate	**11.8**	mg/L	2.0	0.44	1		10/26/23 16:25	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: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-84A **Lab ID: 40269529002** Collected: 10/11/23 15:00 Received: 10/13/23 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	10/17/23 06:27	10/19/23 01:19	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	10/17/23 06:27	10/19/23 01:19	7440-38-2	
Barium	**12.7**	ug/L	2.3	0.70	1	10/17/23 06:27	10/19/23 01:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	10/17/23 06:27	10/19/23 01:19	7440-41-7	
Boron	**14.0**	ug/L	10.0	3.0	1	10/17/23 06:27	10/19/23 01:19	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	10/17/23 06:27	10/19/23 01:19	7440-43-9	
Calcium	**65100**	ug/L	254	76.2	1	10/17/23 06:27	10/19/23 01:19	7440-70-2	
Chromium	**1.6J**	ug/L	3.4	1.0	1	10/17/23 06:27	10/19/23 01:19	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	10/17/23 06:27	10/19/23 01:19	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	10/17/23 06:27	10/19/23 01:19	7439-92-1	
Lithium	**0.54J**	ug/L	1.0	0.22	1	10/17/23 06:27	10/19/23 01:19	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	10/17/23 06:27	10/19/23 01:19	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	10/17/23 06:27	10/19/23 01:19	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	10/17/23 06:27	10/19/23 01:19	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	10/18/23 10:55	10/19/23 06:33	7439-97-6	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.51**	Std. Units			1		10/11/23 15:00		
Field Specific Conductance	**599.9**	umhos/cm			1		10/11/23 15:00		
Oxygen, Dissolved	**8.44**	mg/L			1		10/11/23 15:00	7782-44-7	
REDOX	**91.2**	mV			1		10/11/23 15:00		
Turbidity	**0.03**	NTU			1		10/11/23 15:00		
Static Water Level	**784.39**	feet			1		10/11/23 15:00		
Temperature, Water (C)	**12.3**	deg C			1		10/11/23 15:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**324**	mg/L	20.0	8.7	1		10/15/23 21:58		
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		10/18/23 16:13		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.1**	mg/L	2.0	0.59	1		10/26/23 17:51	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/26/23 17:51	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		10/26/23 17:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457855
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2629305
Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	10/19/23 05:49	

LABORATORY CONTROL SAMPLE: 2629306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2629307 2629308

Parameter	Units	40269479001 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	5.2	4.9	103	98	85-115	6	20	

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Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457669 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A | Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2628366 | Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/18/23 21:17	
Arsenic	ug/L	<0.28	1.0	10/18/23 21:17	
Barium	ug/L	<0.70	2.3	10/18/23 21:17	
Beryllium	ug/L	<0.25	1.0	10/18/23 21:17	
Boron	ug/L	<3.0	10.0	10/18/23 21:17	
Cadmium	ug/L	<0.15	1.0	10/18/23 21:17	
Calcium	ug/L	<76.2	254	10/18/23 21:17	
Chromium	ug/L	<1.0	3.4	10/18/23 21:17	
Cobalt	ug/L	<0.12	1.0	10/18/23 21:17	
Lead	ug/L	<0.24	1.0	10/18/23 21:17	
Lithium	ug/L	<0.22	1.0	10/18/23 21:17	
Molybdenum	ug/L	<0.44	1.5	10/18/23 21:17	
Selenium	ug/L	<0.32	1.1	10/18/23 21:17	
Thallium	ug/L	<0.14	1.0	10/18/23 21:17	

LABORATORY CONTROL SAMPLE: 2628367

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	242	97	80-120	
Arsenic	ug/L	250	242	97	80-120	
Barium	ug/L	250	236	94	80-120	
Beryllium	ug/L	250	260	104	80-120	
Boron	ug/L	250	240	96	80-120	
Cadmium	ug/L	250	245	98	80-120	
Calcium	ug/L	10000	10400	104	80-120	
Chromium	ug/L	250	232	93	80-120	
Cobalt	ug/L	250	237	95	80-120	
Lead	ug/L	250	243	97	80-120	
Lithium	ug/L	250	239	95	80-120	
Molybdenum	ug/L	250	238	95	80-120	
Selenium	ug/L	250	251	100	80-120	
Thallium	ug/L	250	240	96	80-120	

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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2628368 2628369

Parameter	Units	40269514001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.22J	250	250	240	241	96	96	75-125	0	20	
Arsenic	ug/L	0.42J	250	250	241	245	96	98	75-125	2	20	
Barium	ug/L	18.3	250	250	251	252	93	94	75-125	0	20	
Beryllium	ug/L	<0.25	250	250	254	258	102	103	75-125	2	20	
Boron	ug/L	106	250	250	338	335	93	92	75-125	1	20	
Cadmium	ug/L	<0.15	250	250	241	241	96	96	75-125	0	20	
Calcium	ug/L	110000	10000	10000	120000	121000	97	105	75-125	1	20	
Chromium	ug/L	2.3J	250	250	230	233	91	92	75-125	2	20	
Cobalt	ug/L	0.17J	250	250	228	232	91	93	75-125	2	20	
Lead	ug/L	<0.24	250	250	241	243	96	97	75-125	1	20	
Lithium	ug/L	13.9	250	250	250	252	95	95	75-125	1	20	
Molybdenum	ug/L	7.4	250	250	244	243	94	94	75-125	0	20	
Selenium	ug/L	1.4	250	250	247	252	98	100	75-125	2	20	
Thallium	ug/L	0.15J	250	250	238	242	95	97	75-125	2	20	

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Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457507 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2627853 Matrix: Water

Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/23 21:53	

LABORATORY CONTROL SAMPLE: 2627854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	587	580	99	80-120	

SAMPLE DUPLICATE: 2627855

Parameter	Units	40269478001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	200	214	7	10	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 457892 | Analysis Method: EPA 9040
QC Batch Method: EPA 9040 | Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40269529001, 40269529002

SAMPLE DUPLICATE: 2629567

Parameter	Units	40269529001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

SAMPLE DUPLICATE: 2629568

Parameter	Units	40269609008 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.8	2	20	1q,H6

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 458622 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 2633879 Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	10/26/23 15:42	
Fluoride	mg/L	<0.095	0.32	10/26/23 15:42	
Sulfate	mg/L	<0.44	2.0	10/26/23 15:42	

LABORATORY CONTROL SAMPLE: 2633880

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.9	109	90-110	
Fluoride	mg/L	2	2.2	108	90-110	
Sulfate	mg/L	20	21.7	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633881 2633882

Parameter	Units	40269529001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.1	20	20	23.4	23.6	107	108	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.4	2.4	115	116	90-110	1	15	M0
Sulfate	mg/L	11.8	20	20	33.6	33.6	109	109	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2633883 2633884

Parameter	Units	40269593002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	523	400	400	935	935	103	103	90-110	0	15	
Sulfate	mg/L	277	400	400	697	694	105	104	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-301 | **Lab ID: 40269529001** | Collected: 10/11/23 14:15 | Received: 10/13/23 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	**-0.0576 ± 0.492 (1.00) C:NA T:85%**	pCi/L	11/01/23 14:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.611 ± 0.377 (0.692) C:84% T:85%**	pCi/L	10/25/23 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.611 ± 0.869 (1.69)**	pCi/L	11/02/23 11:24	7440-14-4	

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(920)469-2436

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Sample: MW-84A | **Lab ID: 40269529002** | Collected: 10/11/23 15:00 | Received: 10/13/23 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	**0.292 ± 0.445 (0.766) C:NA T:84%**	pCi/L	11/01/23 14:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.552 ± 0.360 (0.676) C:83% T:84%**	pCi/L	10/25/23 14:33	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.844 ± 0.805 (1.44)**	pCi/L	11/02/23 11:24	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch:	622852	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 3036014 Matrix: Water

Associated Lab Samples: 40269529001, 40269529002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0951 ± 0.264 (0.512) C:NA T:83%	pCi/L	11/01/23 14:15	

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Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

QC Batch: 622853 — Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 — Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40269529001, 40269529002

METHOD BLANK: 3036016 — Matrix: Water
Associated Lab Samples: 40269529001, 40269529002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.399 ± 0.328 (0.647) C:82% T:83%	pCi/L	10/25/23 14:31	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

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.

DL - Adjusted Method Detection Limit.

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: 25223067 COLUMBIA CCR BACKGRND
Pace Project No.: 40269529

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40269529001	**MW-301**	EPA 3010A	457669	EPA 6020B	457769
40269529002	**MW-84A**	EPA 3010A	457669	EPA 6020B	457769
40269529001	**MW-301**	EPA 7470	457855	EPA 7470	457902
40269529002	**MW-84A**	EPA 7470	457855	EPA 7470	457902
40269529001	**MW-301**				
40269529002	**MW-84A**				
40269529001	**MW-301**	EPA 903.1	622852		
40269529002	**MW-84A**	EPA 903.1	622852		
40269529001	**MW-301**	EPA 904.0	622853		
40269529002	**MW-84A**	EPA 904.0	622853		
40269529001	**MW-301**	Total Radium Calculation	626730		
40269529002	**MW-84A**	Total Radium Calculation	626730		
40269529001	**MW-301**	SM 2540C	457507		
40269529002	**MW-84A**	SM 2540C	457507		
40269529001	**MW-301**	EPA 9040	457892		
40269529002	**MW-84A**	EPA 9040	457892		
40269529001	**MW-301**	EPA 300.0	458622		
40269529002	**MW-84A**	EPA 300.0	458622		

40269529

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:

Company	SCS ENGINEERS
Address	2830 Dairy Drive
	Madison, WI 53718
Email	mblodgett@scsengineers com
Phone	608-216-7362 Fax
Requested Due Date	

Section B Required Project Information:

Report To	Meghan Blodgett
Copy To	
Purchase Order #	
Project Name	25223067 Columbia CCR Background
Project #	25223067

Section C Invoice Information:

Attention	
Company Name	
Address	
Pace Quote	
Pace Project Manager	dan.milewsky@pacelabs.com,
Pace Profile #:	

Regulatory Agency	
State / Location	WI

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

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

Requested Analysis Filtered (Y/N): Radium 226 N, Radium 228 N, Metals N, TDS and pH N, Chloride,Fluoride,Sulfate 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	Radium 226	Radium 228	Metals	TDS and pH	Chloride,Fluoride,Sulfate	Residual Chlorine (Y/N)	
1	MW-301	WT		10/11	1415				6										X	X	X	X	X		001
2	MW-84A	WT		10/11	1500				6										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	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Bridget Russell SCS Engs	10/12	1100							
	CS Logistics	10/13/23	0915	[illegible] Pace	10/13/23	0915	1.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: [signature] DATE Signed: 10/12/2023

Sample Preservation Receipt Form

Client Name: SCS

Project # 40269529

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

Lab Lot# of pH paper 10D2723 Lab Std #ID of preservation (if pH adjusted).

Initial when completed SS Date/ Time.

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		2															2						X		2.5 / 5
002									2		2															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

10/13/23 SS

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	1 poly HNO3
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #: WO#: 40269529

40269529

Client Name: SLS

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 - 109 **Type of Ice:** Wet Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr. 1.0 /Corr: 1.0

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 10/13/23 Initials: SG

Labeled By Initials: EL

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:				8.
For Analysis: ☑Yes ☐No MS/MSD:	☐Yes	☑No	☐N/A	
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:	☑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 logi

Page 2 of 2

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

November 14, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on November 10, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - 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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

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

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40270881001	**MW-309**	Water	11/09/23 10:45	11/10/23 09:15

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40270881001	**MW-309**		AG1	7
		EPA 300.0	HMB	1

PASI-G = Pace Analytical Services - Green Bay

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

SUMMARY OF DETECTION

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40270881001	**MW-309**					
	Field pH	7.25	Std. Units		11/09/23 10:45	
	Field Specific Conductance	1330	umhos/cm		11/09/23 10:45	
	Oxygen, Dissolved	7.45	mg/L		11/09/23 10:45	
	REDOX	169	mV		11/09/23 10:45	
	Turbidity	1.60	NTU		11/09/23 10:45	
	Static Water Level	782.76	feet		11/09/23 10:45	
	Temperature, Water (C)	13.5	deg C		11/09/23 10:45	
EPA 300.0	Sulfate	89.0	mg/L	10.0	11/13/23 02:25	

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Sample: MW-309 **Lab ID: 40270881001** Collected: 11/09/23 10:45 Received: 11/10/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.25**	Std. Units			1		11/09/23 10:45		
Field Specific Conductance	**1330**	umhos/cm			1		11/09/23 10:45		
Oxygen, Dissolved	**7.45**	mg/L			1		11/09/23 10:45	7782-44-7	
REDOX	**169**	mV			1		11/09/23 10:45		
Turbidity	**1.60**	NTU			1		11/09/23 10:45		
Static Water Level	**782.76**	feet			1		11/09/23 10:45		
Temperature, Water (C)	**13.5**	deg C			1		11/09/23 10:45		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Sulfate	**89.0**	mg/L	10.0	2.2	5		11/13/23 02:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

QC Batch:	460008	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40270881001

METHOD BLANK: 2641737 Matrix: Water
Associated Lab Samples: 40270881001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<0.44	2.0	11/10/23 10:35	

LABORATORY CONTROL SAMPLE: 2641738

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642222 2642223

Parameter	Units	40270832001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	99.2	100	100	207	205	107	106	90-110	1	15	

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

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QUALIFIERS

Project:	25223067 COLUMBIA CCR MOD 4-6
Pace Project No.:	40270881

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.

DL - Adjusted Method Detection Limit.

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
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Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40270881

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40270881001	**MW-309**				
40270881001	**MW-309**	EPA 300.0	460008		

40270881

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	Regulatory Agency
Email mblodgett@scsengineers com	Purchase Order #	Pace Quote	
Phone 608-216-7362 Fax	Project Name 25223067 Columbia CCR Mod 4-6	Pace Project Manager dan milewsky@pacelabs.com	State / Location
Requested Due Date	Project # 25223067	Pace Profile #:	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)

ITEM #	SAMPLE ID	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	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Sulfate (N)	Residual Chlorine (Y/N)	
1																					
2	MW-309	WT		11/9	1045		1348		1										X		001
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL SAMPLES UNFILTERED	[signature] SCS	11/9	1300							
	CS Logistics	11/10/2023	09:15	Matt VanSambeek Pace	11/10/2023	09:15	0.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ethan Schaefer

SIGNATURE of SAMPLER: [signature] DATE Signed: 11/9/23

Sample Preservation Receipt Form

Client Name: SCS Engineers

Project # 40270881

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

Lab Lot# of pH paper

Lab Std #ID of preservation (if pH adjusted).

Initial when completed MJB Date/Time

	Glass							Plastic						Vials						Jars				General										
Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	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																																		2.5 / 5
002																																		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
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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

MJB
11/10/2023

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	
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40270881

40270881

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 - 131 **Type of Ice:** Wet Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 0.5

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: 11/10/2023 /Initials: MK
Labeled By Initials: MK

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:	☑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 logi

Page 2 of 2

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

June 13, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 19, 2024. 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

Report revised to include radium data for MW-84A which was missing on the original report dated May 17, 2024.

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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

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

CERTIFICATIONS

Project:	25223067 COLUMBIA CCR BACKGROU
Pace Project No.:	40277089

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
ANABISO/IEC 17025:2017 Rad Cert#: L24170
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 2950
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA010
Louisiana DEQ/TNI Certification #: 04086
Maine Certification #: 2023021
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572023-03
New Hampshire/TNI Certification #: 297622
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-015
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: TN02867
Texas/TNI Certification #: T104704188-22-18
Utah/TNI Certification #: PA014572223-14
USDA Soil Permit #: 525-23-67-77263
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad

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

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

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40277089001	**MW-301**	Water	04/17/24 15:20	04/19/24 08:05
40277089002	**MW-84A**	Water	04/17/24 13:50	04/19/24 08:05

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

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40277089001	**MW-301**	EPA 6020B	TXW	15	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2320B	TMK	1	PASI-G
		SM 2540C	LMB	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
40277089002	**MW-84A**	EPA 6020B	TXW	15	PASI-G
		EPA 7470	RZA	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2320B	TMK	1	PASI-G
		SM 2540C	LMB	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G

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

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 **Lab ID: 40277089001** Collected: 04/17/24 15:20 Received: 04/19/24 08:05 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	04/23/24 07:07	04/29/24 03:14	7440-36-0	
Arsenic	**<0.28**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 03:14	7440-38-2	
Barium	**8.1**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 03:14	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 03:14	7440-41-7	
Boron	**24.9**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 03:14	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:14	7440-43-9	
Calcium	**102000**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 03:14	7440-70-2	
Chromium	**<1.0**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 03:14	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 03:14	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 03:14	7439-92-1	
Lithium	**0.63J**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 03:14	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 03:14	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 03:14	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 03:14	7440-28-0	
Total Hardness by 2340B	**455**	mg/L	1.7	0.32	1	04/23/24 07:07	04/29/24 03:14		
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	04/30/24 15:10	05/01/24 09:48	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.06**	Std. Units			1		04/17/24 15:20		
Field Specific Conductance	**781.0**	umhos/cm			1		04/17/24 15:20		
Oxygen, Dissolved	**2.53**	mg/L			1		04/17/24 15:20	7782-44-7	
REDOX	**17.90**	mV			1		04/17/24 15:20		
Turbidity	**0.00**	NTU			1		04/17/24 15:20		
Static Water Level	**785.27**	feet			1		04/17/24 15:20		
Temperature, Water (C)	**8.6**	deg C			1		04/17/24 15:20		
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**446**	mg/L	10.0	5.0	1		04/23/24 11:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**458**	mg/L	20.0	8.7	1		04/23/24 14:49		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.9**	Std. Units	0.10	0.010	1		04/22/24 18:03		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 **Lab ID: 40277089001** Collected: 04/17/24 15:20 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**1.6J**	mg/L	2.0	0.59	1		05/02/24 21:12	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 21:12	16984-48-8	
Sulfate	**11.5**	mg/L	2.0	0.44	1		05/02/24 21:12	14808-79-8	

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A **Lab ID: 40277089002** Collected: 04/17/24 13:50 Received: 04/19/24 08:05 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	04/23/24 07:07	04/29/24 03:19	7440-36-0	
Arsenic	**0.29J**	ug/L	1.0	0.28	1	04/23/24 07:07	04/29/24 03:19	7440-38-2	
Barium	**14.4**	ug/L	2.3	0.70	1	04/23/24 07:07	04/29/24 03:19	7440-39-3	
Beryllium	**<0.25**	ug/L	1.0	0.25	1	04/23/24 07:07	04/29/24 03:19	7440-41-7	
Boron	**11.9**	ug/L	10.0	3.0	1	04/23/24 07:07	04/29/24 03:19	7440-42-8	
Cadmium	**<0.15**	ug/L	1.0	0.15	1	04/23/24 07:07	04/29/24 03:19	7440-43-9	
Calcium	**73700**	ug/L	254	76.2	1	04/23/24 07:07	04/29/24 03:19	7440-70-2	
Chromium	**2.1J**	ug/L	3.4	1.0	1	04/23/24 07:07	04/29/24 03:19	7440-47-3	
Cobalt	**<0.12**	ug/L	1.0	0.12	1	04/23/24 07:07	04/29/24 03:19	7440-48-4	
Lead	**<0.24**	ug/L	1.0	0.24	1	04/23/24 07:07	04/29/24 03:19	7439-92-1	
Lithium	**0.67J**	ug/L	1.0	0.22	1	04/23/24 07:07	04/29/24 03:19	7439-93-2	
Molybdenum	**<0.44**	ug/L	1.5	0.44	1	04/23/24 07:07	04/29/24 03:19	7439-98-7	
Selenium	**<0.32**	ug/L	1.1	0.32	1	04/23/24 07:07	04/29/24 03:19	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	04/23/24 07:07	04/29/24 03:19	7440-28-0	
Total Hardness by 2340B	**337**	mg/L	1.7	0.32	1	04/23/24 07:07	04/29/24 03:19		
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	04/30/24 15:10	05/01/24 09:51	7439-97-6	
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.68**	Std. Units			1		04/17/24 13:50		
Field Specific Conductance	**588.1**	umhos/cm			1		04/17/24 13:50		
Oxygen, Dissolved	**7.82**	mg/L			1		04/17/24 13:50	7782-44-7	
REDOX	**0.00**	mV			1		04/17/24 13:50		
Turbidity	**0.00**	NTU			1		04/17/24 13:50		
Static Water Level	**784.90**	feet			1		04/17/24 13:50		
Temperature, Water (C)	**11.0**	deg C			1		04/17/24 13:50		
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**335**	mg/L	10.0	5.0	1		04/23/24 11:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**322**	mg/L	20.0	8.7	1		04/23/24 14:49		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.2**	Std. Units	0.10	0.010	1		04/22/24 18:04		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A **Lab ID: 40277089002** Collected: 04/17/24 13:50 Received: 04/19/24 08:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**3.2**	mg/L	2.0	0.59	1		05/02/24 21:26	16887-00-6	
Fluoride	**0.12J**	mg/L	0.32	0.095	1		05/02/24 21:26	16984-48-8	
Sulfate	**1.4J**	mg/L	2.0	0.44	1		05/02/24 21:26	14808-79-8	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 473092
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2709401 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/01/24 09:18	

LABORATORY CONTROL SAMPLE: 2709402

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2709403 2709404

Parameter	Units	40277334002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.000066 mg/L	5	5	4.9	5.0	98	100	85-115	2	20	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472389
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2705531 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/29/24 01:38	
Arsenic	ug/L	<0.28	1.0	04/29/24 01:38	
Barium	ug/L	<0.70	2.3	04/29/24 01:38	
Beryllium	ug/L	<0.25	1.0	04/29/24 01:38	
Boron	ug/L	<3.0	10.0	04/29/24 01:38	
Cadmium	ug/L	<0.15	1.0	04/29/24 01:38	
Calcium	ug/L	<76.2	254	04/29/24 01:38	
Chromium	ug/L	<1.0	3.4	04/29/24 01:38	
Cobalt	ug/L	<0.12	1.0	04/29/24 01:38	
Lead	ug/L	<0.24	1.0	04/29/24 01:38	
Lithium	ug/L	<0.22	1.0	04/29/24 01:38	
Molybdenum	ug/L	<0.44	1.5	04/29/24 01:38	
Selenium	ug/L	<0.32	1.1	04/29/24 01:38	
Thallium	ug/L	<0.14	1.0	04/29/24 01:38	
Total Hardness by 2340B	mg/L	<0.32	1.7	04/29/24 01:38	

LABORATORY CONTROL SAMPLE: 2705532

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	255	102	80-120	
Arsenic	ug/L	250	257	103	80-120	
Barium	ug/L	250	247	99	80-120	
Beryllium	ug/L	250	255	102	80-120	
Boron	ug/L	250	239	95	80-120	
Cadmium	ug/L	250	259	104	80-120	
Calcium	ug/L	10000	9820	98	80-120	
Chromium	ug/L	250	250	100	80-120	
Cobalt	ug/L	250	254	102	80-120	
Lead	ug/L	250	248	99	80-120	
Lithium	ug/L	250	248	99	80-120	
Molybdenum	ug/L	250	253	101	80-120	
Selenium	ug/L	250	267	107	80-120	
Thallium	ug/L	250	238	95	80-120	
Total Hardness by 2340B	mg/L		65.6			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705533 2705534

Parameter	Units	40276984004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.30	250	250	255	259	102	103	75-125	1	20	
Arsenic	ug/L	6.9	250	250	266	268	104	105	75-125	1	20	
Barium	ug/L	293	250	250	598	603	122	124	75-125	1	20	
Beryllium	ug/L	1.3J	250	250	255	258	101	103	75-125	1	20	
Boron	ug/L	4780	250	250	4890	4930	44	63	75-125	1	20	P6
Cadmium	ug/L	<0.30	250	250	255	258	102	103	75-125	1	20	
Calcium	ug/L	278000	10000	10000	282000	286000	32	75	75-125	2	20	P6
Chromium	ug/L	42.5	250	250	294	301	101	103	75-125	2	20	
Cobalt	ug/L	13.7	250	250	250	256	95	97	75-125	2	20	
Lead	ug/L	12.0	250	250	268	275	102	105	75-125	3	20	
Lithium	ug/L	82.8	250	250	336	340	101	103	75-125	1	20	
Molybdenum	ug/L	2630	250	250	2840	2860	82	91	75-125	1	20	
Selenium	ug/L	0.95J	250	250	270	267	108	107	75-125	1	20	
Thallium	ug/L	0.32J	250	250	255	262	102	105	75-125	3	20	
Total Hardness by 2340B	mg/L	1180			1220	1240				2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472417 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2705612 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	10.0	04/23/24 09:58	

LABORATORY CONTROL SAMPLE: 2705613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	200	198	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705614 2705615

Parameter	Units	40276976001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	44.9	200	200	219	219	87	87	80-120	0	20	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 472469
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 2706042 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/23/24 14:46	

LABORATORY CONTROL SAMPLE: 2706043

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	616	572	93	80-120	

SAMPLE DUPLICATE: 2706044

Parameter	Units	40277009001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	618	610	1	10	

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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch:	472280	Analysis Method:	SM 4500-H+B
QC Batch Method:	SM 4500-H+B	Analysis Description:	4500H+B pH
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40277089001, 40277089002

SAMPLE DUPLICATE: 2705157

Parameter	Units	40276865001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	5	H6

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.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 473315
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: 40277089001, 40277089002

METHOD BLANK: 2710784 Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	05/02/24 19:03	
Fluoride	mg/L	<0.095	0.32	05/02/24 19:03	
Sulfate	mg/L	<0.44	2.0	05/02/24 19:03	

LABORATORY CONTROL SAMPLE: 2710785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.8	109	90-110	
Fluoride	mg/L	2	2.2	108	90-110	
Sulfate	mg/L	20	21.8	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710786 2710787

Parameter	Units	40277088001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	565	1000	1000	1660	1670	110	110	90-110	1	15	
Fluoride	mg/L	<4.8	100	100	95.0	95.8	95	96	90-110	1	15	
Sulfate	mg/L	1130	1000	1000	2300	2210	117	108	90-110	4	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710788 2710789

Parameter	Units	40277096003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.6	20	20	26.1	27.2	107	113	90-110	4	15	M0
Fluoride	mg/L	0.10J	2	2	2.3	2.4	109	115	90-110	5	15	M0
Sulfate	mg/L	13.8	20	20	36.0	36.6	111	114	90-110	2	15	M0

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-301 | **Lab ID: 40277089001** | Collected: 04/17/24 15:20 | Received: 04/19/24 08:05 | 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	**0.252 ± 0.392 (1.00) C:NA T:87%**	pCi/L	05/10/24 13:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.787 ± 0.488 (1.00) C:83% T:84%**	pCi/L	05/02/24 15:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.04 ± 0.880 (2.00)**	pCi/L	05/16/24 15:10	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Sample: MW-84A | **Lab ID: 40277089002** | Collected: 04/17/24 13:50 | Received: 04/19/24 08:05 | 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	**-0.295 ± 0.450 (1.00) C:NA T:90%**	pCi/L	05/10/24 13:49	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.290 ± 0.399 (1.00) C:77% T:84%**	pCi/L	05/02/24 15:58	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.290 ± 0.849 (2.00)**	pCi/L	05/16/24 15:10	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 664159 | Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 | Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 40277089001, 40277089002

METHOD BLANK: 3233909 | Matrix: Water
Associated Lab Samples: 40277089001, 40277089002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.760 ± 0.454 (0.835) C:85% T:72%	pCi/L	05/02/24 15:55	

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

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

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

QC Batch: 664158
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: 40277089001, 40277089002

METHOD BLANK: 3233908 Matrix: Water

Associated Lab Samples: 40277089001, 40277089002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.246 (0.551) C:NA T:85%	pCi/L	05/10/24 13:23	

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

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QUALIFIERS

Project:	25223067 COLUMBIA CCR BACKGROU
Pace Project No.:	40277089

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 - The reported result is an estimated value.

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.

DL - Adjusted Method Detection Limit.

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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.

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.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BACKGROU
Pace Project No.: 40277089

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40277089001	**MW-301**	EPA 3010A	472389	EPA 6020B	472486
40277089002	**MW-84A**	EPA 3010A	472389	EPA 6020B	472486
40277089001	**MW-301**	EPA 7470	473092	EPA 7470	473217
40277089002	**MW-84A**	EPA 7470	473092	EPA 7470	473217
40277089001	**MW-301**				
40277089002	**MW-84A**				
40277089001	**MW-301**	EPA 903.1	664158		
40277089002	**MW-84A**	EPA 903.1	664158		
40277089001	**MW-301**	EPA 904.0	664159		
40277089002	**MW-84A**	EPA 904.0	664159		
40277089001	**MW-301**	Total Radium Calculation	669305		
40277089002	**MW-84A**	Total Radium Calculation	669305		
40277089001	**MW-301**	SM 2320B	472417		
40277089002	**MW-84A**	SM 2320B	472417		
40277089001	**MW-301**	SM 2540C	472469		
40277089002	**MW-84A**	SM 2540C	472469		
40277089001	**MW-301**	SM 4500-H+B	472280		
40277089002	**MW-84A**	SM 4500-H+B	472280		
40277089001	**MW-301**	EPA 300.0	473315		
40277089002	**MW-84A**	EPA 300.0	473315		

Sampler on 4 coolers

40277089

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: 25223067 Columbia CCR Background	Pace Project Manager: dan.milewsky@pacelabs.com,
Requested Due Date:	Project #: 25223067	Pace Profile #:

Regulatory Agency:

State / Location: WI

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

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	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	Hardness	Alkalinity	Residual Chlorine (Y/N)	
																			N	N	N	N	N	N	N		
1	MW-301	WT		4/17	1520														x	x	x	x	x	x	x		001
2	MW-84A	WT		4/17	1350														x	x	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	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Full List Metals = B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li Hg, Mo, Se, Tl ALL SAMPLES UNFILTERED	Bridget Russell	4/18	1120							
	CS Logistics	4/19/24	0805	[illegible]	4/19/24	0805	1.2/1.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: Bridget Russell DATE Signed: 4/18/2024

Client Name: SCS

Sample Preservation Receipt Form

Project # 40277089

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

Lab Lot# of pH paper: 10D0134

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

Initial when completed: mlt

Date/ Time:

Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	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																					X		2.5 / 5
002																										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				mlt 4/11/24																														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

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			

Page 1 of 2

DC#_Title: ENV-FRM-GBAY-0014 v03_SCUR
Effective Date: 8/17/2022

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS　　Project #:

WO#: 40277089

40277089

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 - 120　**Type of Ice:** Wet Blue Dry None　☐ Meltwater Only
Cooler Temperature Uncorr: 1.2.1.1 /Corr: 1.2.1.1
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: 4/19/24 /Initials: MH
Labeled By Initials: PV

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:		8.
For Analysis: ☑ Yes ☐ No　MS/MSD:	☐ Yes ☑ No ☐ N/A	
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:	☑ 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 logi

Page 2 of 2

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

May 24, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 19, 2024. 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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

Pace Analytical Services, LLC
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(920)469-2436

CERTIFICATIONS

Project:	25223067 COLUMBIA CCR MOD-4-6
Pace Project No.:	40277090

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

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40277090001	**MW-309**	Water	04/15/24 15:45	04/19/24 08:05
40277090002	**MW-310**	Water	04/15/24 15:05	04/19/24 08:05
40277090003	**MW-311**	Water	04/15/24 14:25	04/19/24 08:05
40277090004	**FIELD BLANK MOD4**	Water	04/15/24 14:55	04/19/24 08:05

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SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40277090001	**MW-309**	EPA 6020B	TXW	3
			LB	7
		SM 2540C	TXW	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
		EPA 310.2	MT	1
40277090002	**MW-310**	EPA 6020B	TXW	3
			LB	7
		SM 2540C	TXW	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
		EPA 310.2	MT	1
40277090003	**MW-311**	EPA 6020B	TXW	3
			LB	7
		SM 2540C	TXW	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
		EPA 310.2	MT	1
40277090004	**FIELD BLANK MOD4**	EPA 6020B	TXW	3
		SM 2540C	TXW	1
		EPA 9040	HML	1
		EPA 300.0	HMB	3
		EPA 310.2	MT	1

PASI-G = Pace Analytical Services - Green Bay

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Sample: MW-309 **Lab ID: 40277090001** Collected: 04/15/24 15:45 Received: 04/19/24 08:05 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								
Boron	**38.7**	ug/L	10.0	3.0	1	04/22/24 06:49	04/28/24 18:09	7440-42-8	
Calcium	**82600**	ug/L	254	76.2	1	04/22/24 06:49	04/28/24 18:09	7440-70-2	
Total Hardness by 2340B	**366**	mg/L	1.7	0.32	1	04/22/24 06:49	04/28/24 18:09		
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.27**	Std. Units			1		04/15/24 15:45		
Field Specific Conductance	**1620.0**	umhos/cm			1		04/15/24 15:45		
Oxygen, Dissolved	**8.91**	mg/L			1		04/15/24 15:45	7782-44-7	
REDOX	**46.10**	mV			1		04/15/24 15:45		
Turbidity	**4.93**	NTU			1		04/15/24 15:45		
Static Water Level	**782.79**	feet			1		04/15/24 15:45		
Temperature, Water (C)	**12.5**	deg C			1		04/15/24 15:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**948**	mg/L	20.0	8.7	1		04/22/24 14:28		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.4**	Std. Units	0.10	0.010	1		05/02/24 19:04		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**391**	mg/L	40.0	11.8	20		05/03/24 13:00	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 21:41	16984-48-8	
Sulfate	**75.1**	mg/L	40.0	8.9	20		05/03/24 13:00	14808-79-8	
310.2 Alkalinity	Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**309**	mg/L	25.0	7.4	1		04/23/24 14:41		

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(920)469-2436

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Sample: MW-310 **Lab ID: 40277090002** Collected: 04/15/24 15:05 Received: 04/19/24 08:05 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								
Boron	**65.2**	ug/L	10.0	3.0	1	04/22/24 06:49	04/28/24 18:14	7440-42-8	
Calcium	**44600**	ug/L	254	76.2	1	04/22/24 06:49	04/28/24 18:14	7440-70-2	
Total Hardness by 2340B	**279**	mg/L	1.7	0.32	1	04/22/24 06:49	04/28/24 18:14		
Field Data	Analytical Method:								
	Pace Analytical Services - Green Bay								
Field pH	**7.63**	Std. Units			1		04/15/24 15:05		
Field Specific Conductance	**1170.0**	umhos/cm			1		04/15/24 15:05		
Oxygen, Dissolved	**8.83**	mg/L			1		04/15/24 15:05	7782-44-7	
REDOX	**50.80**	mV			1		04/15/24 15:05		
Turbidity	**0.00**	NTU			1		04/15/24 15:05		
Static Water Level	**782.68**	feet			1		04/15/24 15:05		
Temperature, Water (C)	**12.2**	deg C			1		04/15/24 15:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Green Bay								
Total Dissolved Solids	**686**	mg/L	20.0	8.7	1		04/22/24 14:28		
9040 pH	Analytical Method: EPA 9040								
	Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.5**	Std. Units	0.10	0.010	1		05/02/24 19:06		H6
300.0 IC Anions	Analytical Method: EPA 300.0								
	Pace Analytical Services - Green Bay								
Chloride	**175**	mg/L	20.0	5.9	10		05/03/24 13:14	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 21:55	16984-48-8	
Sulfate	**98.9**	mg/L	20.0	4.4	10		05/03/24 13:14	14808-79-8	
310.2 Alkalinity	Analytical Method: EPA 310.2								
	Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**297**	mg/L	25.0	7.4	1		04/23/24 14:42		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Sample: MW-311 **Lab ID: 40277090003** Collected: 04/15/24 14:25 Received: 04/19/24 08:05 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								
Boron	**30.9**	ug/L	10.0	3.0	1	04/22/24 06:49	04/28/24 18:30	7440-42-8	
Calcium	**59900**	ug/L	254	76.2	1	04/22/24 06:49	04/28/24 18:30	7440-70-2	
Total Hardness by 2340B	**285**	mg/L	1.7	0.32	1	04/22/24 06:49	04/28/24 18:30		
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.40**	Std. Units			1		04/15/24 14:25		
Field Specific Conductance	**460.8**	umhos/cm			1		04/15/24 14:25		
Oxygen, Dissolved	**9.42**	mg/L			1		04/15/24 14:25	7782-44-7	
REDOX	**51.50**	mV			1		04/15/24 14:25		
Turbidity	**0.00**	NTU			1		04/15/24 14:25		
Static Water Level	**782.64**	feet			1		04/15/24 14:25		
Temperature, Water (C)	**11.3**	deg C			1		04/15/24 14:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**276**	mg/L	20.0	8.7	1		04/22/24 14:29		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.4**	Std. Units	0.10	0.010	1		05/02/24 19:08		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**2.3**	mg/L	2.0	0.59	1		05/02/24 22:10	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 22:10	16984-48-8	
Sulfate	**10.1**	mg/L	2.0	0.44	1		05/02/24 22:10	14808-79-8	
310.2 Alkalinity	Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**268**	mg/L	25.0	7.4	1		04/23/24 14:43		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Sample: FIELD BLANK MOD4 **Lab ID: 40277090004** Collected: 04/15/24 14:55 Received: 04/19/24 08:05 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								
Boron	**<3.0**	ug/L	10.0	3.0	1	04/22/24 06:49	04/28/24 16:49	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	04/22/24 06:49	04/28/24 16:49	7440-70-2	
Total Hardness by 2340B	**<0.32**	mg/L	1.7	0.32	1	04/22/24 06:49	04/28/24 16:49		
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		04/22/24 14:29		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.5**	Std. Units	0.10	0.010	1		05/02/24 19:16		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.59**	mg/L	2.0	0.59	1		05/02/24 22:24	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/02/24 22:24	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		05/02/24 22:24	14808-79-8	
310.2 Alkalinity	Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay								
Alkalinity, Total as CaCO3	**<7.4**	mg/L	25.0	7.4	1		04/23/24 14:44		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

QC Batch: 472228
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

METHOD BLANK: 2705023 Matrix: Water
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/28/24 16:38	
Calcium	ug/L	<76.2	254	04/28/24 16:38	
Total Hardness by 2340B	mg/L	<0.32	1.7	04/28/24 16:38	

LABORATORY CONTROL SAMPLE: 2705024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	10800	108	80-120	
Total Hardness by 2340B	mg/L		70.5			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705025 2705026

Parameter	Units	40277042001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	131	250	250	391	377	104	98	75-125	4	20	
Calcium	ug/L	24400	10000	10000	33300	34000	90	96	75-125	2	20	
Total Hardness by 2340B	mg/L	165			236	235				0	20	

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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

QC Batch: 472324
Analysis Method: SM 2540C
QC Batch Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

METHOD BLANK: 2705372 Matrix: Water
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/22/24 14:24	

LABORATORY CONTROL SAMPLE: 2705373

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	616	580	94	80-120	

SAMPLE DUPLICATE: 2705374

Parameter	Units	40277090002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	686	688	0	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

QC Batch: 473367 | Analysis Method: EPA 9040
QC Batch Method: EPA 9040 | Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

SAMPLE DUPLICATE: 2711047

Parameter	Units	40277042003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.5	8.5	0	20	H6

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.

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

QC Batch: 473315
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: 40277090001, 40277090002, 40277090003, 40277090004

METHOD BLANK: 2710784 Matrix: Water
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.59	2.0	05/02/24 19:03	
Fluoride	mg/L	<0.095	0.32	05/02/24 19:03	
Sulfate	mg/L	<0.44	2.0	05/02/24 19:03	

LABORATORY CONTROL SAMPLE: 2710785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.8	109	90-110	
Fluoride	mg/L	2	2.2	108	90-110	
Sulfate	mg/L	20	21.8	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710786 2710787

Parameter	Units	40277088001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	565	1000	1000	1660	1670	110	110	90-110	1	15	
Fluoride	mg/L	<4.8	100	100	95.0	95.8	95	96	90-110	1	15	
Sulfate	mg/L	1130	1000	1000	2300	2210	117	108	90-110	4	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2710788 2710789

Parameter	Units	40277096003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.6	20	20	26.1	27.2	107	113	90-110	4	15	M0
Fluoride	mg/L	0.10J	2	2	2.3	2.4	109	115	90-110	5	15	M0
Sulfate	mg/L	13.8	20	20	36.0	36.6	111	114	90-110	2	15	M0

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.

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

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

QC Batch: 472319 | Analysis Method: EPA 310.2
QC Batch Method: EPA 310.2 | Analysis Description: 310.2 Alkalinity
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

METHOD BLANK: 2705335 Matrix: Water
Associated Lab Samples: 40277090001, 40277090002, 40277090003, 40277090004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	04/23/24 14:33	

LABORATORY CONTROL SAMPLE: 2705336

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	99.3	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705337 2705338

Parameter	Units	40277058002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	191	100	100	294	293	103	102	90-110	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705339 2705340

Parameter	Units	40277118020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	660	200	200	869	867	105	104	90-110	0	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project:	25223067 COLUMBIA CCR MOD-4-6
Pace Project No.:	40277090

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 - The reported result is an estimated value.

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.

DL - Adjusted Method Detection Limit.

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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.

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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR MOD-4-6
Pace Project No.: 40277090

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40277090001	**MW-309**	EPA 3010A	472228	EPA 6020B	472330
40277090002	**MW-310**	EPA 3010A	472228	EPA 6020B	472330
40277090003	**MW-311**	EPA 3010A	472228	EPA 6020B	472330
40277090004	**FIELD BLANK MOD4**	EPA 3010A	472228	EPA 6020B	472330
40277090001	**MW-309**				
40277090002	**MW-310**				
40277090003	**MW-311**				
40277090001	**MW-309**	SM 2540C	472324		
40277090002	**MW-310**	SM 2540C	472324		
40277090003	**MW-311**	SM 2540C	472324		
40277090004	**FIELD BLANK MOD4**	SM 2540C	472324		
40277090001	**MW-309**	EPA 9040	473367		
40277090002	**MW-310**	EPA 9040	473367		
40277090003	**MW-311**	EPA 9040	473367		
40277090004	**FIELD BLANK MOD4**	EPA 9040	473367		
40277090001	**MW-309**	EPA 300.0	473315		
40277090002	**MW-310**	EPA 300.0	473315		
40277090003	**MW-311**	EPA 300.0	473315		
40277090004	**FIELD BLANK MOD4**	EPA 300.0	473315		
40277090001	**MW-309**	EPA 310.2	472319		
40277090002	**MW-310**	EPA 310.2	472319		
40277090003	**MW-311**	EPA 310.2	472319		
40277090004	**FIELD BLANK MOD4**	EPA 310.2	472319		

Samples in 4 coolers 40277090

CHAIN-OF-CUSTODY / Analytical Request Document

Pace

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	25223067 Columbia CCR Mod 4-6	Pace Project Manager	dan milewsky@pacelabs com,
Requested Due Date		Project #	25223067	Pace Profile #:	

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): N N N N 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 (B/Ca)	Chloride/Fluoride/Sulfate	TDS and pH	Alkalinity	Hardness	Residual Chlorine (Y/N)	
1		WT																							
2	MW-309	WT		4/15	1545														x	x	x	x	x		001
3	MW-310	WT		4/15	~~1455~~		1505												x	x	x	x	x		002
4	MW-311	WT		4/15	1425														x	x	x	x	x		003
5	FIELD BLANK MOD4	WT		4/15	1455														x	x	x	x	x		004
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
ALL SAMPLES UNFILTERED	Bridget Russell SCS	4/18	1120							
	CS Logistics	4/19/24	0805	[signature]	4/19/24	0805	1.2,1.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Bridget Russell

SIGNATURE of SAMPLER: [signature] DATE Signed: 4/18/2024

Sample Preservation Receipt Form

Client Name: SCS

Project #: 40277090

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

Lab Lot# of pH paper: 10D0134

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

Initial when completed: mlk

Date/ Time:

Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	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)
	Glass							Plastic						Vials						Jars				General										
001									2		1																					X		2.5 / 5
002									2		1																					X		2.5 / 5
003									2		1																					X		2.5 / 5
004									2		1																					X		2.5 / 5
005																																		2.5 / 5
006																																		2.5 / 5
007																																		2.5 / 5
008																																		2.5 / 5
009																																		2.5 / 5
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017																																		2.5 / 5
018																																		2.5 / 5
019																																		2.5 / 5
020																																		2.5 / 5

mlk 4/10/24

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	
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS

Project #:

WO# : 40277090

40277090

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 - 120 Type of Ice: Wet Blue Dry None ☐ Meltwater Only
Cooler Temperature Uncorr: 1.2, 1.1 /Corr: 1.2, 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: 4/19/24 /Initials: mH
Labeled By Initials: EZ

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: Correct Type: Pace Green Bay, Pace IR, Non-Pace	☒Yes ☐No	9.
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. 004 has ID of Fieldblank MOU 4-6 mH 4/19/24
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

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

June 19, 2024

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on June 05, 2024. 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
Natalie Burris, SCS ENGINEERS
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project:	25224067 COLUMBIA CCR MOD 4-6
Pace Project No.:	40279223

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

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

SAMPLE SUMMARY

Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40279223001	**MW-309**	Water	06/04/24 10:30	06/05/24 11:00

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40279223001	**MW-309**		AG1	7
		EPA 300.0	HMB	1

PASI-G = Pace Analytical Services - Green Bay

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Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

Sample: MW-309 **Lab ID: 40279223001** Collected: 06/04/24 10:30 Received: 06/05/24 11:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.55**	Std. Units			1		06/04/24 10:30		
Field Specific Conductance	**2328**	umhos/cm			1		06/04/24 10:30		
Oxygen, Dissolved	**9.20**	mg/L			1		06/04/24 10:30	7782-44-7	
REDOX	**121.6**	mV			1		06/04/24 10:30		
Turbidity	**0.99**	NTU			1		06/04/24 10:30		
Static Water Level	**784.27**	feet			1		06/04/24 10:30		
Temperature, Water (C)	**14.3**	deg C			1		06/04/24 10:30		
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Sulfate	**68.8**	mg/L	10.0	2.2	5		06/14/24 20:23	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: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

QC Batch:	476987	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40279223001

METHOD BLANK: 2732395 Matrix: Water
Associated Lab Samples: 40279223001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<0.44	2.0	06/14/24 19:09	

LABORATORY CONTROL SAMPLE: 2732396

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2732397 2732398

Parameter	Units	40279223001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	68.8	100	100	176	175	108	107	90-110	1	15	

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
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QUALIFIERS

Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

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 - The reported result is an estimated value.

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.

DL - Adjusted Method Detection Limit.

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 - Analyte was not detected and is reported as less than the LOD or as defined by the customer.

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
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25224067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40279223

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40279223001	**MW-309**				
40279223001	**MW-309**	EPA 300.0	476987		

40279223

CHAIN-OF-CUSTODY / Analytical Request Document

Pace

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	25224067 Columbia CCR Mod 4-6	Pace Project Manager:	dan milewsky@pacelabs com,
Requested Due Date		Project #:	25224067	Pace Profile #:	

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): 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	Sulfate	Residual Chlorine (Y/N)	
1																					
2	MW-309	WT				6/4	1030		1	1									X		001
3																					
4																					
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	[signature]	6/4	1500							
	CS Logistics	6/5/24	1100	[signature] Pace	6/5/24	1100	1.0	Y	Y	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Colin Gloede

SIGNATURE of SAMPLER: [signature] DATE Signed: 6/4/24

Sample Preservation Receipt Form

Client Name: SCS Engineers

Project # 40279223

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

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

Initial when completed: Date/ Time:

Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	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)
	Glass							Plastic						Vials						Jars				General										
001									1																									2.5 / 5
002																																		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

6/5/24 GF

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**	
						GN 2	

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #: WO# : 40279223

40279223

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 - 136 **Type of Ice:** Wet Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr. 1.0

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: 11/5/24 /Initials: GP
Labeled By Initials: DG

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: Correct Type: Pace Green Bay, Pace IR, Non-Pace	☑Yes ☐No	9.
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):		

If checked, see attached form for additional comments ☐

Client Notification/ Resolution:

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

Appendix D

Historical Monitoring Results

Single Location
Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 26

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
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
Calcium	ug/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500
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
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
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
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
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310
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
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
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
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
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
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
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
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
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
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
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
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
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	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
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
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
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
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
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
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
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
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
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

Single Location
Name: WPL - Columbia

Location ID: MW-84A
Number of Sampling Dates: 26

Parameter Name	Units	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023	4/17/2024
Boron	ug/L	15.7	10	9.7	14.3	11.1	10.5	12.2	10.3	14	11.9
Calcium	ug/L	72700	77600	69200	69100	75300	75100	78400	68600	65100	73700
Chloride	mg/L	3.7	3.7	4.3	4.4	3.5	5.2	3.4	3	3.1	3.2
Fluoride	mg/L	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.12
Field pH	Std. Units	7.51	7.34	7.49	7.34	7.42	7.34	7.31	7.01	7.51	7.68
Sulfate	mg/L	<2.2	1.5	1.3	1.4	1.3	1.4	1.1	1.3	1.4	1.4
Total Dissolved Solids	mg/L	316	340	320	328	326	334	302	326	324	322
Antimony	ug/L	--	<0.15	<0.15	0.55	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.38	0.34	0.49	0.91	0.41	0.31	0.72	<0.28	<0.28	0.29
Barium	ug/L	14	13.9	12.6	13.4	12.9	13.5	13.7	12.6	12.7	14.4
Beryllium	ug/L	--	<0.25	<0.25	0.47	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	--	<0.15	<0.15	0.53	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	1.6	1.7	1.6	2.6	1.9	2.2	2.2	1.7	1.6	2.1
Cobalt	ug/L	<0.12	<0.12	<0.12	0.52	0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Lead	ug/L	--	<0.24	<0.24	0.55	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.58	0.4	0.39	1	0.28	0.36	0.41	0.71	0.54	0.67
Mercury	ug/L	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.44	<0.44	<0.44	0.62	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.32	<0.32	<0.32	0.48	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	0.66	0.19	<0.14	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.1	0.395	0.39	0.285	0.243	0.611	0.673	0.326	0.844	--
Radium-226	pCi/L	0.1	0.368	0	-0.289	0	0.254	0.267	0	0.292	--
Radium-228	pCi/L	-0.153	0.0273	0.39	0.285	0.243	0.357	0.406	0.326	0.552	--
Field Specific Conductance	umhos/cm	618.4	613.7	610.1	610.9	598.9	600.2	585.2	556.6	599.9	588.1
Oxygen, Dissolved	mg/L	8.43	9.81	9.39	9.8	9.25	9.33	8.31	9.37	8.44	7.82
Field Oxidation Potential	mV	121.5	135	153.2	95.6	89.7	200.6	39.9	103.4	91.2	0
Groundwater Elevation	feet	786.5	787.02	786.1	785.84	784.96	785.02	784.57	786.97	784.39	784.9
Temperature	deg C	10.3	10.6	11.9	10.2	12.5	9.9	11.7	10.7	12.3	11
Turbidity	NTU	1.23	2.15	0	2.45	3.41	0	0	0.72	0.03	0
pH at 25 Degrees C	Std. Units	7.4	7.6	7.6	7.6	7.8	7.6	7.4	7.6	7.6	8.2

Single Location
Name: WPL - Columbia

Location ID: MW-301
Number of Sampling Dates: 25

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
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
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000
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
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	--
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
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
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462
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	--
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
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
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	--
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	--
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
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
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	--
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
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	--
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
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
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
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
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
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
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868
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
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
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
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
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
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

Single Location
Name: WPL - Columbia

Location ID: MW-301
Number of Sampling Dates: 25

Parameter Name	Units	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023	4/17/2024
Boron	ug/L	21.3	28.8	22.2	31.4	28.7	37.5	20.1	36.2	24.9
Calcium	ug/L	112000	93000	117000	67800	97300	62800	120000	52300	102000
Chloride	mg/L	2	3.4	1.5	2.7	1.9	2.3	1.5	2.1	1.6
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	6.73	6.95	6.66	7.01	6.6	6.8	6.65	7.06	7.06
Sulfate	mg/L	11.5	25.1	8.5	17.4	12.7	11.6	12.3	11.8	11.5
Total Dissolved Solids	mg/L	452	412	472	334	422	282	526	300	458
Antimony	ug/L	<0.15	0.33	<0.15	<0.15	0.31	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.33	0.62	<0.28	0.35	0.47	0.3	<0.28	<0.28	<0.28
Barium	ug/L	9.8	9.4	8.9	7.7	7.8	7.5	9.8	7.3	8.1
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.15	0.19	<0.15	<0.15	0.3	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	<0.12	0.29	<0.12	0.34	0.32	0.52	<0.12	0.13	<0.12
Lead	ug/L	<0.24	0.25	<0.24	<0.24	3.1	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.47	0.46	0.58	0.46	0.56	0.37	0.62	0.43	0.63
Mercury	ug/L	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	0.3	<0.14	0.17	0.32	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.193	0.38	1.16	0.172	0.179	0.00292	0.417	0.611	1.04
Radium-226	pCi/L	0	0.0511	0.418	0.172	0	-0.169	0	-0.0576	0.252
Radium-228	pCi/L	0.193	0.329	0.739	-0.0327	0.179	0.00292	0.417	0.611	0.787
Field Specific Conductance	umhos/cm	797	760	857	597.2	747	507.5	857	536	781
Oxygen, Dissolved	mg/L	2	1.22	3.9	0.25	2.47	0.1	6.5	0.16	2.53
Field Oxidation Potential	mV	118.7	183.9	102.9	57.8	207.5	80.9	95.3	23.8	17.9
Groundwater Elevation	feet	787.77	786.53	786.5	785.28	785.44	784.91	787.57	784.67	785.27
Temperature	deg C	8.1	11	7.4	11.1	7.1	10.8	8	10.7	8.6
Turbidity	NTU	0	0	2.41	3.21	0	0	0	0.34	0
pH at 25 Degrees C	Std. Units	7	7.2	6.9	7.3	7	7.1	6.9	7.2	7.9

Single Location
Name: WPL - Columbia

Location ID: MW-309
Number of Sampling Dates: 29

Parameter Name	Units	2/21/2018	3/23/2018	4/23/2018	5/24/2018	6/23/2018	7/23/2018	8/22/2018	9/21/2018	10/22/2018	4/2/2019	10/8/2019	5/29/2020	6/30/2020	8/6/2020	10/8/2020	12/11/2020
Boron	ug/L	31.4	31	30.4	28	26.6	35.5	40.5	30	--	37.4	33.4	54.6	50.7	55.3	57.7	65.9
Calcium	ug/L	42700	41800	39600	52700	67600	63800	93600	55200	--	45300	46900	51600	--	--	65300	--
Chloride	mg/L	147	157	157	141	203	557	811	329	--	145	43.2	350	--	--	575	--
Fluoride	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	--	<0.1	<0.1	<0.095	--	--	<0.095	--
Field pH	Std. Units	7.84	8.08	7.71	7.59	7.5	7.55	7.53	7.83	7.56	7.49	7.75	7.35	7.33	7.72	7.33	7.42
Sulfate	mg/L	12.2	12.2	12	17.5	24.1	33.1	43.3	35.9	--	35.2	21.9	28.6	--	--	21.8	--
Total Dissolved Solids	mg/L	576	552	562	478	548	1210	1570	830	--	548	370	960	--	--	1160	--
Antimony	ug/L	0.28	<0.15	0.36	0.24	0.76	0.31	0.57	<0.15	--	--	--	--	--	--	--	--
Arsenic	ug/L	<0.28	0.35	0.77	<0.28	0.56	0.55	0.46	<0.28	--	--	--	--	--	--	--	--
Barium	ug/L	24.1	22.2	21.3	15.3	18.3	31.2	46.2	22.2	--	--	--	--	--	--	--	--
Beryllium	ug/L	0.21	<0.18	0.2	<0.18	0.38	<0.18	<0.18	<0.18	--	--	--	--	--	--	--	--
Cadmium	ug/L	0.11	<0.081	0.27	<0.081	0.58	0.23	0.3	<0.15	--	--	--	--	--	--	--	--
Chromium	ug/L	2.3	1.9	2.3	1.9	2.2	<1	2.6	1.3	--	--	--	--	--	--	--	--
Cobalt	ug/L	0.5	0.18	0.39	0.11	0.54	0.29	0.35	<0.12	--	--	--	--	--	--	--	--
Lead	ug/L	0.66	<0.2	0.39	<0.2	0.76	0.34	0.39	<0.24	--	--	--	--	--	--	--	--
Lithium	ug/L	1.4	0.88	1.1	0.77	1.1	0.88	1.1	0.76	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	<0.084	--	--	--	--	--	--	--
Molybdenum	ug/L	2.1	2.6	2	<0.44	0.7	0.47	<0.44	<0.44	--	--	--	--	--	--	--	--
Selenium	ug/L	0.39	0.37	0.6	0.41	1.1	0.51	0.39	0.33	--	--	--	--	--	--	--	--
Thallium	ug/L	0.16	<0.14	0.83	<0.14	0.57	0.42	0.38	<0.14	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.516	1.25	1.13	0.895	0.673	1.74	0.754	0.569	--	--	--	--	--	--	--	--
Radium-226	pCi/L	0.486	0.815	0.539	0.0638	-0.208	0.334	0.232	0.569	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.03	0.431	0.595	0.831	0.673	1.41	0.522	-0.304	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	983	1094	985	921	1057	2290	2948	1423	1424	1041	687	1785	1726	1656	2222	2227
Oxygen, Dissolved	mg/L	11.4	6.74	5.43	8.76	9.93	9.27	7.26	10.75	10.23	9.79	11.52	9.83	9.71	9.05	9.4	8.08
Field Oxidation Potential	mV	45.4	123	94.2	54.5	89.9	163.8	106.4	65.5	157.1	120.1	125.2	230.6	65.7	224.2	147.7	112.2
Groundwater Elevation	feet	783.2	783.11	783.07	785.45	786.03	786.27	785.54	787.08	787.99	786.3	787.26	785.98	786.18	785.93	785.47	785.26
Temperature	deg C	10.3	10.6	11	12.1	12	13.3	13.4	12.72	13.3	10.1	13	11	13.3	12.9	12.9	11.8
Turbidity	NTU	4.84	28.88	4.76	3.35	1.94	2.73	2.09	3.18	2.81	1.25	4.89	1.74	3.74	3.56	0	0
pH at 25 Degrees C	Std. Units	7.8	8	7.9	7.6	7.6	7.7	7.8	7.7	--	7.7	7.7	8	--	--	7.7	--

Single Location
Name: WPL - Columbia

Location ID: MW-309
Number of Sampling Dates: 29

Parameter Name	Units	4/13/2021	6/11/2021	10/14/2021	12/21/2021	4/12/2022	10/26/2022	11/30/2022	4/26/2023	6/29/2023	10/9/2023	11/9/2023	4/15/2024	6/4/2024
Boron	ug/L	48	49.9	42.9	36.4	32.5	46.6	49.3	50.8	59.4	41.5	--	38.7	--
Calcium	ug/L	62300	--	83100	--	80200	162000	153000	35500	--	66800	--	82600	--
Chloride	mg/L	390	--	519	--	319	796	--	372	--	259	--	391	--
Fluoride	mg/L	<0.095	--	<0.095	--	<0.095	<0.095	--	<0.095	--	<0.095	--	<0.095	--
Field pH	Std. Units	7.68	7.71	7.64	7.45	7.64	7.23	7.3	7.61	7.72	7.43	7.25	7.27	7.55
Sulfate	mg/L	30.3	--	27.7	--	17.9	28.9	--	143	147	80.6	89	75.1	68.8
Total Dissolved Solids	mg/L	916	--	1110	--	764	1670	--	1250	--	858	--	948	--
Antimony	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Radium-226	pCi/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1804	3072	2079	1382	1420	2591	2746	2073	3282	1553	1330	1620	2328
Oxygen, Dissolved	mg/L	10.14	11.21	9.27	9.33	7.66	8.49	8.97	10.96	9.22	9.9	7.45	8.91	9.2
Field Oxidation Potential	mV	124.1	67.2	85.8	142.9	111.7	41	155.5	107	217.1	87.2	169	46.1	121.6
Groundwater Elevation	feet	784.29	784.2	783.65	782.93	783.14	781.5	781.62	785.05	784.12	782.58	782.76	782.79	784.27
Temperature	deg C	10.7	13.3	13.2	11.17	11.5	12.9	7.7	10.8	13.9	12.5	13.5	12.5	14.3
Turbidity	NTU	2.8	0.1	9.06	2.67	7.83	1.81	0.31	1.9	0	9.11	1.6	4.93	0.99
pH at 25 Degrees C	Std. Units	7.7	--	7.8	--	7.6	7.5	--	7.9	--	7.7	--	8.4	--

Single Location
Name: WPL - Columbia

Location ID: MW-310
Number of Sampling Dates: 26

Parameter Name	Units	2/21/2018	3/23/2018	4/23/2018	5/24/2018	6/23/2018	7/23/2018	8/22/2018	9/21/2018	10/22/2018	4/2/2019	6/12/2019	10/8/2019	12/23/2019	5/29/2020	10/8/2020	12/11/2020
Boron	ug/L	67.1	62.1	60.7	59.2	61.4	69.5	64.2	80.3	--	73	--	81.8	--	74.4	77.6	--
Calcium	ug/L	32400	33400	32100	32100	34300	39700	38800	54100	--	38800	--	57600	55400	41100	62000	56800
Chloride	mg/L	19.8	21.7	22.1	68.6	59.8	118	139	152	--	76	--	190	--	128	310	227
Fluoride	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	--	<0.1	--	<0.095	<0.095	--
Field pH	Std. Units	7.85	8.06	7.75	7.74	7.82	7.81	7.77	7.98	7.7	9.79	7.82	7.82	7.7	7.54	7.52	7.62
Sulfate	mg/L	31.6	33.1	32	28	30.4	60.2	32.8	118	--	58.4	--	85.9	--	68.2	60	--
Total Dissolved Solids	mg/L	406	398	396	436	438	532	526	736	--	470	--	650	--	582	846	700
Antimony	ug/L	0.15	<0.15	0.3	0.21	0.97	0.42	0.17	0.49	--	--	--	--	--	--	--	--
Arsenic	ug/L	<0.28	0.42	0.82	0.45	1.2	0.66	0.43	0.76	--	--	--	--	--	--	--	--
Barium	ug/L	19.8	19.5	19	20.7	20.3	21.2	21	26.1	--	--	--	--	--	--	--	--
Beryllium	ug/L	<0.18	<0.18	0.72	<0.18	0.59	0.29	<0.18	<0.18	--	--	--	--	--	--	--	--
Cadmium	ug/L	<0.081	<0.081	0.14	0.11	0.78	0.31	<0.15	0.17	--	--	--	--	--	--	--	--
Chromium	ug/L	1.1	1.2	1.4	1.4	2.4	<1	1.3	<1	--	--	--	--	--	--	--	--
Cobalt	ug/L	0.18	0.13	0.26	0.15	0.75	0.32	0.13	0.24	--	--	--	--	--	--	--	--
Lead	ug/L	<0.2	<0.2	0.21	<0.2	0.77	0.45	<0.24	0.25	--	--	--	--	--	--	--	--
Lithium	ug/L	1	0.85	1.4	0.81	1.2	1.2	0.92	1.1	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	<0.084	--	--	--	--	--	--	--
Molybdenum	ug/L	2.3	3.6	2.8	1.9	1.9	1.7	1.2	4.8	--	--	--	--	--	--	--	--
Selenium	ug/L	<0.32	<0.32	0.55	<0.32	0.96	0.75	<0.32	1.4	--	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	0.73	<0.14	0.9	0.44	<0.14	0.27	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.114	0.709	0.969	0.346	0.12	0.257	0.308	0.475	--	--	--	--	--	--	--	--
Radium-226	pCi/L	-0.053	0.423	-0.261	-0.115	0.12	0.0705	0.247	0.285	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.114	0.286	0.969	0.346	-0.00299	0.186	0.0614	0.19	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	684	765	688	840	791	998	1016	1114	1182	924	--	1226	1416	1035	1481	1212
Oxygen, Dissolved	mg/L	11.02	5.83	2.87	8.85	10.09	8.32	3.43	10.49	10.27	7.86	--	11.57	9.65	10.07	9.63	8.3
Field Oxidation Potential	mV	25	64.2	68.2	63.5	74.5	165.7	137	51.5	145	119	--	139.4	40	207.8	150.4	111.5
Groundwater Elevation	feet	783.05	783.1	782.97	785.97	786.64	786.35	785.4	787.24	788.18	786.38	--	787.94	775.22	785.81	785.56	785.26
Temperature	deg C	11.04	11.2	11.2	11.7	12	13.2	13.4	13.52	13.6	10.5	--	13.4	12.4	11.5	13.2	12.5
Turbidity	NTU	0.94	1.7	1.35	0.04	1.12	0.41	0.32	3.99	5.53	1.13	--	2.66	2.06	1.96	0	0
pH at 25 Degrees C	Std. Units	7.8	7.8	7.9	7.8	7.8	7.8	7.9	7.6	--	7.8	--	7.8	--	8	7.8	--

Single Location
Name: WPL - Columbia

Location ID: MW-310
Number of Sampling Dates: 26

Parameter Name	Units	4/13/2021	6/11/2021	10/14/2021	4/12/2022	10/26/2022	11/30/2022	4/26/2023	8/31/2023	10/9/2023	4/15/2024
Boron	ug/L	69.6	--	72	72	71.3	--	57.5	--	65.6	65.2
Calcium	ug/L	49300	--	38900	31900	68900	55500	36800	--	37500	44600
Chloride	mg/L	227	220	84.6	35.2	323	215	128	--	71.3	175
Fluoride	mg/L	<0.095	--	<0.095	<0.095	<0.095	--	<0.095	--	<0.095	<0.095
Field pH	Std. Units	7.73	7.73	7.7	7.74	7.61	7.67	7.27	7.75	7.7	7.63
Sulfate	mg/L	43.3	--	54.3	39.8	32.8	--	102	--	90.7	98.9
Total Dissolved Solids	mg/L	654	--	498	416	750	--	654	--	554	686
Antimony	ug/L	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--	--	--
Radium-226	pCi/L	--	--	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1194	1192	884	711	1	1200	1040	1064	949	1170
Oxygen, Dissolved	mg/L	9.93	11.21	9.29	10.03	8.66	9.46	11.38	11.24	10.05	8.83
Field Oxidation Potential	mV	106	55.6	85.2	200.5	31.3	146.5	112.6	184.6	106.6	50.8
Groundwater Elevation	feet	784.24	784.05	783.48	783.19	780.96	781.14	785.18	782.47	782.32	782.68
Temperature	deg C	10.8	12.8	13.4	10.6	13	10.8	10.8	13.4	13.1	12.2
Turbidity	NTU	0.57	0.67	3.16	1.17	1.58	0.51	2.25	0	2.32	0
pH at 25 Degrees C	Std. Units	7.8	--	8	7.9	7.7	--	7.8	--	7.9	8.5

Single Location
Name: WPL - Columbia

Location ID: MW-311
Number of Sampling Dates: 20

Parameter Name	Units	2/21/2018	3/23/2018	4/23/2018	5/24/2018	6/23/2018	7/23/2018	8/22/2018	9/21/2018	10/22/2018	4/2/2019	10/8/2019	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/12/2022
Boron	ug/L	43.7	42.7	40.1	31.7	33.6	30.1	32.4	27.5	--	35.7	33.5	25.7	26.2	33.6	31.7	32.7
Calcium	ug/L	58000	61000	56600	62500	70700	76800	65700	75400	--	65600	63900	62200	73400	59000	61000	61800
Chloride	mg/L	2.9	2.7	2.6	3.5	3	2	2	3.9	--	1.9	1.5	1.5	1.4	1.3	1.3	1
Fluoride	mg/L	<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
Field pH	Std. Units	7.72	7.93	7.62	7.54	7.65	7.59	7.6	7.95	7.5	7.51	7.69	7.37	7.66	7.46	7.45	8
Sulfate	mg/L	7.1	7.2	7.9	36.9	72.3	84.7	53.6	92.4	--	23.1	21.2	39.1	72.1	15.6	14.2	8.9
Total Dissolved Solids	mg/L	260	274	262	304	352	372	332	424	--	276	272	326	380	270	276	278
Antimony	ug/L	0.15	<0.15	<0.15	<0.15	0.18	<0.15	0.43	<0.15	--	--	--	--	--	--	--	--
Arsenic	ug/L	<0.28	0.56	0.42	0.32	0.31	0.46	0.56	0.56	--	--	--	--	--	--	--	--
Barium	ug/L	13.3	12.3	12.4	10.7	15.4	16.3	14.2	18.2	--	--	--	--	--	--	--	--
Beryllium	ug/L	<0.18	<0.18	<0.18	<0.18	<0.18	<0.18	0.19	<0.18	--	--	--	--	--	--	--	--
Cadmium	ug/L	<0.081	<0.081	<0.081	<0.081	<0.081	<0.081	0.29	<0.15	--	--	--	--	--	--	--	--
Chromium	ug/L	2.1	2.2	2.2	2.2	2.3	1.3	2.3	1.5	--	--	--	--	--	--	--	--
Cobalt	ug/L	0.24	0.11	<0.085	0.11	0.11	0.12	0.35	<0.12	--	--	--	--	--	--	--	--
Lead	ug/L	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.24	--	--	--	--	--	--	--	--
Lithium	ug/L	0.75	0.62	0.58	0.52	0.72	0.67	0.83	0.82	--	--	--	--	--	--	--	--
Mercury	ug/L	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.084	<0.084	--	--	--	--	--	--	--
Molybdenum	ug/L	2.1	1.9	2.1	0.55	0.93	0.56	0.74	2.5	--	--	--	--	--	--	--	--
Selenium	ug/L	0.83	0.78	0.6	0.9	0.86	0.62	0.93	1.2	--	--	--	--	--	--	--	--
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.3	<0.14	--	--	--	--	--	--	--	--
Total Radium	pCi/L	0.608	1.14	0.898	0.162	0.0331	0.338	0.0614	0.773	--	--	--	--	--	--	--	--
Radium-226	pCi/L	0.205	0.569	0.502	0	-0.058	0.338	0.0614	0.424	--	--	--	--	--	--	--	--
Radium-228	pCi/L	0.403	0.571	0.396	0.162	0.0331	-0.0845	-0.253	0.349	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	455	508.1	459.1	539	596	606.8	573.2	600	699	337.8	495.6	547.2	606.1	500.2	493.5	482
Oxygen, Dissolved	mg/L	11.74	4.77	0.87	8.91	9.75	7.91	1.97	10.31	9.96	9.77	11.68	10.64	9.38	10.23	9.42	7.74
Field Oxidation Potential	mV	31	74	65.3	70.1	82.6	157	150.3	42.4	146	116.3	144.3	176.3	137.1	110.4	90.7	110.2
Groundwater Elevation	feet	783.02	783	781.83	786.11	786.47	786.55	785.46	787.66	788.64	786.38	787.64	785.85	785.83	784.15	783.48	783.04
Temperature	deg C	10.3	10.5	10.5	11	11	12.1	12.6	13.07	13.4	9.7	12.9	10.5	12.7	9.5	12.8	11.1
Turbidity	NTU	2.56	9.12	2.58	0.59	0.58	1.13	0.65	10.3	3.73	2.91	8.56	4.7	0.7	3.49	4.26	2.5
pH at 25 Degrees C	Std. Units	7.7	7.9	7.7	7.6	7.7	7.6	7.7	7.6	--	7.6	7.6	7.7	7.7	7.7	7.9	7.7

Single Location
Name: WPL - Columbia

Location ID: MW-311
Number of Sampling Dates: 20

Parameter Name	Units	10/27/2022	4/26/2023	10/9/2023	4/15/2024
Boron	ug/L	34.2	23	31	30.9
Calcium	ug/L	66300	52800	60900	59900
Chloride	mg/L	1.2	2.1	2	2.3
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	7.5	7.48	7.46	7.4
Sulfate	mg/L	15.5	22.2	10.8	10.1
Total Dissolved Solids	mg/L	268	292	270	276
Antimony	ug/L	--	--	--	--
Arsenic	ug/L	--	--	--	--
Barium	ug/L	--	--	--	--
Beryllium	ug/L	--	--	--	--
Cadmium	ug/L	--	--	--	--
Chromium	ug/L	--	--	--	--
Cobalt	ug/L	--	--	--	--
Lead	ug/L	--	--	--	--
Lithium	ug/L	--	--	--	--
Mercury	ug/L	--	--	--	--
Molybdenum	ug/L	--	--	--	--
Selenium	ug/L	--	--	--	--
Thallium	ug/L	--	--	--	--
Total Radium	pCi/L	--	--	--	--
Radium-226	pCi/L	--	--	--	--
Radium-228	pCi/L	--	--	--	--
Field Specific Conductance	umhos/cm	487	484.7	493.4	460.8
Oxygen, Dissolved	mg/L	8.92	10.58	10.48	9.42
Field Oxidation Potential	mV	34.5	118.4	-101.8	51.5
Groundwater Elevation	feet	781.23	785.69	782.22	782.64
Temperature	deg C	11.9	9.8	12.3	11.3
Turbidity	NTU	0	0.39	0.31	0
pH at 25 Degrees C	Std. Units	7.6	7.7	7.7	8.4

Appendix E

Alternative Source Demonstrations

E1 October 2023 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration
October 2023 Detection Monitoring

Dry Ash Disposal Facility, Modules 4-6
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25224067.00 | May 10, 2024

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PE CERTIFICATION

I, Sherren Clark, hereby certify that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Columbia Energy Center Dry Ash Disposal Facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

5-10-2024

(signature) (date)

Sherren Clark

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2024.

Pages or sheets covered by this seal:
Alternative Source Demonstration, October 2023 Detection Monitoring, Dry Ash Disposal Facility, Modules 4-6 Columbia Energy Center, Pardeeville, Wisconsin (Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

This ASD also provides the results for the October 2023 sampling event and a supplemental resampling event completed in November 2023.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSI sulfate observed in the statistical evaluation of the October 2023 detection monitoring event and the November 2023 resampling event at the Columbia Energy Center (COL) Dry Ash Disposal Facility, Modules 4-6 CCR Unit (Mod 4-6).

1.2 SITE INFORMATION AND MAP

The COL site is located at W8375 Murray Road, Pardeeville, Columbia County, Wisconsin (**Figure 1**). The COL site is an active coal-burning generating station, which has been burning coal and disposing of CCR on site since the mid-1970s. The layout of the site is shown on **Figure 2**. The COL property includes two areas of CCR storage and disposal. These are the Dry Ash Disposal Facility (ADF) and the Ash Ponds Facility. This ASD evaluates the conditions at the site for Mod 4-6 of the ADF only. The Module 4 CCR Unit became operational in 2018. Modules 5 and 6 were constructed in 2021 and began receiving waste in 2022. The monitoring network certification was updated to include Modules 5 and 6 on December 9, 2021, and the CCR Unit was subsequently referred to as Mod 4-6. The ADF is operated under the Wisconsin Department of Natural Resources (WDNR) License No. 3025.

The groundwater monitoring system at the COL Mod 4-6 facility monitors a single CCR Unit:

- COL Dry Ash Disposal Facility – Modules 4-6

A map showing the CCR Unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided on **Figure 2.** Separate monitoring systems have been established for the other CCR Units at COL, which include Modules 1-3 of the COL ADF, Modules 10-11 of the COL ADF, the Primary Ash Pond, and the Secondary Ash Pond.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

The statistical evaluation was completed in accordance with 40 CFR 257.93(f)(3) using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the Upper Prediction Limit (UPL) to evaluate whether an SSI has occurred. The evaluation was based on an intrawell UPL with 1-of-2 retesting, calculated using Sanitas software. The retesting approach results in a slightly lower UPL, but only 1 of 2 samples collected for the event (original and retest) must meet the UPL to demonstrate compliance. The intrawell UPLs, the October 2023 sampling results, and the November 2023 resampling results are summarized in the attached **Table 1.**

The October 2023 SSIs include the following parameter and well:

- Sulfate: MW-309

Concentration trends for the parameters with SSIs are shown in **Appendix A.**

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

Historical monitoring results from background and compliance sampling for the CCR Rule constituent results with an SSI are provided in **Table 2.** The laboratory reports for the October 2023 detection monitoring event and November 2023 resampling event will be included in the 2024 Annual Groundwater Monitoring and Corrective Action Report to be submitted in January 2025. Complete laboratory reports for the background monitoring events and the previous detection monitoring events were included in previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

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 ADF. Immediately underlying the surficial sand and gravel aquifer is the Cambrian-Ordovician sandstone aquifer.

Additional details on the regional geology and hydrogeology were provided in the May 2020 ASD (SCS Engineers [SCS], 2020).

2.1.2 Site Information and Groundwater Flow

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 ADF were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn Engineering, Inc. [Warzyn], 1978). During drilling of CCR well MW-301, the unconsolidated materials were identified as consisting primarily of silty sand. The boring log for previously installed monitoring well MW-84A shows silty sand and sand as the primary unconsolidated materials at these locations. CCR monitoring wells MW-84A and MW-301 are screened within the unconsolidated sand unit. The geology in the vicinity of wells MW-309, MW-310, and MW-311 is a poorly graded sand and gravel.

Shallow groundwater at the site generally flows to the northwest across the existing landfill area, then generally flows west toward the Wisconsin River. A groundwater flow map for October 2023 is shown on **Figure 3.** The groundwater elevation data for the state and CCR monitoring program wells are provided in **Table 3**. A time series plot of groundwater elevations at the Mod 4-6 wells is provided in **Appendix A.**

Historically, localized groundwater mounding was associated with the ash ponds; however, flow in the ash ponds area changed in 2022 and 2023 as the ponds were closed and CCR was removed. In 2022, dewatering wells located around the Secondary Ash Pond lowered the water table near the Secondary Ash Pond and discharged groundwater to the Primary Ash Pond. Beginning in spring 2023, dewatering activities switched to the Primary Ash Pond area, and groundwater pumped from dewatering wells around the Primary Ash Pond was discharged to the large cooling pond south of the generating station. The October 2023 groundwater flow map shows flow toward the east end of the Primary Pond, which may reflect the recently terminated dewatering activities, and flow to the west from the west end of the Primary Pond. Groundwater dewatering in the Primary Ash Pond was completed shortly before the October 2023 sampling event. For comparison, the April 2022, October 2022, and April 2023 water table maps are provided in **Appendix B.**

Dewatering for ash pond closures affected water levels and groundwater flow directions in the Mod 4-6 area, as shown on the water table maps (**Figure 3** and **Appendix B**) and the time series plot of groundwater elevation (**Appendix A**).

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-301 and MW-84A. The downgradient wells include MW-309, MW-310, and MW-311. The background wells are shared with the other COL CCR Units. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 36 to 38 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Additional groundwater monitoring wells currently exist at COL as part of the monitoring systems developed for the state monitoring program and for the other CCR Units.

Monitoring wells for the state monitoring program are installed in the unconsolidated sand and gravel unit, which is the uppermost aquifer as defined under 40 CFR 257.53. This shallow monitoring system includes water table wells and mid-depth piezometers. Well depths range from approximately 14 to 76 feet, measured from the top of the well casing.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR Unit, SCS used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. **Section 4.0** of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS

Field notes and sampling results were reviewed to determine if any sampling error may have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers.

SCS collected samples on October 9 and 11, 2023. Retest samples were collected on November 7, 2023. Field parameter results were compiled by SCS and provided to the laboratory for inclusion in the laboratory report. SCS did not identify issues with the sample collection based on review of the data and field notes.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2023 detection monitoring event and the November 2023 resampling event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results.

Based on the review of the laboratory reports, SCS did not identify any laboratory quality control flags or issues in the laboratory reports that affect the usability of the data for detection monitoring.

A time series plot of the sulfate analytical data was also reviewed for any anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plot is provided in **Appendix A**. The sulfate concentrations observed are within the range of historical concentrations for the COL ADF as a whole and no anomalous results were identified.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSI

Based on the October 2023 sampling results and the November 2023 retest results, an SSI for sulfate occurred for MW-309 for the October 2023 semiannual event.

Based on the review of the statistical evaluation, SCS did not identify any errors in the statistical evaluation that caused or contributed to the determination of intrawell SSI for sulfate at MW-309. However, the small size of the intrawell background data set (eight samples per well) and the short timeframe over which they were collected (8 months) may have contributed to the identification of the October 2023 result as SSIs. The small background data set collected from February through September 2018 likely does not represent the full range of variability in background concentrations at the compliance monitoring wells. The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. EPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses; however, newer data with SSIs cannot be added to the background data set unless and until the newer data has been confirmed to represent background variability and not a release from the CCR unit.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2023 monitoring event based on the methodology and analysis review, and no errors or issues caused or contributed to the reported SSIs.

4.0 ALTERNATIVE SOURCES

This section discusses the potential alternative sources for the sulfate SSI at the downgradient monitoring well MW-309; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an intrawell approach, comparing the October 2023 detection monitoring results to the UPLs calculated based on background sampling of the compliance wells (MW-309, MW-310, and MW-311). If concentrations of a constituent that is naturally present in the aquifer vary with time, then the potential exists that the compliance sampling concentrations may be higher than background concentrations due to natural temporal variation.

Temporal variation can occur seasonally or due to longer-term events such as changes in infiltration patterns and groundwater flow directions caused by wet or dry years.

Background sampling at the three Mod 4-6 compliance wells was performed prior to disposal of CCR in Mod 4-6. Because the background sampling at the three compliance wells was performed after other potential man-made sources of sulfate had been in operation for many years, it is difficult to determine how much of the variation in sulfate concentrations is due to natural sources versus man-made alternative sources associated with the long-term use of the property, as discussed in **Section 4.1.2**. Based on comparison to the two upgradient wells, it appears likely that sulfate may reflect man-made sources. Regardless of the source, natural temporal variations in infiltration and groundwater flow direction may have contributed to the SSI for sulfate at MW-309.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the sulfate SSIs could include the closed ash pond landfill, the active and inactive ash ponds (currently in the closure process), the surface water/leachate collection pond for the ADF, the former ash pond effluent ditch, the coal storage area, railroad operations, road salt use, storm water runoff from the plant entrance road and/or other plant operations.

Historically, groundwater flow directions have varied significantly at the site due to changes in water and ash management, making it difficult to identify a specific source for low levels of sulfate in the area of the Mod 4-6 compliance monitoring wells. Furthermore, recent dewatering activities around the Secondary Ash Pond (2022) and the Primary Ash Pond (2023) likely also affected groundwater flow, further complicating the evaluation of historic sources. Nevertheless, there are several lines of evidence indicating that the October 2023 SSI for sulfate are not due to a release from the Mod 4-6 CCR unit.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSI for sulfate in compliance well MW-309 relative to the intrawell background sampling, are due to one or more alternative sources including:

1. The Mod 4-6 CCR Unit was constructed with a composite liner system and leachate collection system. Module 4 has only been receiving CCR since late 2018, and Modules 5 and 6 started receiving CCR in 2022; therefore, it is very unlikely that a release from Mod 4-6 could have reached MW-309 by October 2023. More information about the composite liner is presented in **Section 4.2.1**.

2. The sulfate concentrations at MW-309 in October and November 2023 were within the range of background results observed at adjacent well MW-310. More information on background concentrations for sulfate is provided in **Section 4.2.2**.

3. The concentration of sulfate dropped significantly in the results from the October 2023 sampling event following the increases in April 2023. This short-term increase and decrease is not an expected behavior in response to a release through the composite liner. More information about the concentration changes with time is presented in **Section 4.2.3**.

4. Higher temporal variability in 2022 and 2023 is expected in these wells because active groundwater pumping for dewatering in the ash pond area likely induced changes in groundwater levels and flow patterns. The influence of dewatering is discussed in **Section 4.2.4**.

5. Because of their shallow depth and location near the plant entrance road, influences from surface water infiltration, precipitation, or dissolution of sulfate impurities in rock salt (a deicing material) may be accentuated in these wells. These factors contribute to temporal variability. For

sulfate impurities in rock salt, the expected manifestation would be as a sharp increase in sulfate in the spring followed by a decrease in the fall, as discussed in **Section 4.2.5**.

6. As discussed in **Section 3.3**, the small background data set was collected over a short period of time from February through September 2018, and likely does not represent the full range of temporal variability in background concentrations at the compliance monitoring wells.

These lines of evidence and the supporting data are discussed in more detail in the following sections.

4.2.1 Mod 4-6 Composite Liner

The Mod 4-6 CCR Unit was constructed with a composite liner system and a leachate collection system, and has only been receiving CCR since late 2018 in Module 4 and since 2022 in Modules 5 and 6. Given the short active timeframe, it is very unlikely that a release from Mod 4-6 could have reached MW-309 by October 2023. The liner system includes the following:

- 2 feet of compacted clay
- Geosynthetic clay liner (GCL)
- 60-mil high density polyethylene (HDPE) geomembrane
- Leachate collection drainage layer
- Leachate collection piping

The Module 4 liner was constructed in 2018, and CCR placement in Module 4 began in November 2018. CCR placement in Modules 5 and 6 began in 2022.

Given the liner system in place, a release from Mod 4-6 would have to penetrate the HDPE liner at a flaw, flow vertically through the GCL and compacted clay liner, and travel with the groundwater approximately 600 feet north to MW-309 from Module 4 in less than 5 years, or travel to the wells from Modules 5 and 6 in 1 year. Based on the hydraulic conductivity of the liner clay (10^{-8} centimeters/second), the lack of any evidence of a flaw in the HDPE liner, and the very low estimated average groundwater velocity (0.2 to 4 feet per year [SCS, 2021a]), it is very unlikely that changes in sulfate concentrations at MW-309 reflect a release from Mod 4-6. Extensive testing was performed as part of the WDNR-approved construction documentation (SCS, 2021b) to document the proper construction of the liner.

4.2.2 Area Background Concentrations for Sulfate

For sulfate, the April and June 2023 concentrations at MW-309 exceeded the intrawell UPLs for all three compliance wells, but the October 2023 and November 2023 results for sulfate at MW-309 were within the range of background concentrations for nearby well MW-310. The October and November results indicate that the sulfate concentration has returned to the range observed for wells along the entrance road prior to CCR disposal in Mod 4-6 after a short-term increase above that range.

4.2.3 Sulfate Concentration Changes with Time

The concentrations of sulfate dropped significantly in the results of the recent October 2023 sampling event, following the increases in April 2023. This short-term increase and decrease are not an expected behavior in response to a release through the composite liner.

The historical sulfate concentrations from all five Mod 4-6 wells are shown in **Table 2** and on the time series plots in **Appendix A.**

4.2.4 Influence of Dewatering Well Pumping

Higher temporal variability in 2022 and 2023 is expected in these wells because active groundwater pumping for dewatering in the ash pond area likely induced changes in groundwater levels and flow patterns. In 2022, dewatering wells were installed around the Secondary Pond, and groundwater was pumped to lower the water table below the pond to facilitate CCR removal and pond closure. Pumped groundwater was discharged to the Primary Ash Pond. In 2023, groundwater was pumped from dewatering wells installed around the Primary Ash Pond to lower the water table below the pond to facilitate CCR removal and pond closure. The pumped groundwater was discharged to the large cooling pond south of the generating station.

The October 2023 groundwater flow map (**Figure 3**) shows flow toward the east end of the Primary Pond, which may reflect the recently terminated dewatering activities, and flow to the west from the west end of the Primary Pond. The dewatering activities at the Primary Ash Pond were completed in September 2023, and excavation of CCR material from the Primary Ash Pond was completed the week prior to water level measurements for the October 2023 sampling event. For comparison, the April 2022, October 2022, and April 2023 water table maps are provided in **Appendix B.**

The April 2022 water table map shows radial flow away from the Primary Ash Pond and flow to the northwest in the Mod 4-6 area. The October 2022 water table map shows the influence of dewatering around the Secondary Pond. The April 2023 water table map shows the influence of initial dewatering around the Primary Ash Pond, and potentially some residual effects of the 2022 dewatering around the Secondary Pond. All three maps continue to show flow being generally to the north and/or northwest in Mod 4-6, but hydraulic gradients and flow paths likely varied locally as dewatering was started and stopped at different locations.

The time series plot of groundwater elevations (**Appendix A**) also shows the influence of dewatering activities. The plot shows water levels at the two upgradient background wells, located further from the pond closure area, and the three compliance wells, located closer to the pond closure area. From the time Module 4 began accepting CCR in late 2018, water levels at all five wells followed a generally decreasing trend through 2022, with a much steeper decrease between April 2022 and October 2022, when the Secondary Pond dewatering wells were active. Water levels at the compliance wells increased after dewatering at the Secondary Pond ended in late 2022, and all wells showed increased water levels in spring 2023 due to precipitation and infiltration.

The variability in water levels and flow directions associated with the dewatering activities likely contributed to temporal variability in sulfate concentrations at MW-309. Conditions during 2022 and 2023 were variable and were not the same as those during the short background monitoring period used to develop the intrawell UPLs.

4.2.5 Surface Water Infiltration Effects

Because of their shallow depth and location near the plant entrance road, influences from surface water infiltration, precipitation, or dissolution of sulfate impurities in rock salt (a deicing material) may be accentuated in the Mod 4-6 compliance wells. These factors contribute to temporal variability.

The influence of surface water infiltration and road salt impacts is apparent in the chloride monitoring results for MW-309 and MW-310. During background monitoring, prior to CCR disposal in

Mod 4-6, MW-309 had chloride concentrations ranging from 141 to 811 milligrams per liter (mg/L), and concentrations since then have been highly variable but below the intrawell UPL.

Wells MW-309, MW-310, and MW-311 are shallow wells that are also located close to an access road. Due to this location, influence from atmospheric deposition, precipitation, or the dissolution of sulfate from rock salt during deicing of roads, it may be likely a sharp increase in sulfate will be seen in the spring followed by a sharp decrease in the fall.

While chloride provides the strongest indication of impacts from surface water infiltration, concentrations of other parameters can also vary to the surface water impacts. Sulfate can be present as an impurity in rock salt used for deicing. Surface water infiltration can also affect seasonal water levels and local flow directions.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSI reported for sulfate at MW-309 demonstrate that the SSIs are likely due to sources other than the Mod 4-6 CCR Unit.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the COL Mod 4-6 CCR Unit may continue with detection monitoring based on this ASD. The ASD report will be included in the 2024 Annual Report due January 31, 2025.

7.0 REFERENCES

RMT, 2003, Water Table Map (April 2023), Figure 3.

SCS Engineers (SCS), 2023, Alternative Source Demonstration, October 2022 Detection Monitoring, Dry Ash Disposal Facility, Modules 4-6, Columbia Energy Center, Pardeeville, WI, May 31, 2023.

SCS, 2020, Alternative Source Demonstration, May 2020 Detection Monitoring, Dry Ash Disposal Facility, Module 4, Columbia Energy Center, Pardeeville, WI, November 12, 2020.

SCS, 2021a, 2020 Annual Groundwater Monitoring and Corrective Action Report, Columbia Energy Center, Dry Ash Disposal Facility, Module 4, Pardeeville, WI, January 29, 2021.

SCS, 2021b. Phase 1, Modules 5 and 6 Construction Documentation Report, Columbia Energy Center, Dry Ash Disposal Facility, Pardeeville, WI, December 2, 2021.

U.S. EPA, 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

U.S. EPA, 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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.

Warzyn Engineering, Inc., 1981, Water Table Contour Map 2/4/81, Drawing No. C7134-94.

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Tables

Table 1. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Module 4-6 / SCS Engineers Project #25224067.00

	Background Wells		Compliance Wells						
Parameter Name	**MW-84A**	**MW-301**	**MW-309**			**MW-310**		**MW-311**	
	10/11/2023	10/11/2023	**Intrawell UPL**	10/9/2023	11/7/2023	**Intrawell UPL**	10/9/2023	**Intrawell UPL**	10/9/2023
Groundwater Elevation, ft amsl	784.39	784.67		782.58	782.76		782.32		782.22
Appendix III									
Boron, µg/L	14.0	36.2	42.2	41.5	--	81.9	65.6	49.8	31.0
Calcium, µg/L	65,100	52,300	99,900	66,800	--	56,000	37,500	84,200	60,900
Chloride, mg/L	3.1	2.1	901	259	--	205	71.3	4.41	2.0 J
Fluoride, mg/L	<0.095	<0.095 M0	DQ	<0.095	--	DQ	<0.095 M	DQ	<0.095 M0
Field pH, Std. Units	7.51	7.06	8.18	7.43	7.25	8.12	7.70	8.07	7.46
Sulfate, mg/L	1.4 J	11.8	53.1	80.6	89.0	118	90.7	131	10.8
Total Dissolved Solids, mg/L	324	300	1,730	858	--	759	554	462	270

4.4 — Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:
UPL = Upper Prediction Limit
DQ = Double Quantification
-- = Not Analyzed
LOQ = Limit of Quantitation
LOD = Limit of Detection
mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase

Lab Notes:
J = Estimated concentration at or above the LOD and below the LOQ.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Notes:
1. Intrawell UPLs are based on 1-of-2 retesting approach; therefore, there is no SSI if either the original sample result or the resample are below the UPL.
2. Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.
3. Intrawell UPLs were calculated from background sampling results for the compliance wells from February 2018 through September 2018.

Created by: NDK Date: 12/2/2022
Last revision by: RM Date: 11/7/2023
Checked by: NLB Date: 11/14/2023
Scientist/PM QA/QC: TK Date: 1/9/2024

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Background	MW-301	12/22/2015	9.3
		4/5/2016	15.3
		7/8/2016	15
		10/13/2016	13.9
		12/29/2016	12.3 J
		1/25/2017	6.5
		4/11/2017	10.3
		6/6/2017	17.1
		8/8/2017	31.6
		10/23/2017	27.5
		4/25/2018	8.6
		8/8/2018	21.6
		10/24/2018	19.2
		4/2/2019	4.4
		10/9/2019	8.4
		2/3/2020	7.2
		5/29/2020	11.5
		10/8/2020	25.1
		4/14/2021	8.5
		10/14/2021	17.4
		4/13/2022	12.7
		10/27/2022	11.6
		4/27/2023	12.3
		10/11/2023	11.8
	MW-84A	12/22/2015	4.9
		4/5/2016	4.3
		7/8/2016	3.7 J
		10/13/2016	2.6 J
		12/29/2016	2.7 J
		1/25/2017	3
		4/11/2017	2.8 J
		6/6/2017	2.7 J
		8/8/2017	2 J
		10/24/2017	2.2 J
		4/25/2018	2.8 J
		8/8/2018	1.9 J
		10/24/2018	1.6 J
		4/3/2019	1.4 J
		10/9/2019	1.3 J
		2/3/2020	<2.2
		5/29/2020	1.5 J
		10/8/2020	1.3 J
		4/14/2021	1.4 J
		10/14/2021	1.3 J
		4/13/2022	1.4 J
		10/27/2022	1.1 J
		4/27/2023	1.3 J
		10/11/2023	1.4 J

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Compliance	MW-309	2/21/2018	12.2
		3/23/2018	12.2
		4/23/2018	12
		5/24/2018	17.5
		6/23/2018	24.1
		7/23/2018	33.1
		8/22/2018	43.3
		9/21/2018	35.9
		4/2/2019	35.2
		10/8/2019	21.9
		5/29/2020	28.6
		6/30/2020	--
		8/6/2020	--
		10/8/2020	21.8
		12/11/2020	--
		4/13/2021	30.3
		6/11/2021	--
		10/14/2021	27.7
		12/21/2021	--
		4/12/2022	17.9
		10/26/2022	28.9
		11/30/2022	--
		4/26/2023	143
		6/29/2023	147
		10/9/2023	80.6
		11/9/2023	89.0
	MW-310	2/21/2018	31.6
		3/23/2018	33.1
		4/23/2018	32
		5/24/2018	28
		6/23/2018	30.4
		7/23/2018	60.2
		8/22/2018	32.8
		9/21/2018	118
		4/2/2019	58.4
		10/8/2019	85.9
		5/29/2020	68.2
		10/8/2020	60
		4/13/2021	43.3
		10/14/2021	54.3
		4/12/2022	39.8
		10/26/2022	32.8
		4/26/2023	102
		10/9/2023	90.7

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Compliance	MW-311	2/21/2018	7.1
		3/23/2018	7.2
		4/23/2018	7.9
		5/24/2018	36.9
		6/23/2018	72.3
		7/23/2018	84.7
		8/22/2018	53.6
		9/21/2018	92.4
		4/2/2019	23.1
		10/8/2019	21.2
		5/29/2020	39.1
		10/8/2020	72.1
		4/14/2021	15.6
		10/14/2021	14.2
		4/12/2022	8.9
		10/27/2022	15.5
		4/26/2023	22.2
		10/9/2023	10.8

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = Not sampled
J = Estimated value below the laboratory's limit of quantitation

Note:
(1) Complete laboratory reports included in the Annual Groundwater Monitoring and Corrective Action Reports.

Created by:	SCC	Date:	11/8/2023
Checked by:	NLB	Date:	11/21/2023
PM QC Check:	TK	Date:	11/21/2023

I:\25224067.00\Deliverables\COL Mod 4-6 - Oct 2023 ASD\Tables\[Table 2 - Historical Analytical Results with SSIs.xlsx]Table 2. Analy. Rslts- CCR

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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
Dry Ash Facility (Facility ID #03025)	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	778.12	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	aband	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	aband	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	aband	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
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	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

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
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
	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	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
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	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

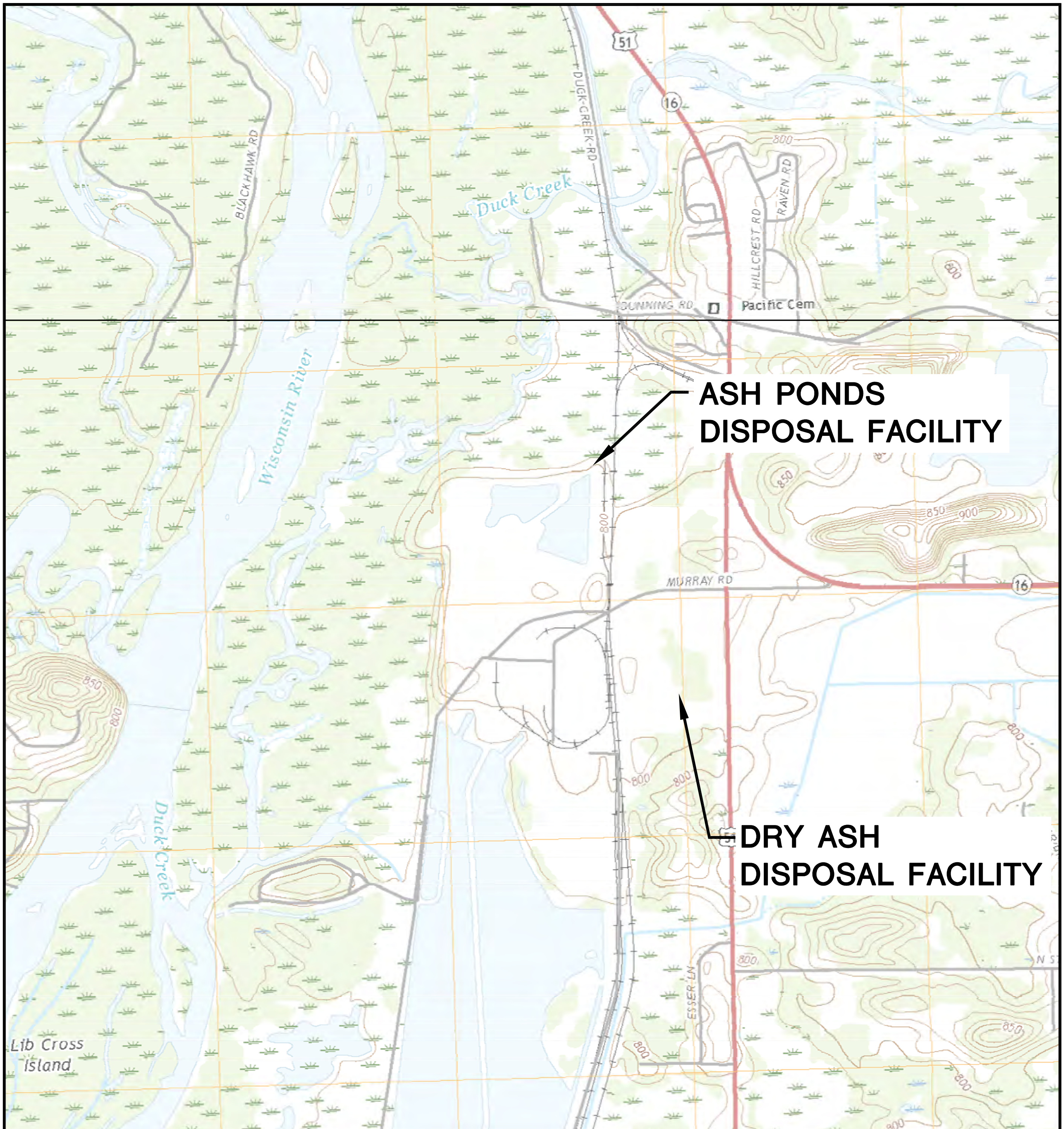
Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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	MW-312	MW-313	MW-314	MW-315	MW-316
	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	826.786	820.3	821.57	819.78	808.49
	Screen Length (ft)	10	10	10	10	10	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	52.5				43.7
	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	784.29				774.79
	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	NI	NI	NI	NI	NI
	April 4-5, 2016	786.78	785.81	785.48	788.08	789.61	789.09	785.29	785.63	786.37	--	--	--	--	--	--	NI	NI	NI	NI	NI
	July 7-8, 2016	786.31	786.28	784.60	787.36	789.26	787.43	785.19	785.05	785.89	--	--	--	--	--	--	NI	NI	NI	NI	NI
	July 28, 2016	NM	NM	784.35	NM	NM	NM	NM	784.86	785.61	--	--	--	--	--	--	NI	NI	NI	NI	NI
	October 11-13, 2016	787.64	787.76	786.18	788.18	789.78	787.88	787.36	786.45	787.22	--	--	--	--	--	--	NI	NI	NI	NI	NI
	December 29, 2016	787.37	787.05	NM	NM	NM	NM	785.66	785.72	786.63	--	--	--	--	--	--	NI	NI	NI	NI	NI
	January 25-26, 2017	787.27	786.89	785.28	789.34	789.36	789.64	785.88	785.98	786.70	785.50	785.36	785.73	--	--	--	NI	NI	NI	NI	NI
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	789.57	787.95	786.39	786.30	787.16	786.22	785.64	786.51	--	--	--	NI	NI	NI	NI	NI
	June 6, 2017	788.25	788.37	786.49	788.58	789.79	787.83	787.27	786.66	787.63	786.85	786.07	786.46	--	--	--	NI	NI	NI	NI	NI
	August 7-9, 2017	787.34	787.55	785.42	789.52	789.30	788.54	786.11	785.81	786.68	785.69	785.19	785.37	--	--	--	NI	NI	NI	NI	NI
	October 23-24, 2017	785.89	785.94	783.92	788.97	788.14	788.00	784.13	784.50	785.32	783.97	784.79	784.17	--	--	--	NI	NI	NI	NI	NI
	February 21, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI
	March 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI
	April 23-25, 2018	785.29	784.37	783.27	789.69	787.67	790.43	783.09	781.77	785.88	783.24	783.65	782.65	783.07	782.97	781.83	NI	NI	NI	NI	NI
	May 24, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI
	June 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI
	July 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI
	August 7, 2018	787.06	NM	785.20	788.25	788.56	787.63	NM	NM	786.55	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	August 22, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI
	September 21, 2018	NM	788.37	786.50	NM	NM	NM	787.90	787.01	NM	NM	NM	NM	787.08	787.24	787.66	NI	NI	NI	NI	NI
	October 22-24, 2018	788.98	789.16	787.51	789.05	790.04	788.47	788.77	787.88	788.32	787.66	786.57	787.81	787.99	788.18	788.64	NI	NI	NI	NI	NI
	April 1-4, 2019	787.04	787.56	786.52	789.72	790.07	789.44	786.63	786.82	787.35	786.72	786.71	787.53	786.30	786.38	786.38	NI	NI	NI	NI	NI
	June 12, 2019	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI
	June 19, 2019	NM	NM	786.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	October 7-9, 2019	788.47	788.31	787.02	790.41	790.36	790.65	NM	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI
CCR Rule Wells	December 13, 2019	--	--	--	--	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI
	January 17, 2020	--	--	785.58	--	--	--	--	--	--	--	--	--	--	--	--	NI	NI	NI	NI	NI
	February 3, 2020	787.24	NM	NM	NM	NM	NM	NM	NM	786.50	785.77	785.57	786.48	NM	NM	NM	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	NI	NI	NI	NI	NI
	June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI
	August 6, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	December 11, 2020	NM	NM	NM	NM	788.19	NM	NM	NM	NM	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI
	February 25, 2021	NM	NM	784.27	NM	788.36	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	June 11, 2021	NM	NM	NM	NM	NM	NM	784.19	784.66	NM	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI
	July 20, 2021	NM	NM	783.64	NM	788.39	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	December 21, 2021	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI
	February 24, 2022	NM	NM	782.34	NM	786.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	July 27, 2022	NM	NM	783.07	NM	787.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	November 30, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI
	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	NI	NI	NI	NI	NI
	January 12-13, 2023	785.20	784.55	NM	NM	NM	NM	782.75	784.10	784.88	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI
	January 20, 2023	NM	NM	NM	788.08	NM	NM	NM	NM	NM	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI
	January 24, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI
	February 20-23, 2023	785.56	784.98	NM	NM	NM	NM	NM	NM	NM	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI
	March 27-28, 2023	786.83	785.87	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI
	April 24-27, 2023	787.57	786.87	784.38	784.03	NM	782.59	785.79	786.22	786.97	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI
	May 5, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49
	May 16, 2023	787.43	787.07	783.88	784.12	dry	781.64	785.64	786.06	786.88	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48
	May 30-31, 2023	787.04	786.89	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM
	June 29-30, 2023	786.32	786.39	NM	NM	NM	NM	784.32	785.04	785.92	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM
	July 31, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM
	August 31, 2023	NM	785.30	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM
	October 9-11, 2023	784.67	784.65	781.21	780.09	779.93	780.54	782.57	783.55	784.39	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30
	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	774.29	820.30	821.57	819.78	764.79

Notes:
NM = not measured
(1) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5, 2017 sampling event. The level was allowed to return to static and was measured on October 10, 2017.
(2) 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'.

Created by:	MDB	Date:	5/6/2013
Last revision by:	NLB	Date:	11/29/2023
Checked by:	RM	Date:	11/29/2023
Proj Mgr QA/QC:	TK	Date:	4/18/2024

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.	25220067.00	DRAWN BY:	BSS	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	12/02/2019	CHECKED BY:	MDB			1
REVISED:	01/10/2020	APPROVED BY:	TK 04/10/2020			

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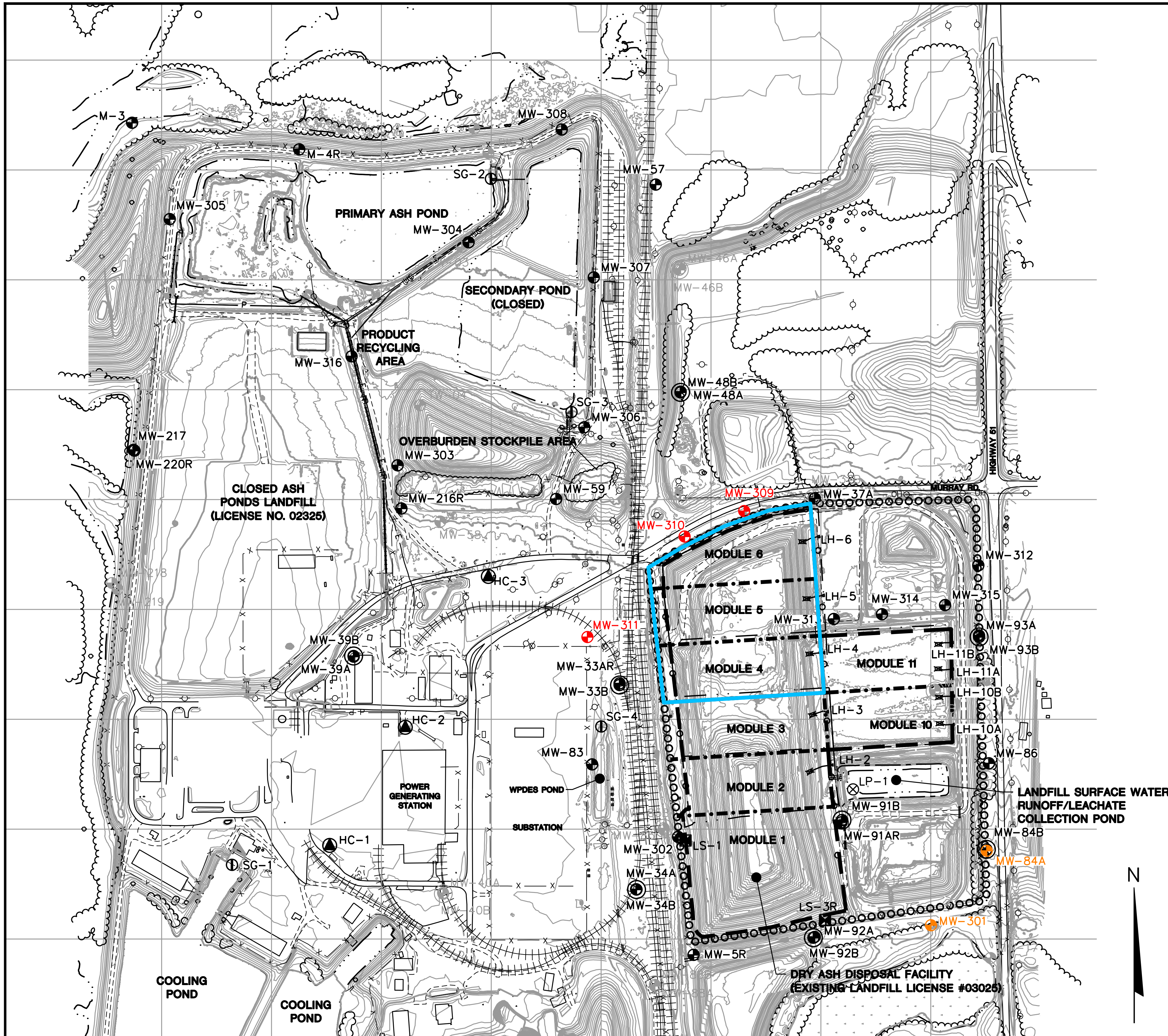

LEGEND

- 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
- 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 SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. BACKGROUND MONITORING WELLS FOR THE MODULES 4-6 DRY ASH DISPOSAL FACILITY ARE: MW-301 AND MW-84A.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	04/24/2024	APPROVED BY:	TK 05/10/2024

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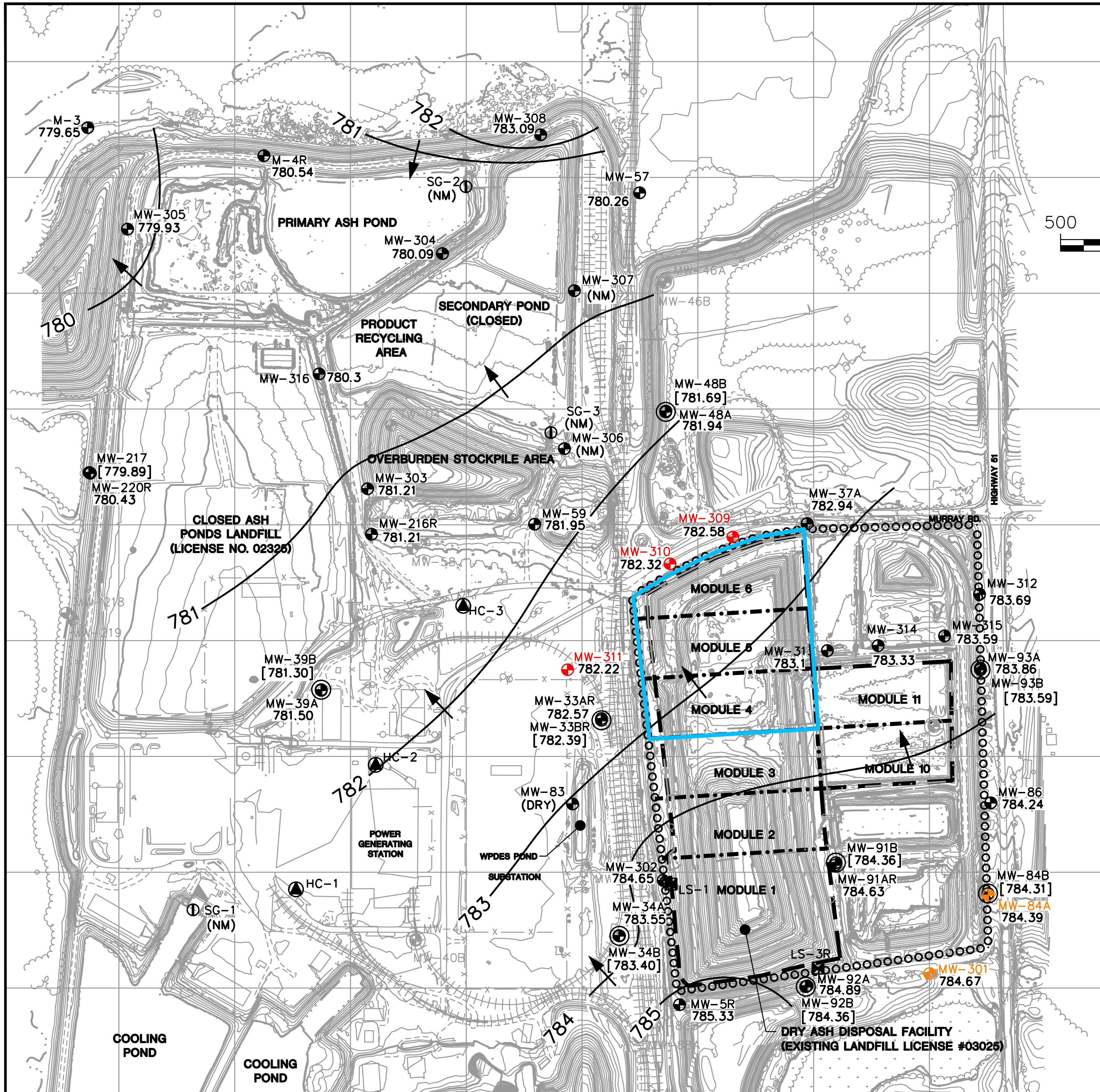
SITE: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, MODULES 4-6 DRY ASH DISPOSAL FACILITY, PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25224067.00\Drawings\Modules 4-6\Site Plan and Monitoring Well Locations.dwg, 4/25/2024 7:18:14 AM



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500 0 500

SCALE: 1" = 500'

LEGEND

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- 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
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 787.62 WATER TABLE ELEVATION
- [788.87] POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (NM) NOT MEASURED
- WATER TABLE CONTOUR
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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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. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
9. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
10. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 2023.
11. DEWATERING PUMPING WAS STOPPED BY SEPTEMBER 11, 2023.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	11/13/2023	CHECKED BY:	TK
REVISED:	04/24/2024	APPROVED BY:	TK 05/10/2024

ENGINEER: SCS ENGINEERS
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PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
MODULES 4-6 DRY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2023

FIGURE
3

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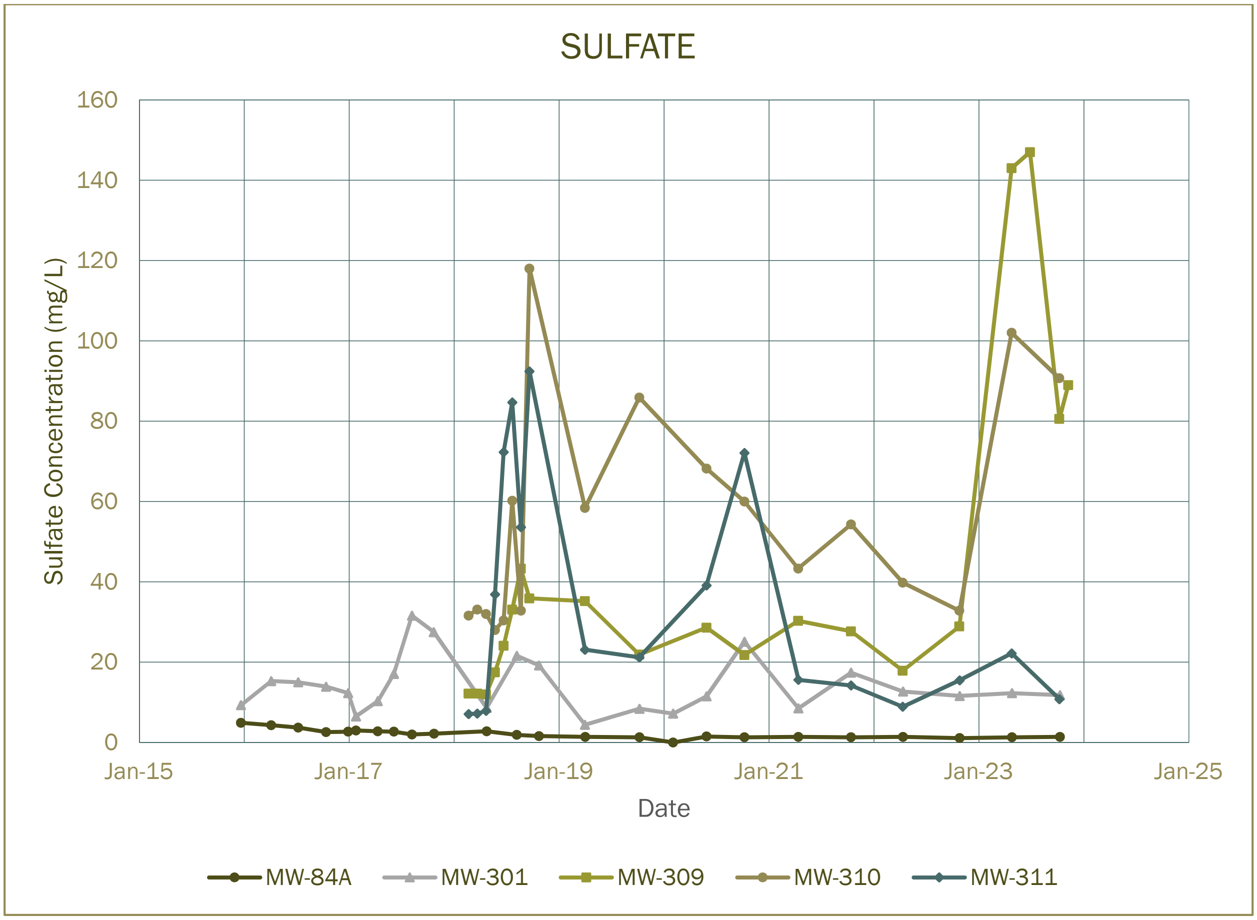
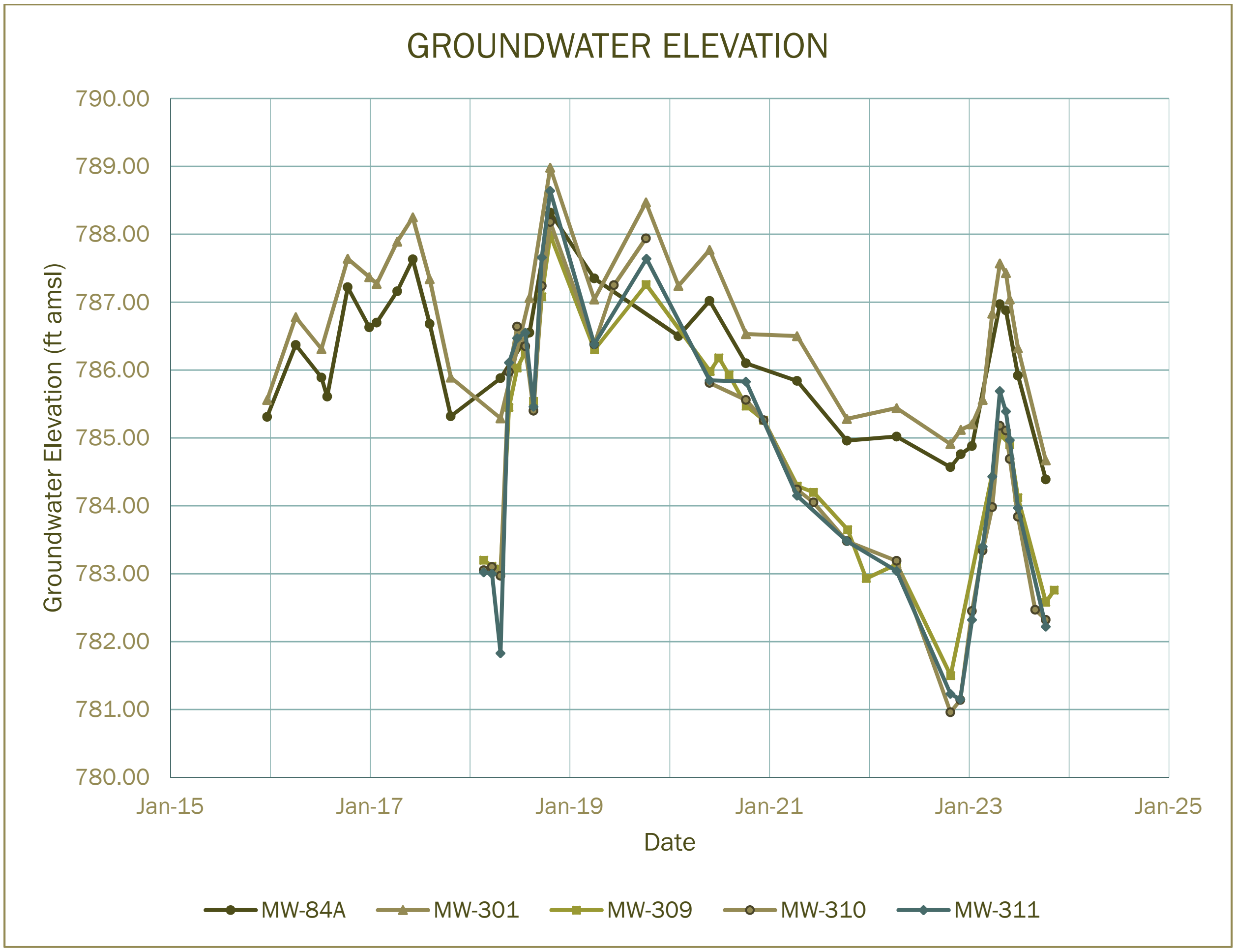
Appendix A

Trend Plots for CCR Wells

Trend Plots: Sulfate

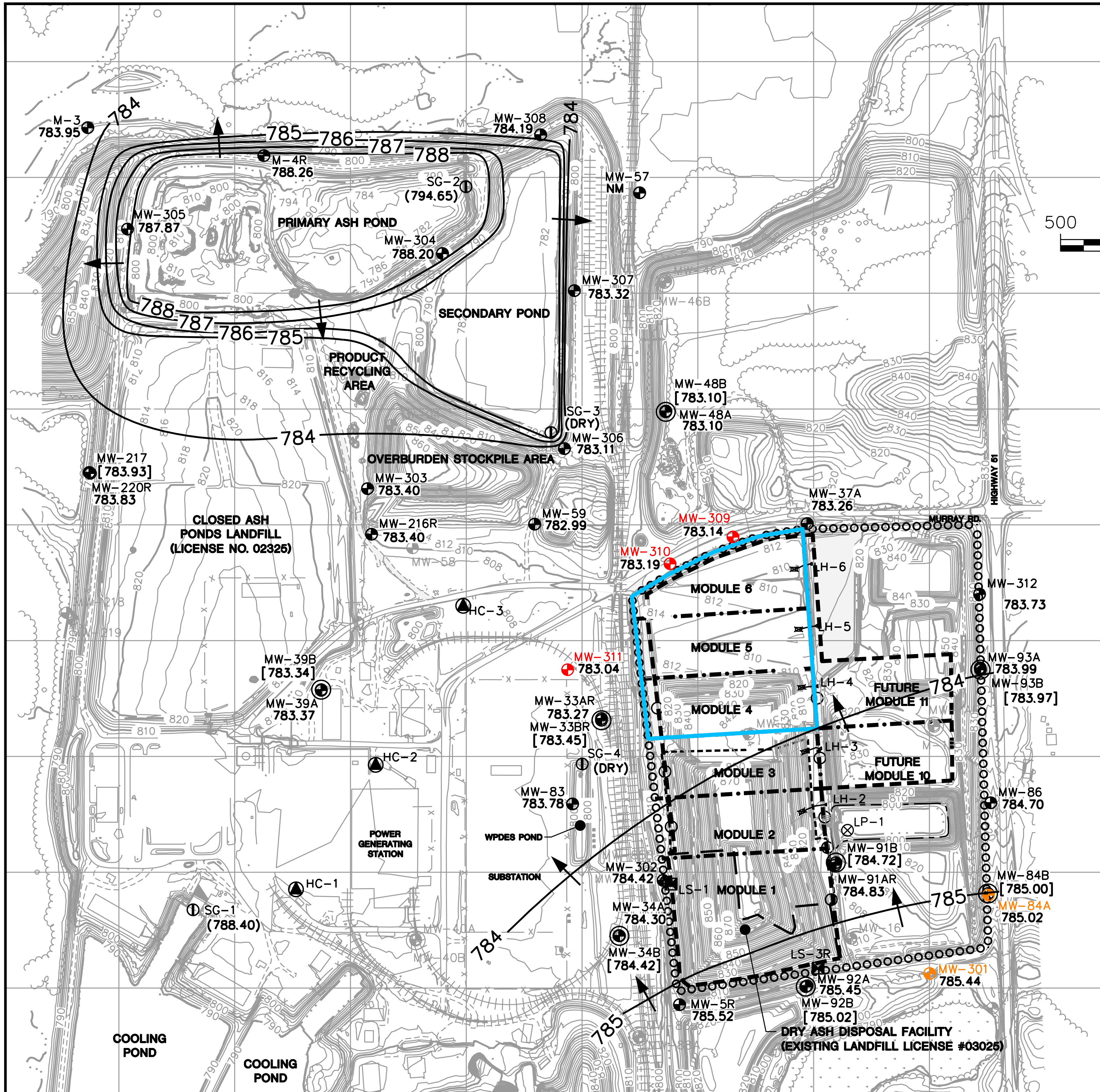


Trend Plots: Groundwater Elevation



Appendix B

Historical Water Table Maps



LEGEND

	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
—x—x—	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

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, MAY 2019, SEPTEMBER 2020, AUGUST 2021, AND NOVEMBER 2021.
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. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 11-13, 2022.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
10. MW-57 WAS INACCESSIBLE DURING THE APRIL 2022 EVENT DUE TO HIGH WATER.

PROJECT NO.	25224067.00	DRAWN BY:	KP
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CLIENT: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, W8375 MURRAY ROAD, PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, MODULES 4-6 DRY ASH DISPOSAL FACILITY, PARDEEVILLE, WI

WATER TABLE MAP
APRIL 2022

FIGURE 3

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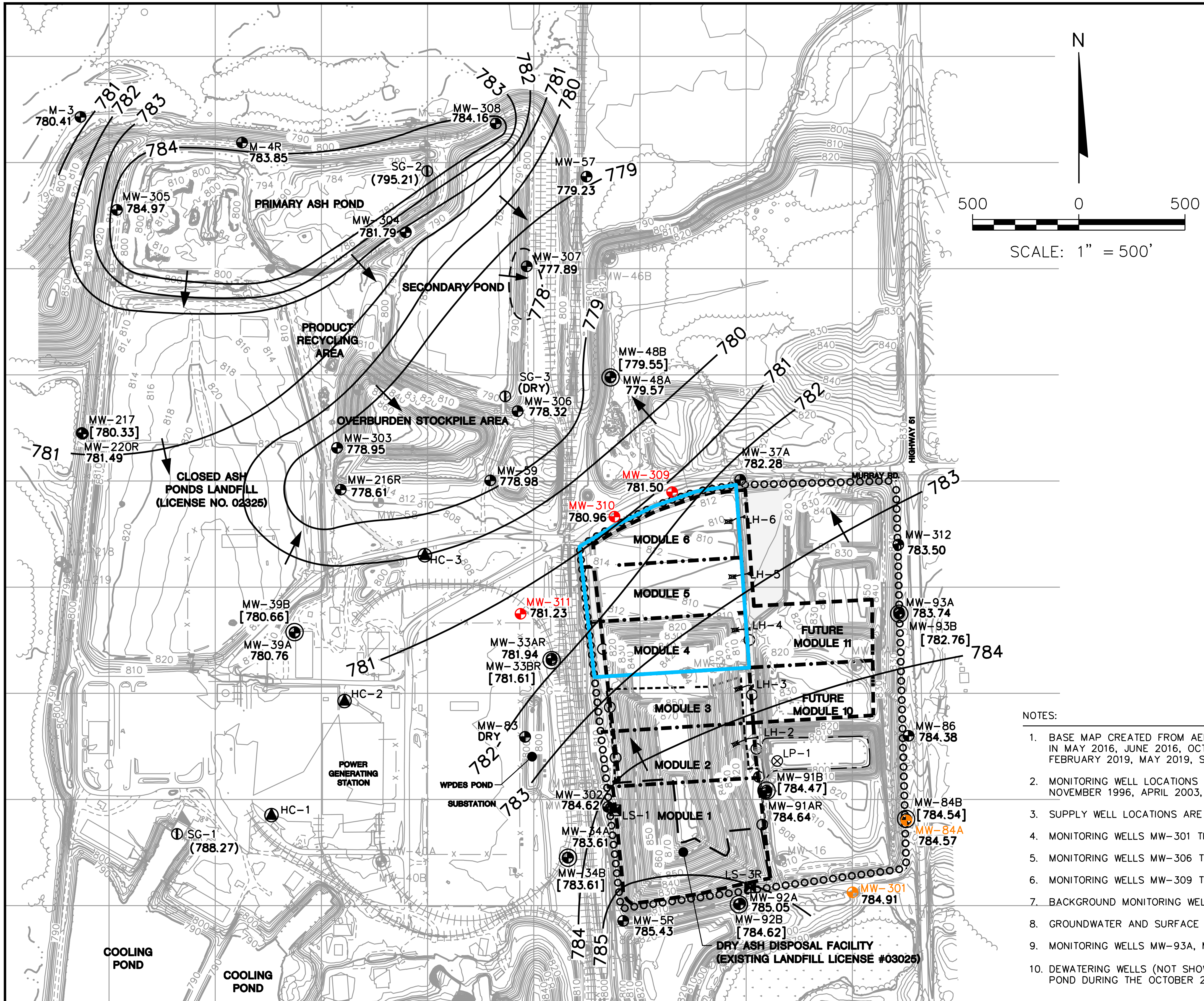

LEGEND

	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

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, MAY 2019, SEPTEMBER 2020, AUGUST 2021, AND NOVEMBER 2021.
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6. MONITORING WELLS MW-309 THROUGH MW-311 INSTALLED BY BADGER STATE DRILLING ON FEBRUARY 13-14, 2018.
7. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 25-27, 2022.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
10. DEWATERING WELLS (NOT SHOWN) AROUND THE SECONDARY POND WERE PUMPING AND DISCHARGING TO THE PRIMARY POND DURING THE OCTOBER 2022 SAMPLING EVENT.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	MDB
REVISED:	04/24/2024	APPROVED BY:	

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

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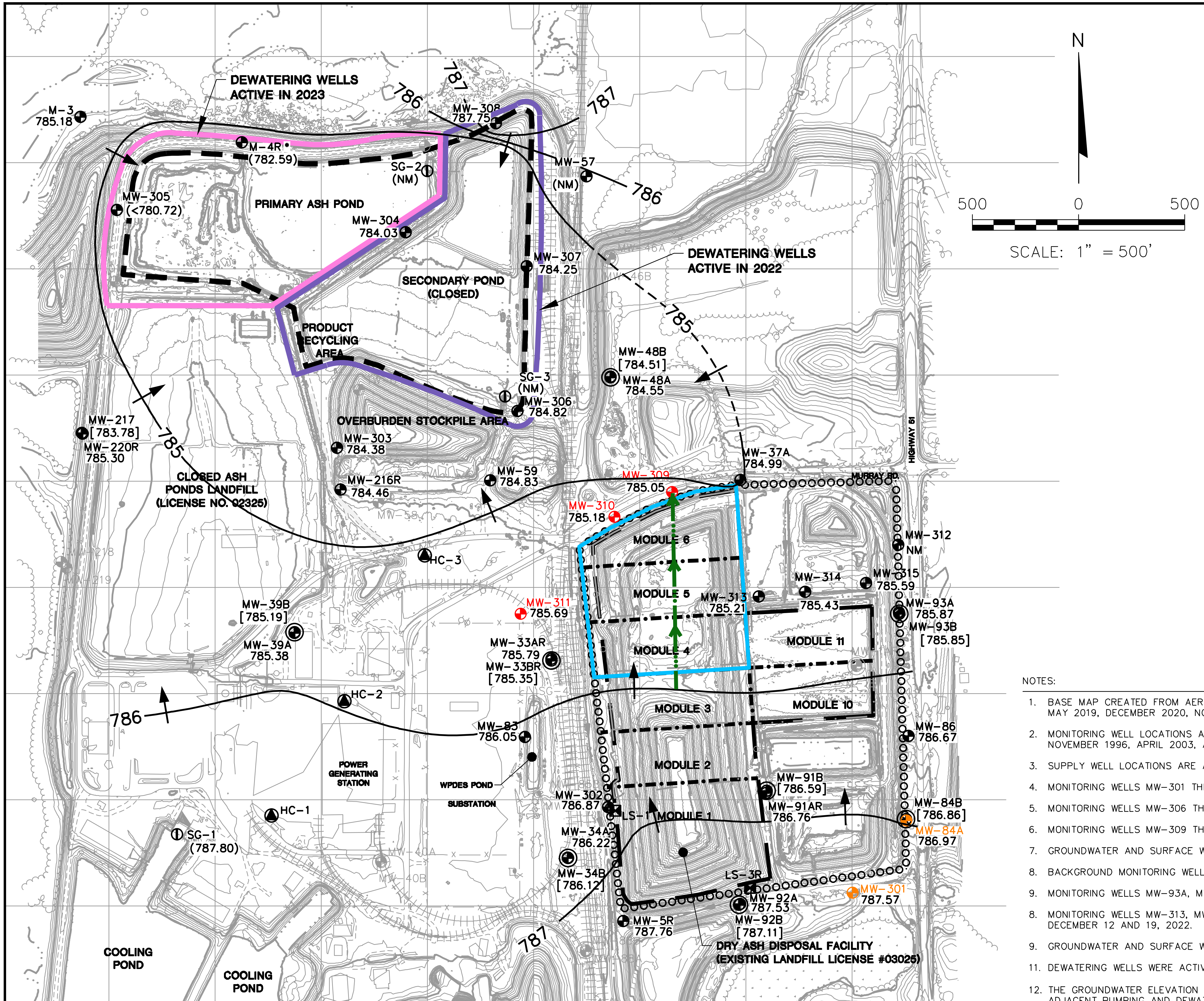
SITE: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, MODULES 4-6 DRY ASH DISPOSAL FACILITY, PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2022

FIGURE 4

I:\25224067.00\Drawings\Modules 4-6\Water Table Map-October 2022.dwg, 4/25/2024 7:38:39 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
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR UNIT
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- 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
- PRIMARY POND DEWATERING WELLS ACTIVE IN 2023
- SECONDARY POND DEWATERING WELLS ACTIVE IN 2022

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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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 4-6 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.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 24-27, 2023.
11. DEWATERING WELLS WERE ACTIVE AROUND THE PRIMARY POND DURING THE APRIL 2023 SAMPLING EVENT.
12. THE GROUNDWATER ELEVATION FOR M-4R (*) WAS NOT USED FOR CONTOURING OF THE WATER TABLE (SHALLOW) DUE TO ADJACENT PUMPING AND DEWATERING ACTIVITIES.

PROJECT NO.	25223067.00	DRAWN BY:	KP
DRAWN:	10/12/2023	CHECKED BY:	NLB
REVISED:	01/22/2024	APPROVED BY:	TK 1/29/2024

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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
MODULES 4-6 DRY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
APRIL 2023

FIGURE
3

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E2 April 2024 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration April 2024 Detection Monitoring

Dry Ash Disposal Facility, Modules 4-6
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25224067.00 | December 16, 2024

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

Table of Contents

Section Page

Tables

Figures

Appendices

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PE CERTIFICATION

 12/13/2024	I, Sherren Clark, hereby certify that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Columbia Energy Center Dry Ash Disposal Facility. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin. 12/13/2024
	(signature) (date) Sherren Clark
	(printed or typed name) License number E-29863 My license renewal date is July 31, 2026. Pages or sheets covered by this seal: Alternative Source Demonstration, April 2024 Detection
	Monitoring, Dry Ash Disposal Facility, Modules 4-6
	Columbia Energy Center, Pardeeville, Wisconsin (Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (U.S. EPA, 2015), and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.94(e)(2). The applicable sections of the Rule are provided below in *italics*.

This ASD also provides the results for the April 2024 sampling event and a supplemental resampling event completed in June 2024.

1.1 §257.94(E)(2) ALTERNATIVE SOURCE DEMONSTRATION REQUIREMENTS

The owner and operator may demonstrate that a source other than the CCR Unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a statistically significant increase over background levels.

An ASD is completed when there are exceedances of one or more benchmarks established within the groundwater monitoring program. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSI sulfate observed in the statistical evaluation of the April 2024 detection monitoring event and the June 2024 resampling event at the Columbia Energy Center (COL) Dry Ash Disposal Facility, Modules 4-6 CCR Unit (Mod 4-6).

1.2 SITE INFORMATION AND MAP

The COL site is located at W8375 Murray Road, Pardeeville, Columbia County, Wisconsin (**Figure 1**). The COL site is an active coal-burning generating station, which has been burning coal and disposing of CCR on site since the mid-1970s. The layout of the site is shown on **Figure 2**. The COL property includes two areas of CCR storage and disposal. These are the Dry Ash Disposal Facility (ADF) and the Ash Ponds Facility. This ASD evaluates the conditions at the site for Mod 4-6 of the ADF only. The Module 4 CCR Unit became operational in 2018. Modules 5 and 6 were constructed in 2021 and began receiving waste in 2022. The monitoring network certification was updated to include Modules 5 and 6 on December 9, 2021, and the CCR Unit was subsequently referred to as Mod 4-6. The ADF is operated under the Wisconsin Department of Natural Resources (WDNR) License No. 3025.

The groundwater monitoring system at the COL Mod 4-6 facility monitors a single CCR Unit:

- COL Dry Ash Disposal Facility – Modules 4-6

A map showing the CCR Unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program and the state monitoring program is provided on **Figure 2.** Separate monitoring systems have been established for the other CCR Units at COL. As of April 2024, the other CCR Units include Modules 1-3 of the COL ADF, Modules 10-11 of the COL ADF, Modules 12-13 of the COL ADF, the former Primary Ash Pond, and the former Secondary Ash Pond.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

The statistical evaluation was completed in accordance with 40 CFR 257.93(f)(3) using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the Upper Prediction Limit (UPL) to evaluate whether an SSI has occurred. The evaluation was based on an intrawell UPL with 1-of-2 retesting, calculated using Sanitas software. The retesting approach results in a slightly lower UPL, but only 1 of 2 samples collected for the event (original and retest) must meet the UPL to demonstrate compliance. The intrawell UPLs, the April 2024 sampling results, and the June 2024 resampling results are summarized in the attached **Table 1.**

The April 2024 SSIs include the following parameter and well:

- Sulfate: MW-309

Concentration trends for the parameters with SSIs are shown in **Appendix A.**

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

- Background information (**Section 2.0**)
- Evaluation of potential that SSIs are due to methodology or analysis (**Section 3.0**)
- Evaluation of potential that SSIs are due to natural sources or man-made sources other than the CCR Units (**Section 4.0**)
- ASD conclusions (**Section 5.0**)
- Monitoring recommendations (**Section 6.0**)

Historical monitoring results from background and compliance sampling for the CCR Rule constituent results with an SSI are provided in **Table 2.** The laboratory reports for the April 2024 detection monitoring event and June 2024 resampling event will be included in the 2024 Annual Groundwater Monitoring and Corrective Action Report to be submitted in January 2025. Complete laboratory reports for the background monitoring events and the previous detection monitoring events were included in previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

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 ADF. Immediately underlying the surficial sand and gravel aquifer is the Cambrian-Ordovician sandstone aquifer.

Additional details on the regional geology and hydrogeology were provided in the May 2020 ASD (SCS Engineers [SCS], 2020).

2.1.2 Site Information and Groundwater Flow

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 ADF were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn Engineering, Inc. [Warzyn], 1978). During drilling of CCR well MW-301, the unconsolidated materials were identified as consisting primarily of silty sand. The boring log for previously installed monitoring well MW-84A shows silty sand and sand as the primary unconsolidated materials at these locations. CCR monitoring wells MW-84A and MW-301 are screened within the unconsolidated sand unit. The geology in the vicinity of wells MW-309, MW-310, and MW-311 is a poorly graded sand and gravel.

Shallow groundwater at the site generally flows to the northwest across the existing landfill area, then generally flows west toward the Wisconsin River. A groundwater flow map for April 2024 is shown on **Figure 3.** The groundwater elevation data for the state and CCR monitoring program wells are provided in **Table 3.**

Historically, localized groundwater mounding was associated with the ash ponds; however, flow in the ash ponds area changed in 2022 and 2023 as the ponds were closed and CCR was removed. In 2022, dewatering wells located around the Secondary Ash Pond lowered the water table near the Secondary Ash Pond and discharged groundwater to the Primary Ash Pond. Beginning in spring 2023, dewatering activities switched to the Primary Ash Pond area, and groundwater pumped from dewatering wells around the Primary Ash Pond was discharged to the large cooling pond south of the generating station. Groundwater dewatering in the Primary Ash Pond was completed shortly before the October 2023 sampling event. For comparison to the April 2024 event, the April 2022, October 2022, April 2023, and October 2023 water table maps are provided in **Appendix B.**

Dewatering for ash pond closures affected water levels and groundwater flow directions in the Mod 4-6 area, as shown on the water table maps (**Figure 3** and **Appendix B**).

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-301 and MW-84A. The downgradient wells include MW-309, MW-310, and MW-311. The background wells are shared with the other COL CCR Units. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 36 to 38 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Additional groundwater monitoring wells currently exist at COL as part of the monitoring systems developed for the state monitoring program and for the other CCR Units.

Monitoring wells for the state monitoring program are installed in the unconsolidated sand and gravel unit, which is the uppermost aquifer as defined under 40 CFR 257.53. This shallow monitoring system includes water table wells and mid-depth piezometers. Well depths range from approximately 14 to 76 feet, measured from the top of the well casing.

3.0 METHODOLOGY AND ANALYSIS REVIEW

To evaluate the potential that an SSI is due to a source other than the regulated CCR Unit, SCS Engineers (SCS) used a two-step evaluation process. First, the sample collection, field and laboratory analysis, and statistical evaluation were reviewed to identify any potential error or analysis that led to exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS

Field notes and sampling results were reviewed to determine if a sampling error could have caused or contributed to the observed SSIs. Potential field sampling errors or issues could include mislabeling of samples, improper sample handling, missed holding times, cross contamination during sampling, or other field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers.

SCS collected samples on April 15 and 17, 2024. Retest samples were collected on June 4, 2024. Field parameter results were compiled by SCS and provided to the laboratory for inclusion in the laboratory report. SCS did not identify issues with the sample collection based on review of the data and field notes.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2024 detection monitoring event and the June 2024 resampling event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results.

Based on the review of the laboratory reports, SCS did not identify any laboratory quality control flags or issues in the laboratory reports that affect the usability of the data for detection monitoring.

A time series plot of the sulfate analytical data was also reviewed for anomalous results that might indicate a possible sampling or laboratory error (e.g., dilution error or incorrect sample labeling). The time series plot is provided in Appendix A. The sulfate concentrations observed are within the range of historical concentrations for the COL ADF as a whole and no anomalous results were identified.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods included a quality control check of the following:

- Input analytical data vs. laboratory analytical reports
- Statistical method and process for each SSI

Based on the April 2024 sampling results and the June 2024 retest results, an SSI for sulfate occurred for MW-309 for the April 2024 semiannual event.

Based on the review of the statistical evaluation, SCS did not identify any errors in the statistical evaluation that caused or contributed to the determination of an intrawell SSI for sulfate at MW-309.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the April 2024 monitoring event based on the methodology and analysis review, and no errors or issues caused or contributed to the reported SSIs.

4.0 ALTERNATIVE SOURCES

This section discusses the potential alternative sources for the sulfate SSI at the downgradient monitoring well MW-309; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is the most likely cause of the observed SSIs.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an intrawell approach, comparing the April 2024 detection monitoring results to the UPLs calculated based on background sampling of the compliance wells (MW-309, MW-310, and MW-311). If concentrations of a constituent that is naturally present in the aquifer vary with time, then the potential exists that the compliance sampling concentrations may be higher than background concentrations due to natural temporal variation.

Temporal variation can occur seasonally or due to longer-term events such as changes in infiltration patterns and groundwater flow directions caused by wet or dry years.

Background sampling at the three Mod 4-6 compliance wells was performed prior to disposal of CCR in Mod 4-6. Because the background sampling at the three compliance wells was performed after other potential man-made sources of sulfate had been in operation for many years, it is difficult to determine how much of the variation in sulfate concentrations is due to natural sources versus man-made alternative sources associated with the long-term use of the property, as discussed in Section 4.1.2. Based on comparison to the two upgradient wells, it appears likely that sulfate may reflect man-made sources. Regardless of the source, natural temporal variations in infiltration and groundwater flow direction may have contributed to the SSI for sulfate at MW-309.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the sulfate SSIs could include the closed ash pond landfill, the active and inactive ash ponds (currently in the closure process), the surface water/leachate collection pond for the ADF, the former ash pond effluent ditch, the coal storage area, railroad operations, road salt use, storm water runoff from the plant entrance road, and/or other plant operations.

Historically, groundwater flow directions have varied significantly at the site due to changes in water and ash management, making it difficult to identify a specific source for low levels of sulfate in the area of the Mod 4-6 compliance monitoring wells. Furthermore, recent dewatering activities around the Secondary Ash Pond (2022) and the Primary Ash Pond (2023) likely also affected groundwater flow, further complicating the evaluation of historic sources. Nevertheless, there are several lines of evidence indicating that the April 2024 SSI for sulfate are not due to a release from the Mod 4-6 CCR unit.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSI for sulfate in compliance well MW-309, relative to the intrawell background sampling, are due to one or more alternative sources including:

1. The Mod 4-6 CCR Unit was constructed with a composite liner system and leachate collection system. Module 4 has only been receiving CCR since late 2018, and Modules 5 and 6 started receiving CCR in 2022; therefore, it is unlikely that a release from Mod 4-6 could have reached MW-309 by April 2024. More information about the composite liner is presented in Section 4.2.1.

2. The sulfate concentrations at MW-309 in April and June 2024 were within the range of background results observed at adjacent well MW-310. More information on background concentrations for sulfate is provided in Section 4.2.2.

3. The concentration of sulfate has continued a decreasing trend following the increase in April 2023. This short-term increase and decrease is not an expected behavior in response to a release through the composite liner. More information about the concentration changes with time is presented in Section 4.2.3.

4. Groundwater pumping for dewatering in the ash pond area likely induced changes in groundwater levels and flow patterns that may have contributed to short-term changes in sulfate concentrations at MW-309. The influence of dewatering is discussed in Section 4.2.4.

5. Because MW-309 is a shallow well located near the plant entrance road, influences from surface water infiltration, precipitation, or dissolution of sulfate impurities in rock salt (a deicing material) may be accentuated. These factors contribute to temporal variability, as discussed in Section 4.2.5.

6. As discussed in Section 3.3, the small background data set was collected over a short period of time from February through September 2018, and likely does not represent the full range of temporal variability in background concentrations at the compliance monitoring wells.

These lines of evidence and the supporting data are discussed in more detail in the following sections.

4.2.1 Mod 4-6 Composite Liner

The Mod 4-6 CCR Unit was constructed with a composite liner system and a leachate collection system, and has only been receiving CCR since late 2018 in Module 4 and since 2022 in Modules 5 and 6. Given the short active timeframe, it is very unlikely that a release from Mod 4-6 could have reached MW-309 by April 2024. The liner system includes the following:

- 2 feet of compacted clay
- Geosynthetic clay liner (GCL)
- 60-mil high density polyethylene (HDPE) geomembrane
- Leachate collection drainage layer
- Leachate collection piping

The Module 4 liner was constructed in 2018, and CCR placement in Module 4 began in November 2018. CCR placement in Modules 5 and 6 began in 2022.

Given the liner system in place, a release from Mod 4-6 would have to penetrate the HDPE liner at a flaw, flow vertically through the GCL and compacted clay liner, and travel with the groundwater approximately 600 feet north to MW-309 from Module 4 in less than 6 years, or travel to the wells from Modules 5 and 6 in 2 years. Based on the hydraulic conductivity of the liner clay (10^{-8} centimeters/second), the lack of any evidence of a flaw in the HDPE liner, and the very low estimated average groundwater velocity (0.2 to 4 feet per year [SCS, 2021a]), it is very unlikely that changes in sulfate concentrations at MW-309 reflect a release from Mod 4-6. Extensive testing was performed as part of the WDNR-approved construction documentation (SCS, 2021b) to document the proper construction of the liner.

4.2.2 Area Background Concentrations for Sulfate

The April and June 2024 concentrations at MW-309 were within the range of background concentrations for nearby well MW-310. The April and June 2024 results were also lower than the previous sulfate results in April, June, October, and November 2023. The April and June 2024 results indicate that the sulfate concentration has returned to the range observed for wells along the entrance road prior to CCR disposal in Mod 4-6 after a short-term increase above that range.

4.2.3 Sulfate Concentration Changes with Time

The concentration of sulfate reported for samples from MW-309 increased in early 2023, but decreased in late 2023 and has continued to drop in the April and June 2024 sampling event. This short-term increase and decrease are not an expected behavior in response to a release through the composite liner. The previous increase was attributed to alternative sources as discussed in ASDs prepared for the 2023 monitoring events.

The historical sulfate concentrations from all five Mod 4-6 wells are shown in Table 2 and on the time series plots in Appendix A.

4.2.4 Influence of Dewatering Well Pumping

Groundwater pumping for dewatering in the ash pond area likely induced changes in groundwater levels and flow patterns that may have contributed to the short-term peak in sulfate at MW-309 in April and June 2023 and the subsequent decrease in sulfate concentrations. In 2022, dewatering wells were installed around the Secondary Pond, and groundwater was pumped to lower the water table below the pond to facilitate CCR removal and pond closure. Pumped groundwater was discharged to the Primary Ash Pond. In 2023, groundwater was pumped from dewatering wells installed around the Primary Ash Pond to lower the water table below the pond to facilitate CCR removal and pond closure. The pumped groundwater was discharged to the large cooling pond south of the generating station.

The dewatering activities at the Primary Ash Pond were completed in September 2023, and excavation of CCR material from the Primary Ash Pond was completed in early October 2023. For comparison, the April 2022, October 2022, April 2023, and October 2023 water table maps are provided in **Appendix B**.

The April 2022 water table map shows radial flow away from the Primary Ash Pond and flow to the northwest in the Mod 4-6 area. The October 2022 water table map shows the influence of dewatering around the Secondary Pond. The April 2023 water table map shows the influence of initial dewatering around the Primary Ash Pond, and potentially some residual effects of the 2022 dewatering around the Secondary Pond. The October 2023 and April 2024 maps both show a westerly flow direction to the west of the Primary Pond. All maps continue to show flow being generally to the north and/or northwest in Mod 4-6, but hydraulic gradients and flow paths likely varied locally as dewatering was started and stopped at different locations.

4.2.5 Surface Water Infiltration Effects

Because MW-309 is a shallow well located near the plant entrance road, influences from surface water infiltration, precipitation, or dissolution of sulfate impurities in rock salt (a deicing material) may be accentuated. These factors contribute to temporal variability.

The influence of surface water infiltration and road salt impacts is apparent in the chloride monitoring results for MW-309 and MW-310. During background monitoring, prior to CCR disposal in Mod 4-6, MW-309 had chloride concentrations ranging from 141 to 811 milligrams per liter (mg/L), and concentrations since then have been highly variable but below the intrawell UPL.

While chloride provides the strongest indication of impacts from surface water infiltration, concentrations of other parameters can also vary to the surface water impacts. Sulfate can be present as an impurity in rock salt used for deicing. Surface water infiltration can also affect seasonal water levels and local flow directions.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSI reported for sulfate at MW-309 demonstrate that the SSI is likely due to sources other than the Mod 4-6 CCR Unit.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the COL Mod 4-6 CCR Unit may continue with detection monitoring based on this ASD. The ASD report will be included in the 2024 Annual Report due January 31, 2025.

7.0 REFERENCES

RMT, 2003, Water Table Map (April 2023), Figure 3.

SCS Engineers (SCS), 2023, Alternative Source Demonstration, October 2022 Detection Monitoring, Dry Ash Disposal Facility, Modules 4-6, Columbia Energy Center, Pardeeville, WI, May 31, 2023.

SCS, 2020, Alternative Source Demonstration, May 2020 Detection Monitoring, Dry Ash Disposal Facility, Module 4, Columbia Energy Center, Pardeeville, WI, November 12, 2020.

SCS, 2021a, 2020 Annual Groundwater Monitoring and Corrective Action Report, Columbia Energy Center, Dry Ash Disposal Facility, Module 4, Pardeeville, WI, January 29, 2021.

SCS, 2021b. Phase 1, Modules 5 and 6 Construction Documentation Report, Columbia Energy Center, Dry Ash Disposal Facility, Pardeeville, WI, December 2, 2021.

U.S. EPA, 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule, April 2015.

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.

Warzyn Engineering, Inc., 1981, Water Table Contour Map 2/4/81, Drawing No. C7134-94.

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Tables

Table 1. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Module 4-6 / SCS Engineers Project #25224067.00

	Background Wells		Compliance Wells						
Parameter Name	**MW-84A**	**MW-301**	**MW-309**			**MW-310**		**MW-311**	
	4/17/2024	4/17/2024	**Intrawell UPL**	4/15/2024	6/4/2024	**Intrawell UPL**	4/15/2024	**Intrawell UPL**	4/15/2024
Groundwater Elevation, ft amsl	784.90	785.27		782.79	784.27		782.68		782.64
Appendix III									
Boron, µg/L	11.9	24.9	61.9	38.7	--	82.4	65.2	43.1	30.9
Calcium, µg/L	73,700	102,000	137,000	82,600	--	65,700	44,600	76,300	59,900
Chloride, mg/L	3.2	1.6 J	772	391	--	277	175	3.67	2.3
Fluoride, mg/L	0.12 J	<0.095	DQ	<0.095	--	DQ	<0.095	DQ	<0.095
Field pH, Std. Units	7.68	7.06	7.94	7.27	7.55	8.02	7.63	7.95	7.40
Sulfate, mg/L	1.4 J	11.5	64.6	75.1	68.8	107	98.9	124	10.1
Total Dissolved Solids, mg/L	322	458	1,600	948	--	773	686	380	276

4.4 — Blue shaded cell indicates the compliance well result exceeds the UPL (background) and the Limit of Quantitation (LOQ).

Abbreviations:

UPL = Upper Prediction Limit
DQ = Double Quantification
-- = Not Analyzed
LOQ = Limit of Quantitation
LOD = Limit of Detection
mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase

Lab Notes:

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

Notes:

1. Intrawell UPLs are based on 1-of-2 retesting approach; therefore, there is no SSI if either the original sample result or the resample are below the UPL.
2. Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.
3. Intrawell UPLs were calculated from background sampling results for the compliance wells from February 2018 through October 2023.

Created by:	RM	Date:	5/24/2024
Last revision by:	RM	Date:	6/24/2024
Checked by:	BLR	Date:	6/28/2024
Scientist/PM QA/QC:	TK	Date:	9/3/2024

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Background	MW-301	12/22/2015	9.3
		4/5/2016	15.3
		7/8/2016	15
		10/13/2016	13.9
		12/29/2016	12.3 J
		1/25/2017	6.5
		4/11/2017	10.3
		6/6/2017	17.1
		8/8/2017	31.6
		10/23/2017	27.5
		4/25/2018	8.6
		8/8/2018	21.6
		10/24/2018	19.2
		4/2/2019	4.4
		10/9/2019	8.4
		2/3/2020	7.2
		5/29/2020	11.5
		10/8/2020	25.1
		4/14/2021	8.5
		10/14/2021	17.4
		4/13/2022	12.7
		10/27/2022	11.6
		4/27/2023	12.3
		10/11/2023	11.8
		4/17/2024	11.5
	MW-84A	12/22/2015	4.9
		4/5/2016	4.3
		7/8/2016	3.7 J
		10/13/2016	2.6 J
		12/29/2016	2.7 J
		1/25/2017	3
		4/11/2017	2.8 J
		6/6/2017	2.7 J
		8/8/2017	2 J
		10/24/2017	2.2 J
		4/25/2018	2.8 J
		8/8/2018	1.9 J
		10/24/2018	1.6 J
		4/3/2019	1.4 J
		10/9/2019	1.3 J
		2/3/2020	<2.2
		5/29/2020	1.5 J
		10/8/2020	1.3 J
		4/14/2021	1.4 J
		10/14/2021	1.3 J
		4/13/2022	1.4 J
		10/27/2022	1.1 J
		4/27/2023	1.3 J
		10/11/2023	1.4 J
		4/17/2024	1.4 J

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Compliance	MW-309	2/21/2018	12.2
		3/23/2018	12.2
		4/23/2018	12
		5/24/2018	17.5
		6/23/2018	24.1
		7/23/2018	33.1
		8/22/2018	43.3
		9/21/2018	35.9
		4/2/2019	35.2
		10/8/2019	21.9
		5/29/2020	28.6
		6/30/2020	--
		8/6/2020	--
		10/8/2020	21.8
		12/11/2020	--
		4/13/2021	30.3
		6/11/2021	--
		10/14/2021	27.7
		12/21/2021	--
		4/12/2022	17.9
		10/26/2022	28.9
		11/30/2022	--
		4/26/2023	143
		6/29/2023	147
		10/9/2023	80.6
		11/9/2023	89.0
		4/15/2024	75.1
		6/4/2024	68.8
	MW-310	2/21/2018	31.6
		3/23/2018	33.1
		4/23/2018	32
		5/24/2018	28
		6/23/2018	30.4
		7/23/2018	60.2
		8/22/2018	32.8
		9/21/2018	118
		4/2/2019	58.4
		10/8/2019	85.9
		5/29/2020	68.2
		10/8/2020	60
		4/13/2021	43.3
		10/14/2021	54.3
		4/12/2022	39.8
		10/26/2022	32.8
		4/26/2023	102
		10/9/2023	90.7
		4/15/2024	98.9

Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 4-6

Well Group	Well	Collection Date	Sulfate (mg/L)
Compliance	MW-311	2/21/2018	7.1
		3/23/2018	7.2
		4/23/2018	7.9
		5/24/2018	36.9
		6/23/2018	72.3
		7/23/2018	84.7
		8/22/2018	53.6
		9/21/2018	92.4
		4/2/2019	23.1
		10/8/2019	21.2
		5/29/2020	39.1
		10/8/2020	72.1
		4/14/2021	15.6
		10/14/2021	14.2
		4/12/2022	8.9
		10/27/2022	15.5
		4/26/2023	22.2
		10/9/2023	10.8
		4/15/2024	10.1

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = Not sampled
J = Estimated value below the laboratory's limit of quantitation

Note:
(1) Complete laboratory reports included in the Annual Groundwater Monitoring and Corrective Action Reports.

Created by:	SCC	Date:	11/8/2023
Last revision by:	RM	Date:	10/15/2024
Checked by:	JSN	Date:	10/22/2024
PM QC Check:	TK	Date:	11/27/2024

I:\25224067.00\Deliverables\COL Mod 4-6 - April 2024 ASD\Tables\[Table 2 - Historical Analytical Results with SSIs.xlsx]Table 2. Analy. Rslts- CCR

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	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
Dry Ash Facility (Facility ID #03025	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	778.12	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	aband	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	aband	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	aband	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
	February 20-23, 2023	aband	aband	NM	783.57	NM	784.48	NM	NM	NM	785.25	NM	NM	NM	NM	NM	NM	NM	NM	NM
	March 27-28, 2023	aband	aband	NM	784.52	NM	785.23	NM	NM	NM	786.21	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	aband	aband	787.76	785.79	785.35	786.22	786.12	784.99	786.05	786.97	786.86	786.67	786.76	786.59	787.53	787.11	785.87	785.85	785.55
	May 16, 2023	aband	aband	787.79	785.64	785.25	786.06	786.05	785.39	785.77	786.88	786.79	786.74	786.95	786.75	787.47	787.05	786.23	786.21	785.97
	May 30-31, 2023	aband	aband	NM	785.23	NM	785.70	NM	NM	NM	786.57	NM	NM	NM	NM	NM	NM	NM	NM	NM
	October 9-11, 2023	aband	aband	785.33	782.57	782.39	783.55	783.40	782.94	dry	784.39	784.31	784.24	784.63	784.36	784.89	784.36	783.86	783.59	783.69
	April 15-17, 2024	aband	aband	dry	783.02	782.94	784.14	784.11	782.95	783.41	784.90	784.84	784.54	784.61	784.57	785.19	784.75	783.88	783.87	783.59
	April 19, 2024	aband	aband	785.47	783.06	783.02	784.28	784.30	783.05	dry	785.05	785.01	784.67	784.74	784.62	785.63	785.16	783.95	783.95	783.68
	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

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

	Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
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
	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
	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
	October 8, 2013	781.22	786.67	NM	NM	783.69	783.58	NM	NM	783.39	782.27	782.36
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	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
	June 3, 2022	NM	NM	NM	NM	NM	NM	782.13	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
	March 27-28, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
	April 24-27, 2023	785.18	782.59	785.38	785.19	784.55	784.51	NM	784.83	784.46	783.78	785.30
	May 16, 2023	782.79	781.64	784.70	784.58	784.60	784.49	782.80	784.68	783.94	782.07	784.03
	October 9-11, 2023	779.65	780.54	781.50	781.30	781.94	781.69	780.26	781.95	781.21	779.89	780.43
	April 15-17, 2024	781.73	781.38	782.58	782.51	782.42	782.35	781.82	782.23	782.17	781.47	783.40
	April 19, 2024	NM	dry	782.78	782.80	782.57	782.56	NM	782.35	782.29	781.65	783.48

Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25224067.00

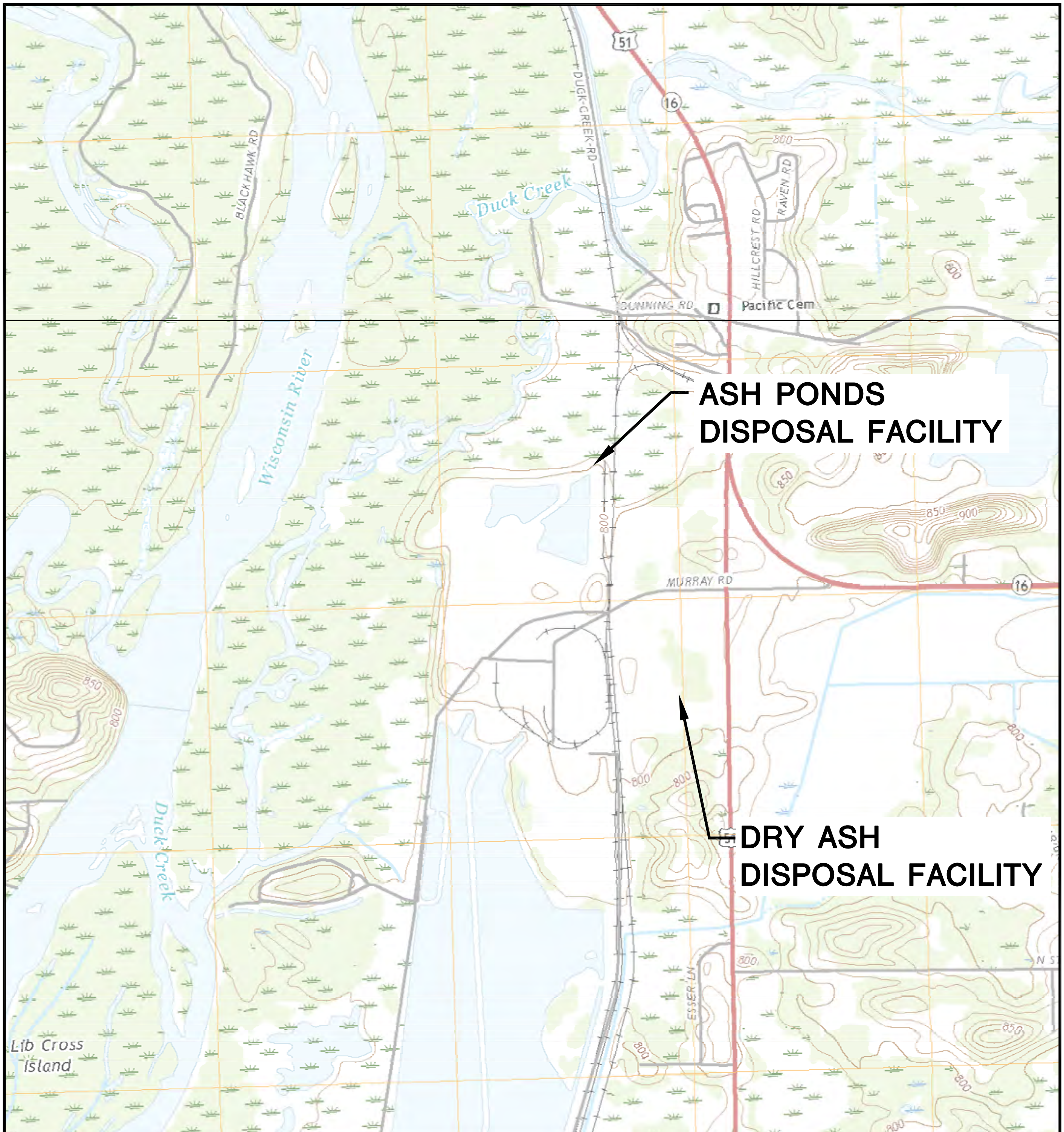
	Well Number	MW-301	MW-302	MW-303	MW-304	MW-304R	MW-305	M-4R	MW-33AR	MW-34A	MW-84A
	Top of Casing Elevation (feet amsl)	806.89	813.00	815.72	805.42	804.34	806.32	806.10	808.29	805.95	814.28
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	10
	Total Depth (ft from top of casing)	29.40	33.6	35.80	25.7	30.73	25.6	39.58	31.08	35.43	40.21
	Top of Well Screen Elevation (ft)	787.49	789.40	785.72	789.72	783.61	790.72	776.52	787.21	780.52	784.07
	Measurement Date										
	December 21-22, 2015	785.56	784.78	784.11	786.13	NI	788.96	787.58	783.77	783.50	785.31
	April 4-5, 2016	786.78	785.81	785.48	788.08	NI	789.61	789.09	785.29	785.63	786.37
	July 7-8, 2016	786.31	786.28	784.60	787.36	NI	789.26	787.43	785.19	785.05	785.89
	July 28, 2016	NM	NM	784.35	NM	NI	NM	NM	NM	784.86	785.61
	October 11-13, 2016	787.64	787.76	786.18	788.18	NI	789.78	787.88	787.36	786.45	787.22
	December 29, 2016	787.37	787.05	NM	NM	NI	NM	NM	785.66	785.72	786.63
	January 25-26, 2017	787.27	786.89	785.28	789.34	NI	789.36	789.64	785.88	785.98	786.70
	April 10 & 11, 2017	787.89	787.55	786.00	788.22	NI	789.57	787.95	786.39	786.30	787.16
	June 6, 2017	788.25	788.37	786.49	788.58	NI	789.79	787.83	787.27	786.66	787.63
	August 7-9, 2017	787.34	787.55	785.42	789.52	NI	789.30	788.54	786.11	785.81	786.68
	October 23-24, 2017	785.89	785.94	783.92	788.97	NI	788.14	788.00	784.13	784.50	785.32
	February 21, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	March 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	April 23-25, 2018	785.29	784.37	783.27	789.69	NI	787.67	790.43	783.09	781.77	785.88
	May 24, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	June 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	July 23, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	August 7, 2018	787.06	NM	785.20	788.25	NI	788.56	787.63	NM	NM	786.55
	August 22, 2018	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	September 21, 2018	NM	788.37	786.50	NM	NI	NM	NM	787.90	787.01	NM
	October 22-24, 2018	788.98	789.16	787.51	789.05	NI	790.04	788.47	788.77	787.88	788.32
	April 1-4, 2019	787.04	787.56	786.52	789.72	NI	790.07	789.44	786.63	786.82	787.35
	June 12, 2019	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	June 19, 2019	NM	NM	786.81	NM	NI	NM	NM	NM	NM	NM
	October 7-9, 2019	788.47	788.31	787.02	790.41	NI	790.36	790.65	NM	NM	NM
	December 13, 2019	--	--	--	--	NI	--	--	--	--	--
	December 23, 2019	--	--	--	--	NI	--	--	--	--	--
	January 17, 2020	--	--	785.58	--	NI	--	--	--	--	--
CCR Rule Wells	February 3, 2020	787.24	NM	NM	NM	NI	NM	NM	NM	NM	786.50
	May 27-29, 2020	787.77	787.29	785.56	789.30	NI	787.78	787.73	786.01	785.98	787.02
	June 30, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	August 6, 2020	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	October 7-8, 2020	786.53	786.74	785.16	788.52	NI	787.96	787.74	785.91	785.70	786.10
	December 11, 2020	NM	NM	NM	NM	NI	788.19	NM	NM	NM	NM
	February 25, 2021	NM	NM	784.27	NM	NI	788.36	NM	NM	784.75	NM
	April 12, 2021	786.50	785.77	784.07	787.99	NI	788.11	786.34	784.27	784.77	785.84
	June 11, 2021	NM	NM	NM	NM	NI	NM	NM	784.19	784.66	NM
	July 20, 2021	NM	NM	783.64	NM	NI	788.39	NM	NM	NM	NM
	October 11-12, 14, 2021	785.28	785.09	783.09	787.78	NI	787.75	786.33	783.73	784.42	784.96
	December 21, 2021	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	February 24, 2022	NM	NM	782.34	NM	NI	786.49	NM	NM	NM	NM
	April 11-13, 2022	785.44	784.42	783.40	788.20	NI	787.87	788.26	783.27	784.30	785.02
	July 27, 2022	NM	NM	783.07	NM	NI	787.03	NM	NM	NM	NM
	October 25-27, 2022	784.91	784.62	778.94	781.79	NI	784.97	783.85	781.94	783.61	784.57
	November 30, 2022	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	December 2, 2022	785.12	784.48	NM	783.97	NI	NM	NM	781.91	783.71	784.76
	January 12-13, 2023	785.20	784.55	NM	NM	NI	NM	NM	782.75	784.10	784.88
	January 20, 2023	NM	NM	NM	788.08	NI	NM	NM	NM	NM	NM
	January 24, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	February 20-23, 2023	785.56	784.98	NM	NM	NI	NM	NM	NM	NM	NM
	March 27-28, 2023	786.83	785.87	NM	NM	NI	NM	NM	NM	NM	NM
	April 24-27, 2023	787.57	786.87	784.38	784.03	NI	NM	782.59	785.79	786.22	786.97
	May 5, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	May 16, 2023	787.43	787.07	783.88	784.12	NI	dry	781.64	785.64	786.06	786.88
	May 30-31, 2023	787.04	786.89	NM	NM	NI	NM	NM	NM	NM	NM
	June 29-30, 2023	786.32	786.39	NM	NM	NI	NM	NM	784.32	785.04	785.92
	July 31, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	August 31, 2023	NM	785.30	NM	NM	NI	NM	NM	NM	NM	NM
	October 9-11, 2023	784.67	784.65	781.21	780.09	NI	779.93	780.54	782.57	783.55	784.39
	November 9, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	November 20, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	December 27, 2023	NM	NM	NM	NM	NI	NM	NM	NM	NM	NM
	April 15-17, 2024	785.27	784.49	782.16	aband	782.17	780.80	781.38	783.02	784.14	784.90
	April 19, 2024	785.51	784.55	782.26	aband	782.23	dry	dry	783.06	784.28	785.05
	May 20, 2024	NM	NM	NM	aband	NM	NM	NM	NM	NM	NM
	Bottom of Well Elevation (ft)	777.49	779.40	775.72	779.72	773.61	780.72	766.52	777.21	770.52	774.07

Well Number	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-312	MW-313	MW-314	MW-315	MW-316	MW-317	MW-318	MW-319
Top of Casing Elevation (feet amsl)	807.63	806.89	806.9	813.27	813.62	809.74	826.786	820.3	821.57	819.78	808.49	819.36	820.94	828.77
Screen Length (ft)	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Total Depth (ft from top of casing)	27	26.5	28	37.67	38.41	36.19	52.5	46.2	45.0	45.6	43.7	44.3	43	47.6
Top of Well Screen Elevation (ft)	790.63	790.39	788.90	785.60	785.21	783.55	784.29	784.1	786.6	784.2	774.79	785.1	787.9	791.2
Measurement Date														
December 21-22, 2015	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
April 4-5, 2016	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
July 7-8, 2016	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
July 28, 2016	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
October 11-13, 2016	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
December 29, 2016	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
January 25-26, 2017	785.50	785.36	785.73	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
April 10 & 11, 2017	786.22	785.64	786.51	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
June 6, 2017	786.85	786.07	786.46	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
August 7-9, 2017	785.69	785.19	785.37	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
October 23-24, 2017	783.97	784.79	784.17	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
February 21, 2018	NM	NM	NM	783.19	783.05	783.02	NI	NI	NI	NI	NI	NI	NI	NI
March 23, 2018	NM	NM	NM	783.10	783.10	783.00	NI	NI	NI	NI	NI	NI	NI	NI
April 23-25, 2018	783.24	783.65	782.65	783.07	782.97	781.83	NI	NI	NI	NI	NI	NI	NI	NI
May 24, 2018	785.79	785.09	NM	785.45	785.97	786.11	NI	NI	NI	NI	NI	NI	NI	NI
June 23, 2018	NM	NM	NM	786.03	786.64	786.47	NI	NI	NI	NI	NI	NI	NI	NI
July 23, 2018	NM	NM	NM	786.27	786.35	786.55	NI	NI	NI	NI	NI	NI	NI	NI
August 7, 2018	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
August 22, 2018	NM	NM	NM	785.54	785.40	785.46	NI	NI	NI	NI	NI	NI	NI	NI
September 21, 2018	NM	NM	NM	787.08	787.24	787.66	NI	NI	NI	NI	NI	NI	NI	NI
October 22-24, 2018	787.66	786.57	787.81	787.99	788.18	788.64	NI	NI	NI	NI	NI	NI	NI	NI
April 1-4, 2019	786.72	786.71	787.53	786.30	786.38	786.38	NI	NI	NI	NI	NI	NI	NI	NI
June 12, 2019	NM	NM	NM	NM	787.25	NM	NI	NI	NI	NI	NI	NI	NI	NI
June 19, 2019	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
October 7-9, 2019	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI	NI	NI	NI
December 13, 2019	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
December 23, 2019	--	--	--	--	775.22	--	NI	NI	NI	NI	NI	NI	NI	NI
January 17, 2020	--	--	--	--	--	--	NI	NI	NI	NI	NI	NI	NI	NI
February 3, 2020	785.77	785.57	786.48	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
May 27-29, 2020	785.77	785.35	786.28	785.98	785.81	785.85	NI	NI	NI	NI	NI	NI	NI	NI
June 30, 2020	NM	NM	NM	786.18	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
August 6, 2020	NM	NM	NM	785.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
October 7-8, 2020	785.39	784.71	785.68	785.47	785.56	785.83	NI	NI	NI	NI	NI	NI	NI	NI
December 11, 2020	NM	NM	NM	785.26	785.26	NM	NI	NI	NI	NI	NI	NI	NI	NI
February 25, 2021	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
April 12, 2021	784.32	784.21	785.55	784.29	784.24	784.15	NI	NI	NI	NI	NI	NI	NI	NI
June 11, 2021	NM	NM	NM	784.20	784.05	NM	NI	NI	NI	NI	NI	NI	NI	NI
July 20, 2021	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
October 11-12, 14, 2021	782.93	782.44	783.76	783.65	783.48	783.48	NI	NI	NI	NI	NI	NI	NI	NI
December 21, 2021	NM	NM	NM	782.93	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
February 24, 2022	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
April 11-13, 2022	783.11	783.32	784.19	783.14	783.19	783.04	NI	NI	NI	NI	NI	NI	NI	NI
July 27, 2022	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
October 25-27, 2022	778.32	777.89	784.16	781.50	780.96	781.23	NI	NI	NI	NI	NI	NI	NI	NI
November 30, 2022	NM	NM	NM	781.62	781.14	781.15	NI	NI	NI	NI	NI	NI	NI	NI
December 2, 2022	778.52	779.54	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
January 12-13, 2023	NM	NM	NM	782.57	782.45	782.32	NI	NI	NI	NI	NI	NI	NI	NI
January 20, 2023	782.15	782.11	784.98	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI
January 24, 2023	NM	NM	NM	NM	NM	NM	783.73	783.36	783.63	783.77	NI	NI	NI	NI
February 20-23, 2023	783.04	782.91	785.32	783.31	783.34	783.40	783.50	783.59	783.82	783.96	NI	NI	NI	NI
March 27-28, 2023	NM	NM	NM	783.84	783.98	784.43	NM	784.12	784.41	784.57	NI	NI	NI	NI
April 24-27, 2023	784.82	784.25	787.75	785.05	785.18	785.69	NM	785.21	785.43	785.59	NI	NI	NI	NI
May 5, 2023	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	780.49	NI	NI	NI
May 16, 2023	784.65	783.89	786.88	785.15	785.11	785.39	785.97	785.46	785.68	785.88	780.48	NI	NI	NI
May 30-31, 2023	NM	NM	NM	784.90	784.69	784.97	NM	785.24	785.55	785.77	NM	NI	NI	NI
June 29-30, 2023	NM	NM	NM	784.12	783.84	783.97	NM	784.67	784.95	785.17	NM	NI	NI	NI
July 31, 2023	NM	NM	NM	NM	NM	NM	NM	783.96	784.26	784.49	NM	NI	NI	NI
August 31, 2023	NM	NM	NM	NM	782.47	NM	NM	783.55	783.83	783.97	NM	NI	NI	NI
October 9-11, 2023	NM	NM	783.09	782.58	782.32	782.22	783.69	783.10	783.33	783.59	780.30	NI	NI	NI
November 9, 2023	NM	NM	NM	782.76	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
November 20, 2023	781.97	781.45	782.85	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
December 27, 2023	NM	NM	NM	NM	NM	NM	NM	NM	783.18	783.36	NM	NI	NI	NI
April 15-17, 2024	782.40	782.24	784.51	782.79	782.68	782.64	783.59	783.16	783.42	783.53	782.09	783.60	783.62	785.76
April 19, 2024	NM	782.64	784.69	782.90	782.82	782.74	783.68	783.30	783.49	783.62	782.15	NM	NM	NM
May 20, 2024	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.25	NM	NM	NM	NM
Bottom of Well Elevation (ft)	780.63	780.39	778.90	775.60	775.21	773.55	774.29	774.10	776.61	774.18	764.79	775.06	777.94	781.17

Notes:
NM = not measured
NI = not installed
aband = abandoned
(1) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5, 2017 sampling event. The level was allowed to return to static and was measured on October 10, 2017.
(2) 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'.
(3) A supplemental water level measurement event was conducted on April 19, 2024.

Created by: MDB Date: 5/6/2013
Last revision by: RM Date: 8/19/2024
Checked by: BLR Date: 8/21/2024

Figures

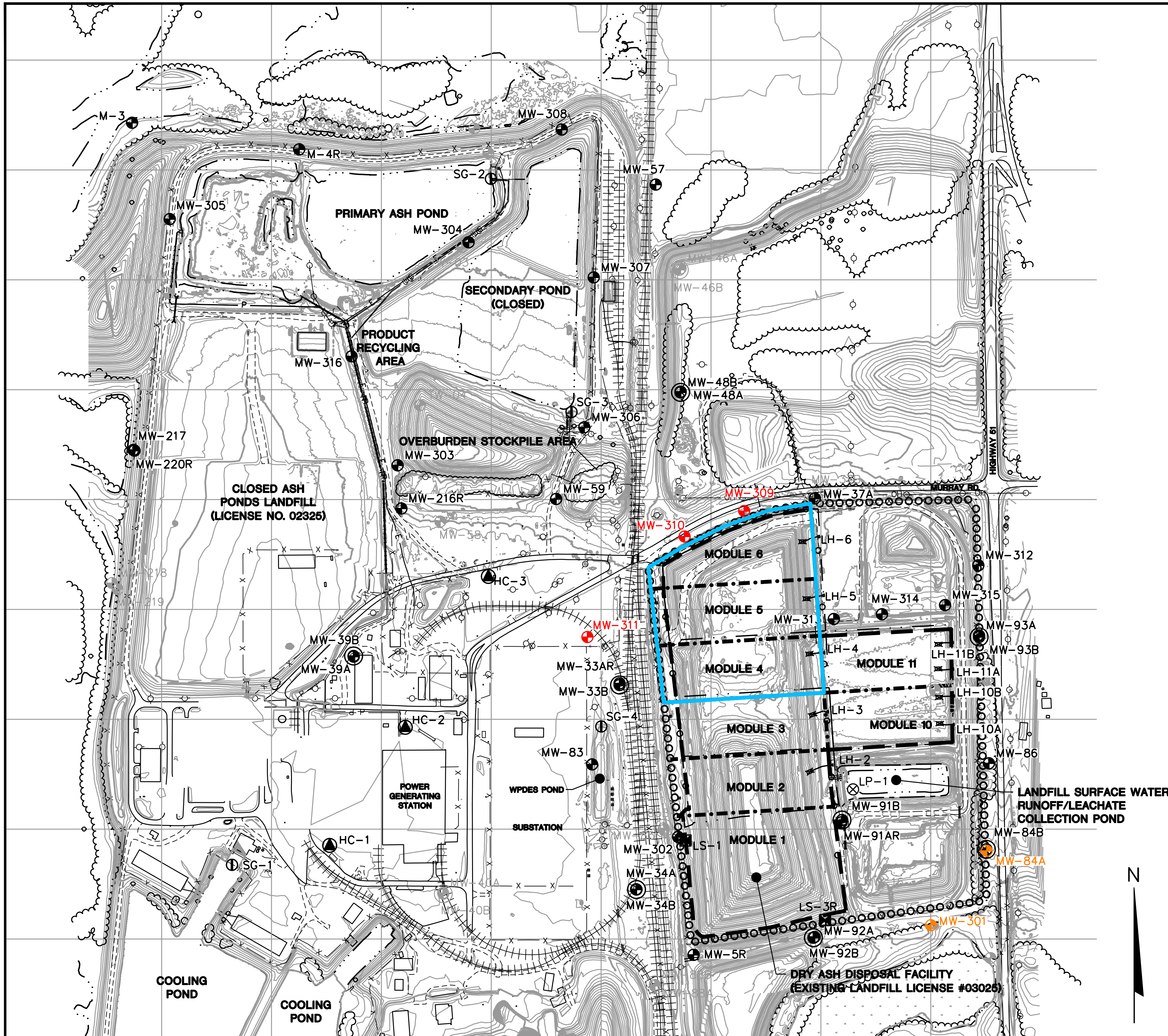


POYNETTE QUADRANGLE
WISCONSIN–COLUMBIA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'

CLIENT	SITE	
ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI	SITE LOCATION MAP

				ENGINEER	FIGURE
PROJECT NO.	25220067.00	DRAWN BY:	BSS	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	1
DRAWN:	12/02/2019	CHECKED BY:	MDB		
REVISED:	01/10/2020	APPROVED BY:	TK 04/10/2020		

I:\25220067.00\Drawings\ASD Mod 1-3 LF\Site Location Map.dwg, 4/12/2020 7:05:09 PM



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

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
8. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
9. BACKGROUND MONITORING WELLS FOR THE MODULES 4-6 DRY ASH DISPOSAL FACILITY ARE: MW-301 AND MW-84A.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	04/24/2024	APPROVED BY:	TK 05/10/2024

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

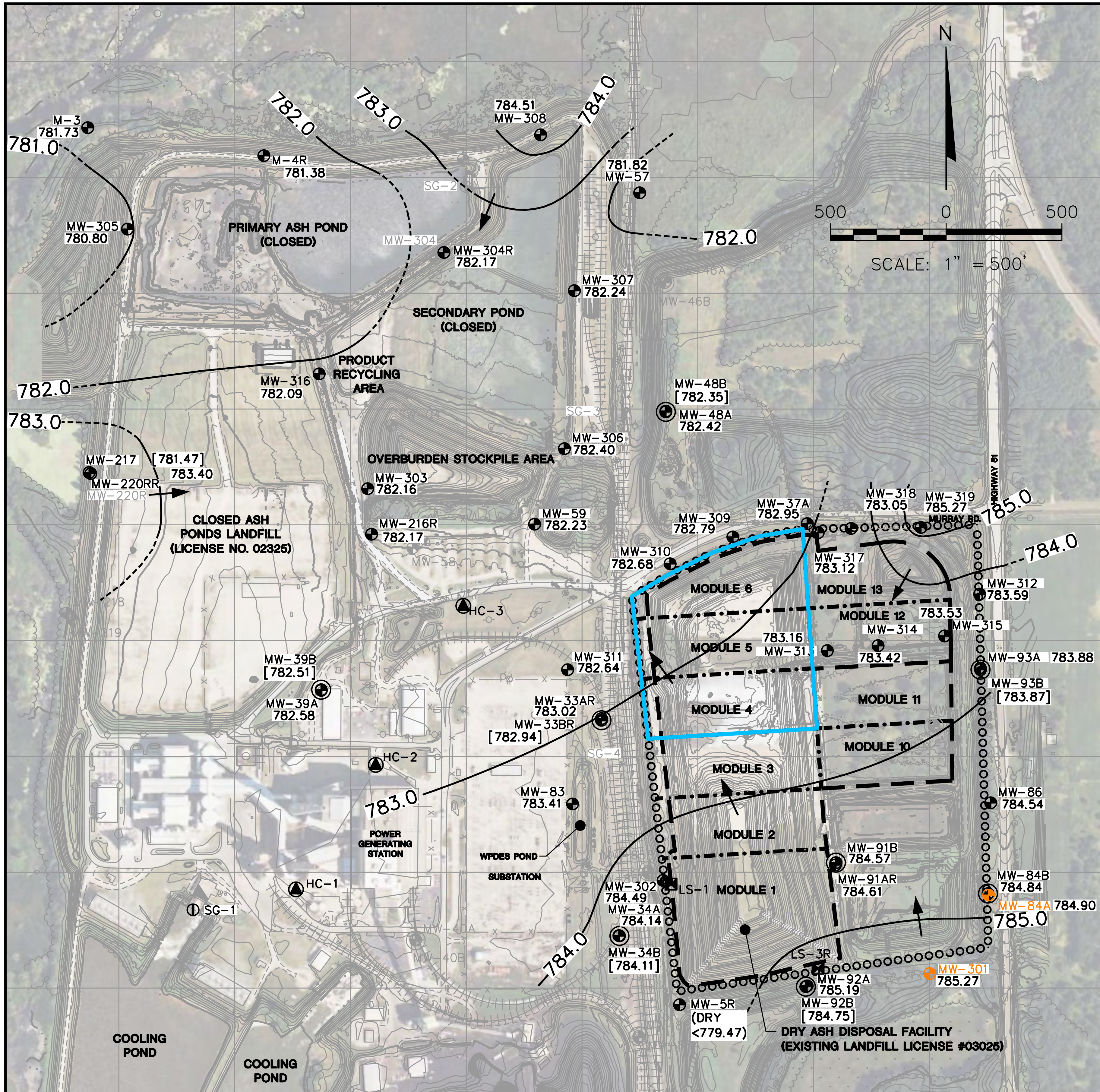
CLIENT: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, W8375 MURRAY ROAD, PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY, COLUMBIA ENERGY CENTER, MODULES 4-6 DRY ASH DISPOSAL FACILITY, PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25224067.00\Drawings\Modules 4-6\Site Plan and Monitoring Well Locations.dwg, 4/25/2024 7:18:14 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
- LINER PHASE/MODULE LIMITS
- WATER SUPPLY WELL
- STAFF GAUGE
- WATER TABLE WELL
- PIEZOMETER
- LYSIMETER
- ABANDONED WATER TABLE WELL
- ABANDONED PIEZOMETER
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- 783.88 WATER TABLE ELEVATION
- [781.47] POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
- (DRY) SURFACE WATER ELEVATION (NOT CONTOURED)
- WATER TABLE CONTOUR (1-FOOT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- CCR UNIT

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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 PRIMARY ASH POND 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.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
10. MONITORING WELLS MW-317, MW-318 AND MW-319 WERE INSTALLED BY HORIZON CONSTRUCTION 7 EXPLORATION ON APRIL 9 THROUGH 11, 2024.

PROJECT NO.	25224067.00	DRAWN BY:	SB
DRAWN:	11/05/2024	CHECKED BY:	NLB/BRK
REVISED:	10/25/2024	APPROVED BY:	BRK (10/30/2024)

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
PRIMARY ASH POND
PARDEEVILLE, WI

WATER TABLE CONTOUR MAP
APRIL 15-17, 2024
MODULES 4-6

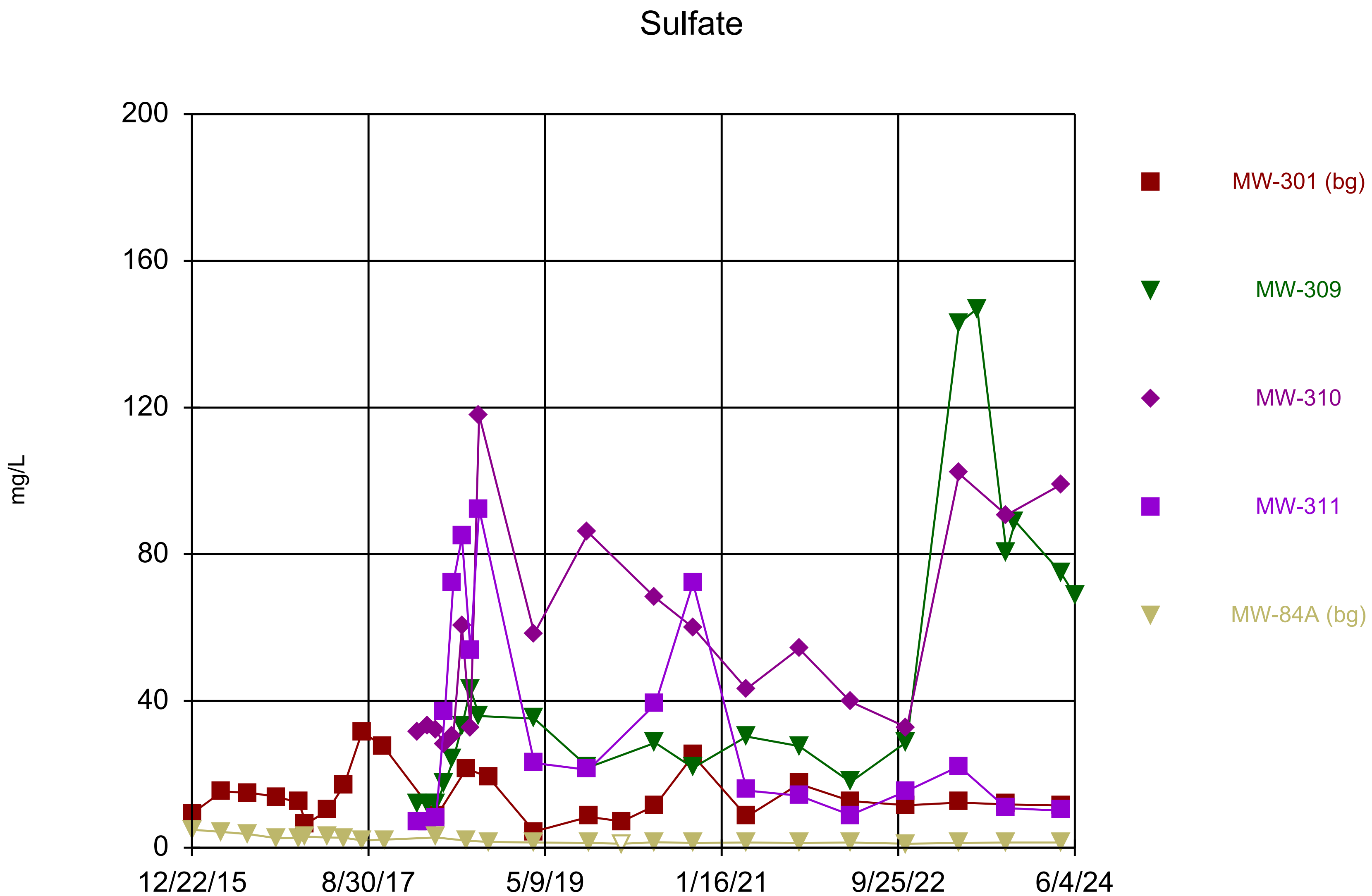
FIGURE 3

I:\25224067.00\Drawings\COL April 2024 WTBL CCR Units.dwg, 11/5/2024 1:00:49 PM

Appendix A

Trend Plots for CCR Wells

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.



Time Series Analysis Run 7/5/2024 10:25 AM View: Mod 10-11

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L)   Analysis Run 7/5/2024 10:29 AM   View: Mod 10-11

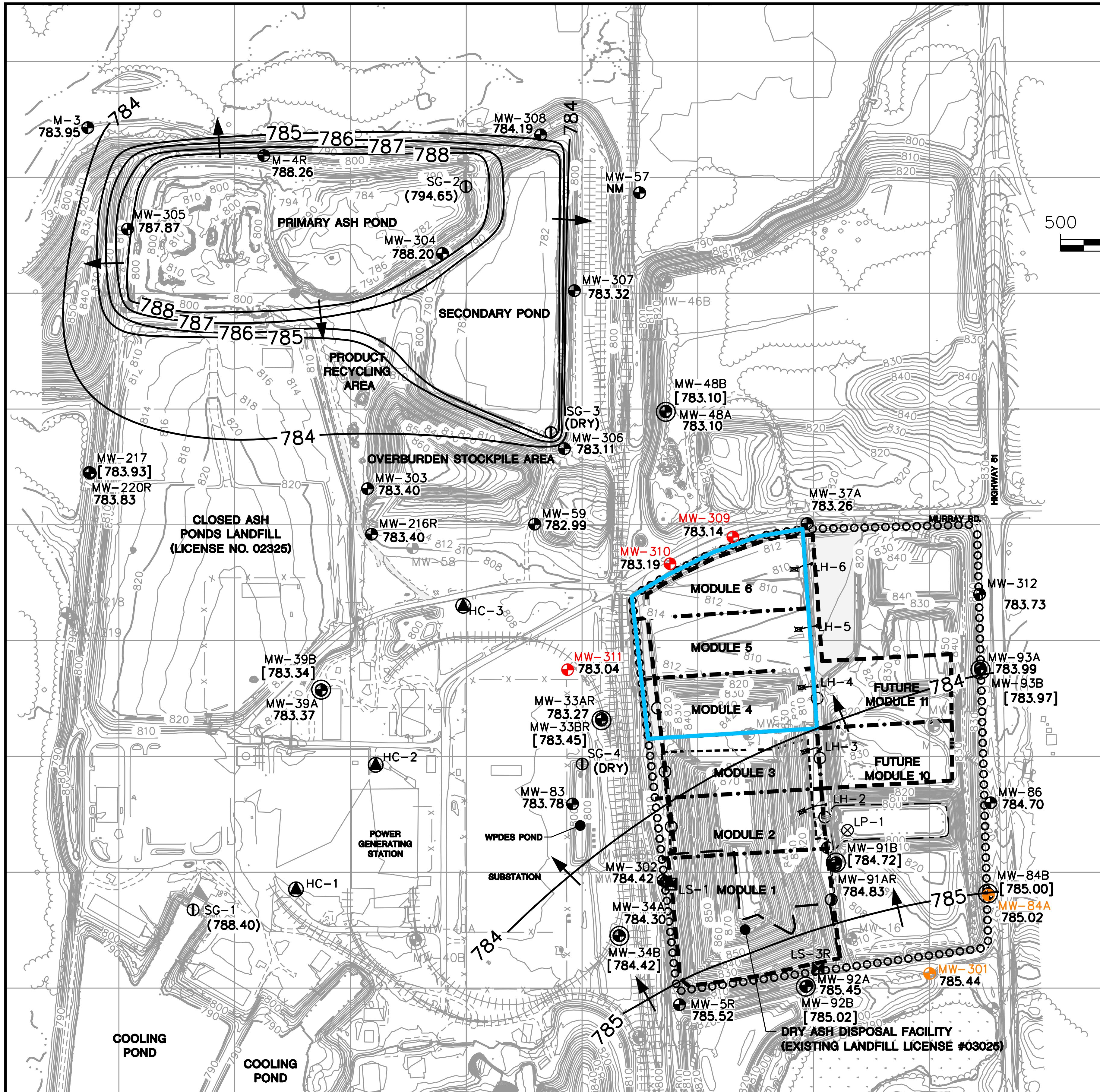
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	9.3				4.9
4/5/2016	15.3				4.3
7/8/2016	15				3.7 (J)
10/13/2016	13.9				2.6 (J)
12/29/2016	12.3 (J)				2.7 (J)
1/25/2017	6.5				3
4/11/2017	10.3				2.8 (J)
6/6/2017	17.1				2.7 (J)
8/8/2017	31.6				2 (J)
10/23/2017	27.5				
10/24/2017					2.2 (J)
2/21/2018		12.2	31.6	7.1	
3/23/2018		12.2	33.1	7.2	
4/23/2018		12	32	7.9	
4/25/2018	8.6				2.8 (J)
5/24/2018		17.5	28	36.9	
6/23/2018		24.1	30.4	72.3	
7/23/2018		33.1	60.2	84.7	
8/8/2018	21.6				1.9 (J)
8/22/2018		43.3	32.8	53.6	
9/21/2018		35.9	118	92.4	
10/24/2018	19.2				1.6 (J)
4/2/2019	4.4	35.2	58.4	23.1	
4/3/2019					1.4 (J)
10/8/2019		21.9	85.9	21.2	
10/9/2019	8.4				1.3 (J)
2/3/2020	7.2				<2.2 (U)
5/29/2020	11.5	28.6	68.2	39.1	1.5 (J)
10/8/2020	25.1	21.8	60	72.1	1.3 (J)
4/13/2021		30.3	43.3		
4/14/2021	8.5			15.6	1.4 (J)
10/14/2021	17.4	27.7	54.3	14.2	1.3 (J)
4/12/2022		17.9	39.8	8.9	
4/13/2022	12.7				1.4 (J)
10/26/2022		28.9	32.8		
10/27/2022	11.6			15.5	1.1 (J)
4/26/2023		143 (O)	102	22.2	
4/27/2023	12.3				1.3 (J)
6/29/2023		147 (O)			
10/9/2023		80.6	90.7	10.8	
10/11/2023	11.8				1.4 (J)
11/9/2023		89			
4/15/2024		75.1	98.9	10.1	
4/17/2024	11.5				1.4 (J)
6/4/2024		68.8			

ND substitution: RL or RL/2 if <15% NDs.

Appendix B

Historical Water Table Maps



LEGEND

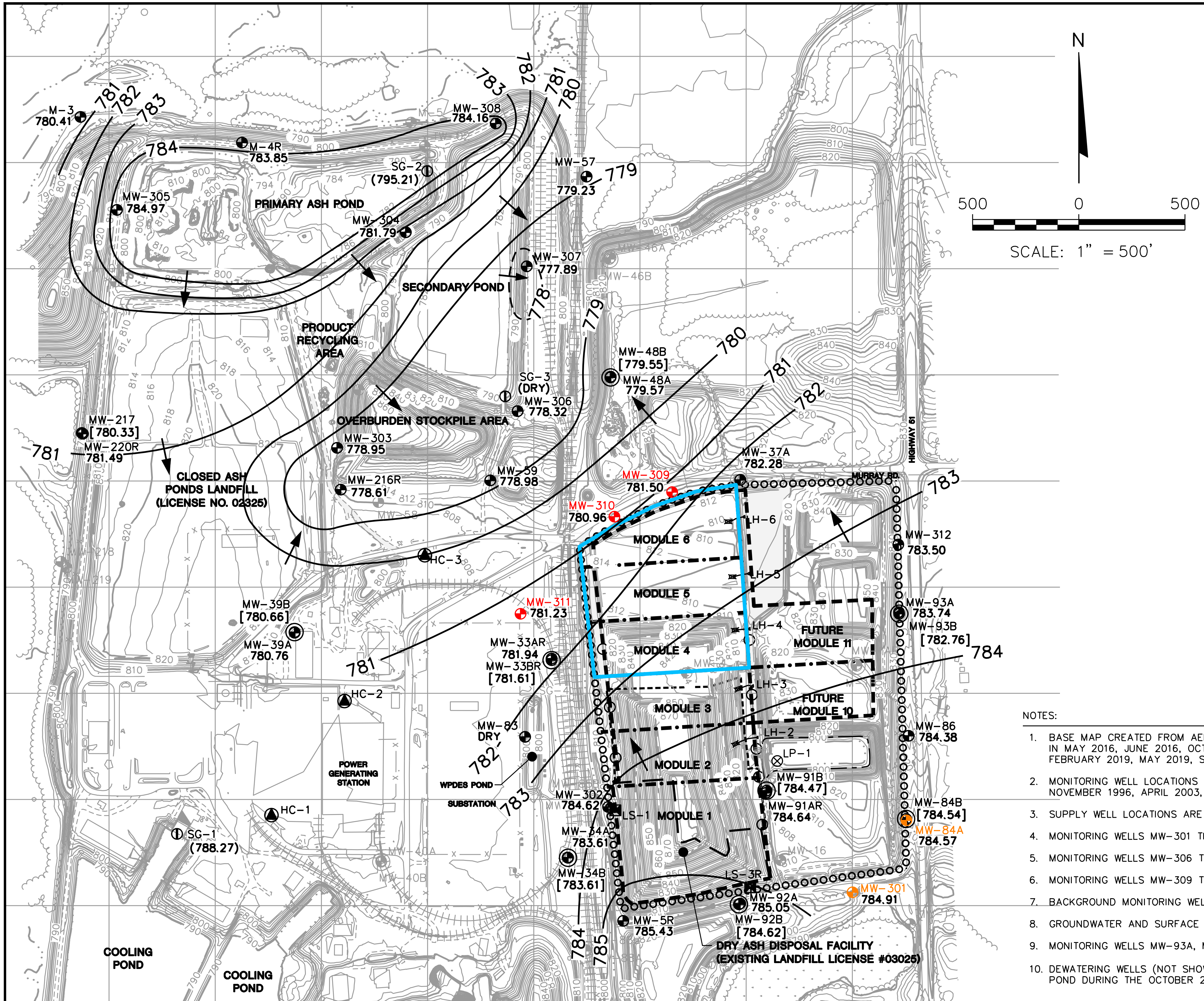
	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
	DRY ASH DISPOSAL FACILITY LIMITS
	LIMITS OF WASTE
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE WELL
	PIEZOMETER
	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

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, MAY 2019, SEPTEMBER 2020, AUGUST 2021, AND NOVEMBER 2021.
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. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 11-13, 2022.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
10. MW-57 WAS INACCESSIBLE DURING THE APRIL 2022 EVENT DUE TO HIGH WATER.

PROJECT NO.	25224067.00	DRAWN BY:	KP	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 MODULES 4-6 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI
DRAWN:	12/02/2019	CHECKED BY:	MDB					WATER TABLE MAP APRIL 2022
REVISED:	04/24/2024	APPROVED BY:	TK 12/13/2024					FIGURE 3

I:\25224067.00\Drawings\Modules 4-6\3_Water Table Map-April 2022.dwg, 4/25/2024 7:31:08 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
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- 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

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, MAY 2019, SEPTEMBER 2020, AUGUST 2021, AND NOVEMBER 2021.
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.
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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. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON OCTOBER 25-27, 2022.
9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
10. DEWATERING WELLS (NOT SHOWN) AROUND THE SECONDARY POND WERE PUMPING AND DISCHARGING TO THE PRIMARY POND DURING THE OCTOBER 2022 SAMPLING EVENT.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	MDB
REVISED:	04/24/2024	APPROVED BY:	TK 12/13/2024

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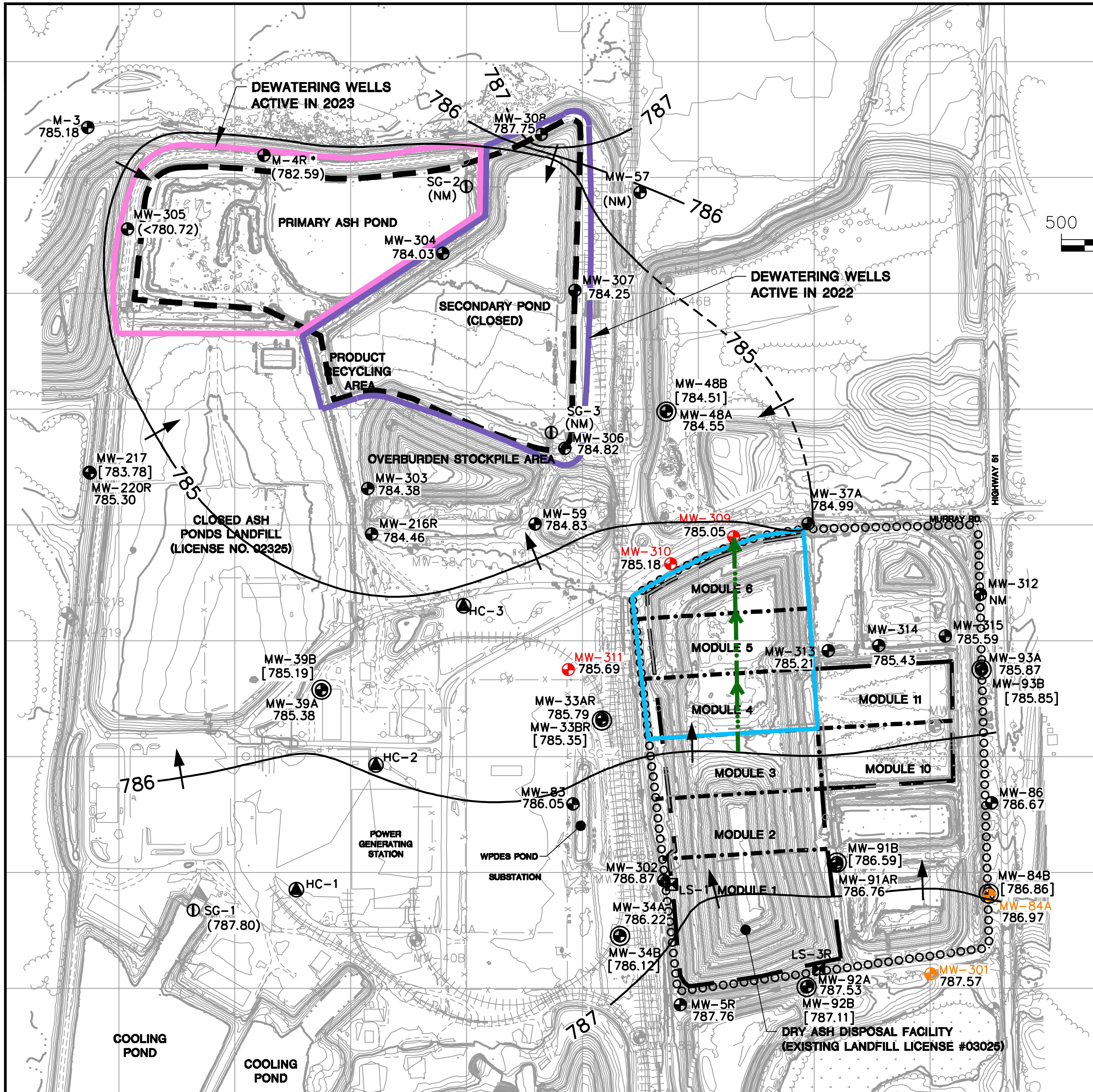
W8375 MURRAY ROAD
PARDEEVILLE, WI 53954

SITE: ALLIANT ENERGY
COLUMBIA ENERGY CENTER
MODULES 4-6 DRY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2022

FIGURE 4

I:\25224067.00\Drawings\Modules 4-6\Water Table Map-October 2022.dwg, 4/25/2024 7:38:39 AM



N

500 0 500

SCALE: 1" = 500'

LEGEND

	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
—x—x—	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
oooooooo	DRY ASH DISPOSAL FACILITY LIMITS
	LIMITS OF WASTE
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE WELL
	PIEZOMETER
	LYSIMETER
	ABANDONED WATER TABLE WELL
	ABANDONED PIEZOMETER
	CCR UNIT
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
	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
	PRIMARY POND DEWATERING WELLS ACTIVE IN 2023
	SECONDARY POND DEWATERING WELLS ACTIVE IN 2022

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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 4-6 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.
8. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
9. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED ON APRIL 24-27, 2023.
11. DEWATERING WELLS WERE ACTIVE AROUND THE PRIMARY POND DURING THE APRIL 2023 SAMPLING EVENT.
12. THE GROUNDWATER ELEVATION FOR M-4R (*) WAS NOT USED FOR CONTOURING OF THE WATER TABLE (SHALLOW) DUE TO ADJACENT PUMPING AND DEWATERING ACTIVITIES.

PROJECT NO.	25223067.00	DRAWN BY:	KP
DRAWN:	10/12/2023	CHECKED BY:	NLB
REVISED:	01/22/2024	APPROVED BY:	TK 1/29/2024

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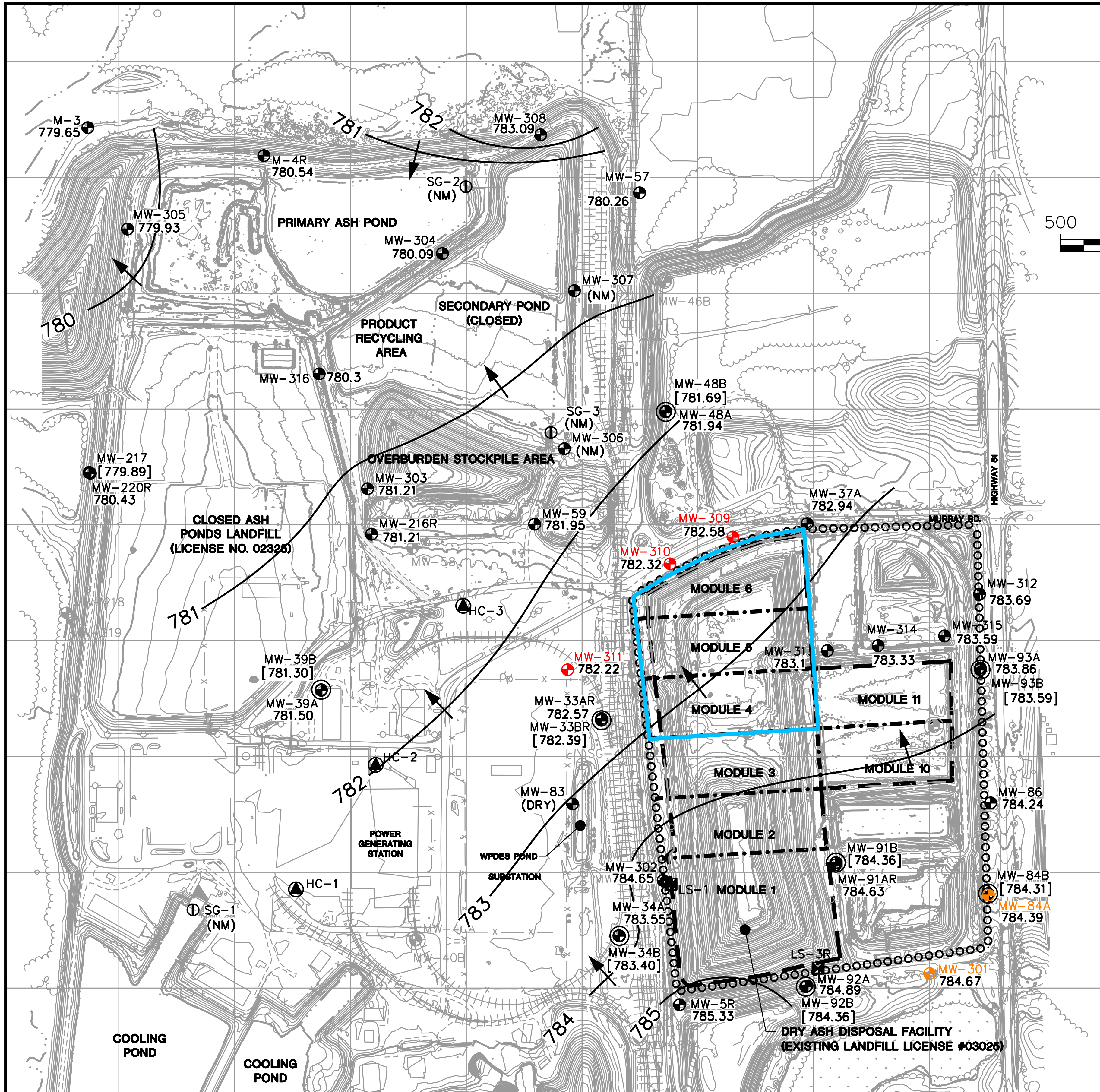
WATER TABLE MAP
APRIL 2023

FIGURE 3

I:\25223067.00\Drawings\Module 4\Water Table Map-April 2023.dwg, 1/22/2024 9:41:17 AM



N

500 0 500

SCALE: 1" = 500'

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
	LYSIMETER
	ABANDONED WATER TABLE WELL
	ABANDONED PIEZOMETER
	CCR UNIT
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
787.62	WATER TABLE ELEVATION
[788.87]	POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
(NM)	NOT MEASURED
	WATER TABLE CONTOUR
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
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. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
8. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
9. MONITORING WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
10. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 2023.
11. DEWATERING PUMPING WAS STOPPED BY SEPTEMBER 11, 2023.

PROJECT NO.	25224067.00	DRAWN BY:	KP
DRAWN:	11/13/2023	CHECKED BY:	TK
REVISED:	04/24/2024	APPROVED BY:	TK 05/10/2024

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MODULES 4-6 DRY ASH DISPOSAL FACILITY
PARDEEVILLE, WI

WATER TABLE MAP
OCTOBER 2023

FIGURE
3

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Appendix F

Updated UPL Memorandum

September 4, 2024
File No. 25224067.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results
COL Mod 4-6 Landfill, 2024 Update

PREPARED BY: Ryan Matzuk

CHECKED BY: Sherren Clark

STATISTICAL METHOD

The statistical analysis uses a prediction interval approach as recommended for detection monitoring in the March 2009 United States Environmental Protection Agency (U.S. EPA) Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities. For the prediction interval evaluation, intrawell testing was selected based on the considerations outlined in Chapter 6 of the Unified Guidance. The statistical program used to calculate the intrawell prediction interval is Sanitas™ (Version 10.0.16). Under the intrawell approach, detection monitoring results are compared to upper prediction limits (UPLs) calculated based on background monitoring results from the same wells.

Eight rounds of background monitoring were performed prior to CCR disposal in the Mod 4-6 CCR landfill. The background wells for Mod 4-6 (MW-84A and MW-301) are shared background wells for all of the COL CCR units. Compliance wells for Mod 4-6 include MW-309, MW-310, and MW-311. For the Mod 4-6 compliance wells, background monitoring was performed from February 2018 through September 2018. Because the Mod 4-6 evaluation is intrawell, the background well data is not used in the statistical evaluation, but is available for use in data interpretation as needed.

Prior to October 2019, statistical analyses at Mod 4-6 used an intrawell UPL without retesting, calculated using ChemStat software. The October 2019 event and future events have used an intrawell UPL with 1-of-2 retesting, calculated using Sanitas software. The retesting approach results in a slightly lower UPL, but only 1 of 2 samples collected for the event (original and retest) must meet the UPL to demonstrate compliance.

TIME SERIES PLOTS

Time series plots were prepared for the required detection monitoring parameters to show the concentration variations over time, and are included in **Attachment 1**. The time series plots include the three compliance wells and two background wells for Mod 4-6.

OUTLIER ANALYSIS

For the intrawell evaluation, an outlier analysis was performed for the background monitoring results at each of the three compliance wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1) Run normality test (Shapiro Wilk)
   a) If not normal, transform to natural log and test for lognormal distribution.

2) If normally or lognormally distributed, run U.S. EPA's 1989 Outlier Test to identify suspected outliers:
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3) If not normally distributed, run Tukey's test for outliers.

4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

The Sanitas output for the outlier analysis is provided in **Attachment 2**.

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors. However, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the evaluation of data collected prior to 2024, the following background values were identified as potential outliers and handled as described:

- **Field pH (MW-310).** One high result from the April 2019 sampling event was flagged as a statistical outlier. This result was removed from the data set because it was significantly higher than other historical results. Results of a resample for field pH at MW-310 in June 2019 suggested that dissolved oxygen and field pH values had been accidentally switched by field personnel during the April 2019 sampling event.

- **Sulfate (MW-309).** Two high results from the April 2023 and June 2023 sampling events were flagged as statistical outliers. These results were removed from the dataset because higher sulfate concentrations during this time period were attributed to groundwater flow changes associated with dewatering for the Primary and Secondary Pond closures.

BACKGROUND UPDATE

The background data pool for Appendix III parameters was updated in accordance with the Unified Guidance. Prior to expanding the data pool, the original background data set (2/2018 through 9/2018) and the data to be added (4/2019 through 10/2023) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1 percent level of significance. The statistical comparison between the two background data sets was performed for parameters with a least one result above the limit of quantitation, which included all Appendix III parameters except fluoride.

The Wilcoxon rank-sum analysis for the COL background data sets, included in **Attachment 3**, indicated no signficant difference at the 1 percent level, except for the following:

- **Boron (MW-309).** Concentrations shifted upward in 2020, but are still lower than background concentrations at adjacent well MW-310 and do not show an increasing trend since then. Results appear representative of variability in the aquifer and Alternative Source Demonstrations have been completed for statistically significant increases identified based in initial UPLs. Use all data.

- **Chloride (MW-311).** Concentrations have decreased, but all concentrations are low (less than 4 mg/L). Use all data.

- **Field pH (MW-310).** pH values have decreased slightly (approximately 0.1 pH unit shift in median). Use all data.

INTRAWELL PREDICTION LIMITS

Intrawell upper prediction limits (UPLs) were calculated using background data from the compliance wells for each monitored constituent, with outliers handled as noted above. The prediction limit analysis performed in Sanitas includes the following steps:

1) If more than 50 percent of results are non-detect, apply a non-parametric UPL. For small background sample sizes, the non-parametric UPL is the highest background value. For a parameter with 100 percent non-detects in the background values, the Double Quanitification rule applies, which says that an statistically significant increase (SSI) occurs when two results exceeding the quantification limit are reported for a compliance well.

2) If 50 percent or fewer of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

3) If normal or transformed normal, calculate parametric UPL.

4) If not normal or transformed normal, calculate non-parametric UPL.

Consistent with the Unified Guidance, parametric prediction limits were calculated based on a 1-of-2 retesting protocol and a target 10 percent annual site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the analysis of data collected through October 2023, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	April and October events
Constituents analyzed	6	Total of 7 constituents analyzed for detection monitoring. Fluoride not counted because all background results were non-detect
Compliance wells	3	MW-309, MW-310, MW-311

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. The non-parametric limit is the highest value in the background dataset. Due to the small sample size, the false positive rate for the non-parametric tests is higher than for the parametric tests, but will go down as more background data are obtained.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a SSI has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or quanitification limit. For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were replaced with a value of one-half the detection limit. For all parameters, only results at or above the laboratory's reporting limit or quanitification limit are compared to the UPL for SSI determination.

Intrawell prediction limit analysis results are included in **Attachment 4.**

A summary of the new UPLs in comparison to the previous UPLs is provided in **Attachment 5.**

RM/SCC/REO

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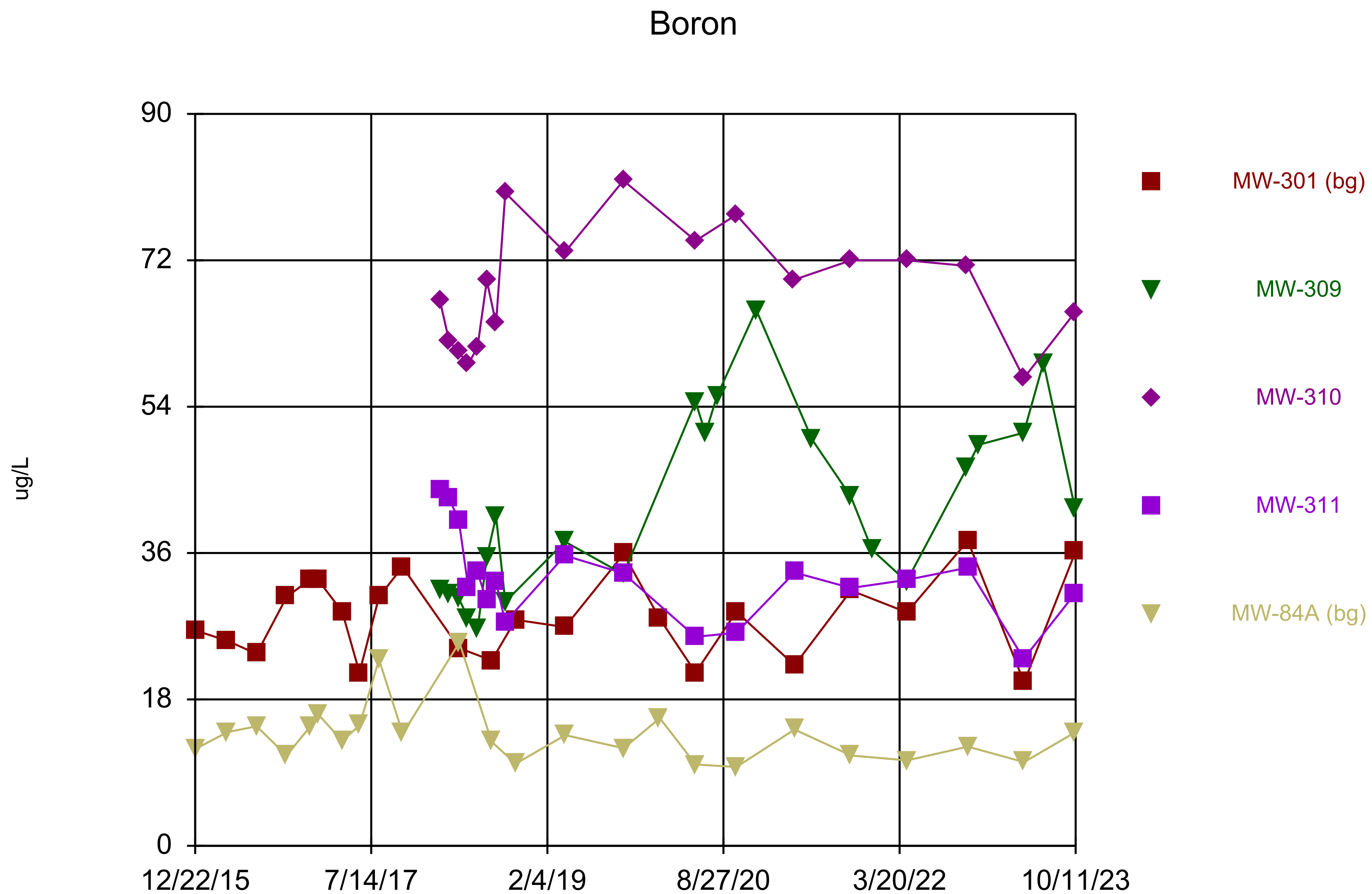
Attachment 1

Times Series Plots



Time Series Analysis Run 3/15/2024 1:50 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 3/15/2024 1:51 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	26.5				11.9
4/5/2016	25.2				14
7/8/2016	23.6				14.7
10/13/2016	30.6				11.1
12/29/2016	32.8				14.7
1/25/2017	32.6				16.1
4/11/2017	28.8				12.9
6/6/2017	21.3				14.8
8/8/2017	30.6				22.9
10/23/2017	34.3				
10/24/2017					13.8
2/21/2018		31.4	67.1	43.7	
3/23/2018		31	62.1	42.7	
4/23/2018		30.4	60.7	40.1	
4/25/2018	24.3				25
5/24/2018		28	59.2	31.7	
6/23/2018		26.6	61.4	33.6	
7/23/2018		35.5	69.5	30.1	
8/8/2018	22.8				12.8
8/22/2018		40.5	64.2	32.4	
9/21/2018		30	80.3	27.5	
10/24/2018	27.8				10.1 (J)
4/2/2019	26.9	37.4	73	35.7	
4/3/2019					13.6
10/8/2019		33.4	81.8	33.5	
10/9/2019	35.9				12
2/3/2020	27.9				15.7
5/29/2020	21.3	54.6	74.4	25.7	10
6/30/2020		50.7			
8/6/2020		55.3			
10/8/2020	28.8		77.6	26.2	9.7 (J)
12/11/2020		65.9 (R)			
4/13/2021			69.6		
4/14/2021	22.2			33.6	14.3
6/11/2021		49.9 (R)			
10/14/2021	31.4	42.9	72	31.7	11.1
12/21/2021		36.4			
4/12/2022		32.5	72	32.7	
4/13/2022	28.7				10.5
10/26/2022		46.6	71.3		
10/27/2022	37.5			34.2	12.2
11/30/2022		49.3			
4/26/2023		50.8	57.5	23	
4/27/2023	20.1				10.3
6/29/2023		59.4			
10/9/2023		41.5	65.6	31	
10/11/2023	36.2				14

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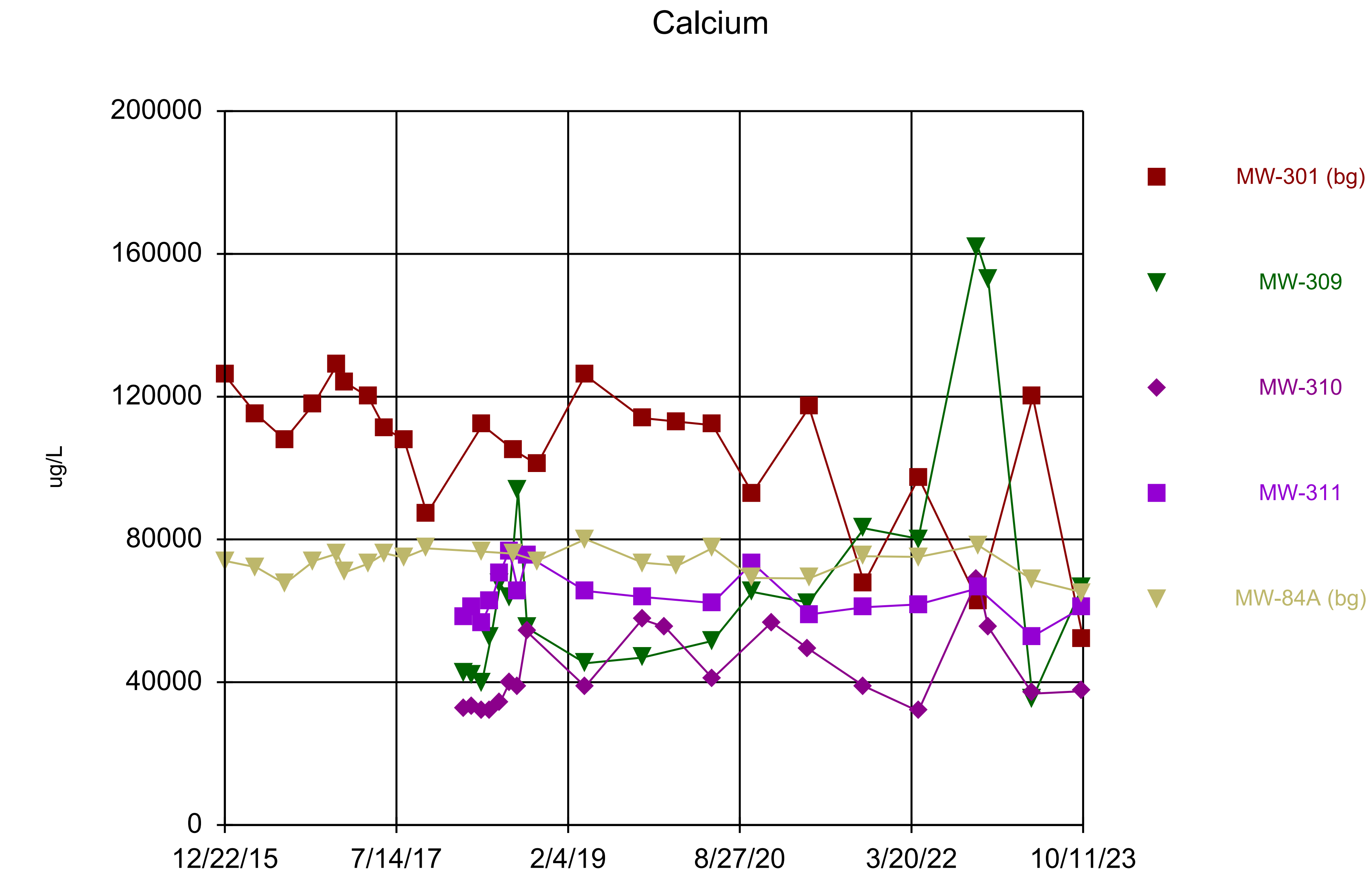

Time Series   Analysis Run 3/15/2024 1:50 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Time Series

Constituent: Calcium (ug/L)   Analysis Run 3/15/2024 1:51 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	126000				74000
4/5/2016	115000				72200
7/8/2016	108000				67600
10/13/2016	118000				74000
12/29/2016	129000				76000
1/25/2017	124000				70800
4/11/2017	120000				73200
6/6/2017	111000				76100
8/8/2017	108000				74900
10/23/2017	87200				
10/24/2017					77500
2/21/2018		42700	32400	58000	
3/23/2018		41800	33400	61000	
4/23/2018		39600	32100	56600	
4/25/2018	112000				76600
5/24/2018		52700	32100	62500	
6/23/2018		67600	34300	70700	
7/23/2018		63800	39700	76800	
8/8/2018	105000				76000
8/22/2018		93600	38800	65700	
9/21/2018		55200	54100	75400	
10/24/2018	101000				74000
4/2/2019	126000	45300	38800	65600	
4/3/2019					80100
10/8/2019		46900	57600	63900	
10/9/2019	114000				73500
12/23/2019			55400		
2/3/2020	113000				72700
5/29/2020	112000	51600	41100	62200	77600
10/8/2020	93000	65300		73400	69200
12/11/2020			56800 (R)		
4/13/2021		62300	49300		
4/14/2021	117000			59000	69100
10/14/2021	67800	83100	38900	61000	75300
4/12/2022		80200	31900	61800	
4/13/2022	97300				75100
10/26/2022		162000	68900		
10/27/2022	62800			66300	78400
11/30/2022		153000	55500		
4/26/2023		35500	36800	52800	
4/27/2023	120000				68600
10/9/2023		66800	37500	60900	
10/11/2023	52300				65100

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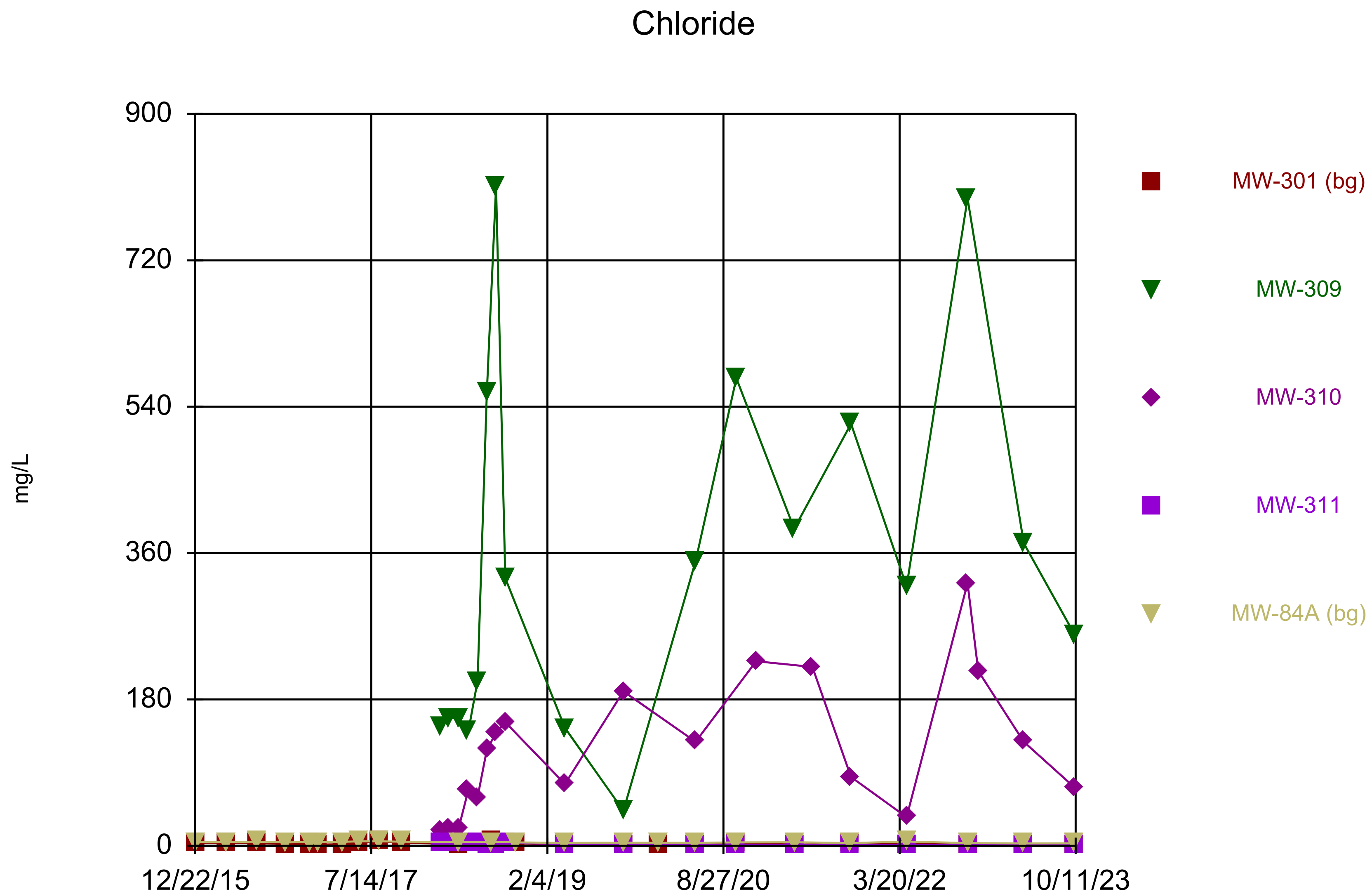

Time Series Analysis Run 3/15/2024 1:50 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Chloride (mg/L)   Analysis Run 3/15/2024 1:51 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	3.7 (J)				4.9
4/5/2016	4				4.7
7/8/2016	3.5 (J)				5.1
10/13/2016	2.2				4.3
12/29/2016	2 (J)				4.7
1/25/2017	1.5 (J)				4.6
4/11/2017	2				4.9
6/6/2017	3.5				5.5
8/8/2017	5.5				5.5
10/23/2017	4				
10/24/2017					5.1
2/21/2018		147	19.8	2.9	
3/23/2018		157	21.7	2.7	
4/23/2018		157	22.1	2.6	
4/25/2018	2.3				4.8
5/24/2018		141	68.6	3.5	
6/23/2018		203	59.8	3	
7/23/2018		557	118	2 (J)	
8/8/2018	5.2				4.9
8/22/2018		811	139	2 (J)	
9/21/2018		329	152	3.9	
10/24/2018	3.2				4.2
4/2/2019	0.79 (J)	145	76	1.9 (J)	
4/3/2019					3.6
10/8/2019		43.2	190	1.5 (J)	
10/9/2019	1.7 (J)				3.9
2/3/2020	1.3 (J)				3.7
5/29/2020	2 (J)	350	128	1.5 (J)	3.7
10/8/2020	3.4	575		1.4 (J)	4.3
12/11/2020			227 (R)		
4/13/2021		390			
4/14/2021	1.5 (J)			1.3 (J)	4.4
6/11/2021			220 (R)		
10/14/2021	2.7	519	84.6	1.3 (J)	3.5
4/12/2022		319	35.2	1 (J)	
4/13/2022	1.9 (J)				5.2
10/26/2022		796	323		
10/27/2022	2.3			1.2 (J)	3.4
11/30/2022			215		
4/26/2023		372	128	2.1	
4/27/2023	1.5 (J)				3
10/9/2023		259	71.3	2 (J)	
10/11/2023	2.1				3.1

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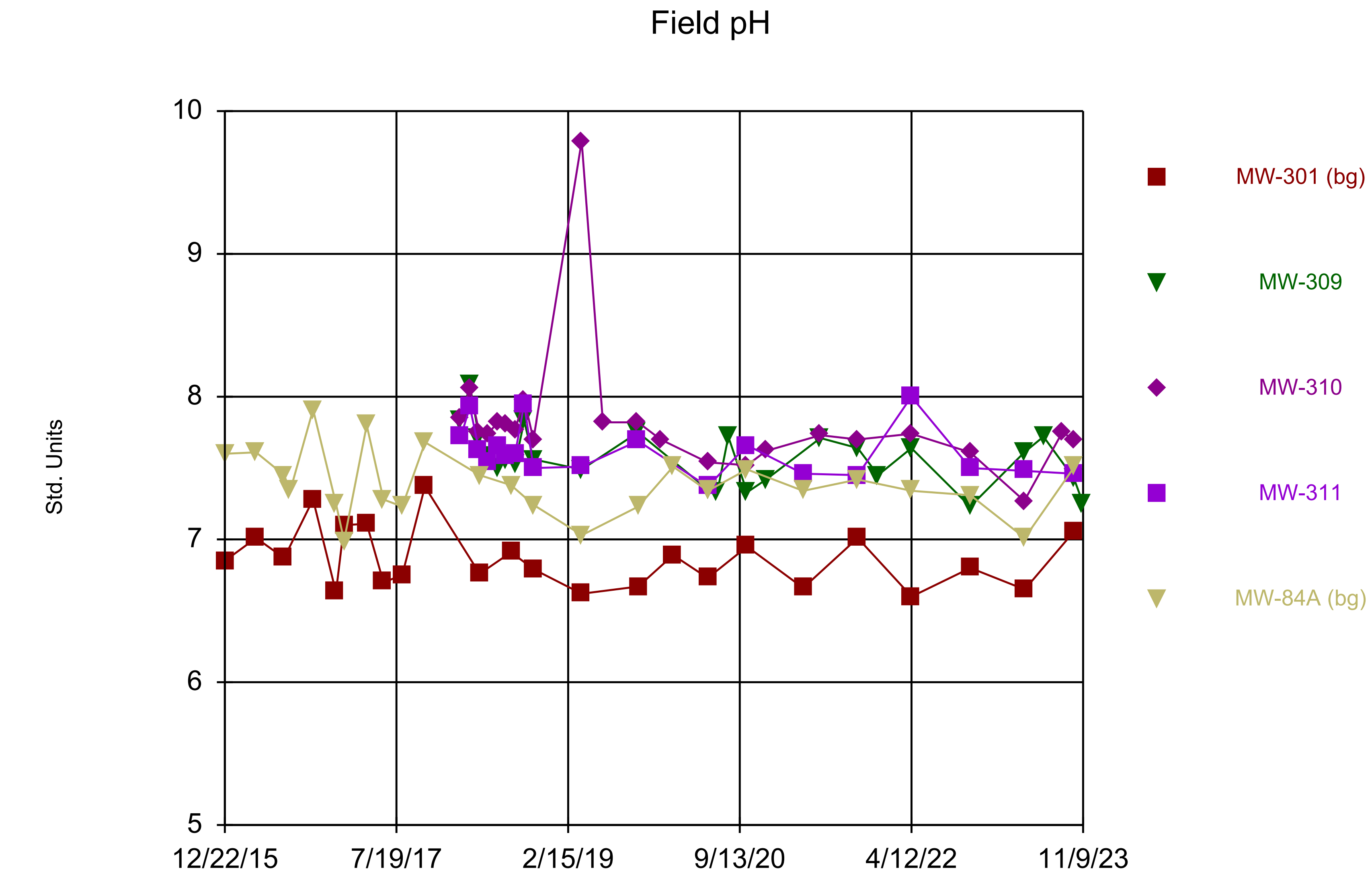

Time Series Analysis Run 3/15/2024 1:50 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Field pH (Std. Units)   Analysis Run 3/15/2024 1:51 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	6.85				7.6
4/5/2016	7.01				7.61
7/8/2016	6.87				7.45
7/28/2016					7.34
10/13/2016	7.28				7.91
12/29/2016	6.63				7.25
1/25/2017	7.1				6.99
4/11/2017	7.11				7.8
6/6/2017	6.7				7.28
8/8/2017	6.75				7.23
10/23/2017	7.37				
10/24/2017					7.68
2/21/2018		7.84	7.85	7.72	
3/23/2018		8.08	8.06	7.93	
4/23/2018		7.71	7.75	7.62	
4/25/2018	6.76				7.45
5/24/2018		7.59	7.74	7.54	
6/23/2018		7.5	7.82	7.65	
7/23/2018		7.55	7.81	7.59	
8/8/2018	6.91				7.38
8/22/2018		7.53	7.77	7.6	
9/21/2018		7.83	7.98	7.95	
10/22/2018		7.56	7.7	7.5	
10/24/2018	6.79				7.24
4/2/2019	6.62	7.49	9.79 (OX)	7.51	
4/3/2019					7.03
6/12/2019			7.82		
10/8/2019		7.75	7.82	7.69	
10/9/2019	6.67				7.23
12/23/2019			7.7		
2/3/2020	6.89				7.51
5/29/2020	6.73	7.35	7.54	7.37	7.34
6/30/2020		7.33			
8/6/2020		7.72			
10/8/2020	6.95	7.33	7.52	7.66	7.49
12/11/2020		7.42	7.62		
4/14/2021	6.66			7.46	7.34
6/11/2021		7.71 (R)	7.73 (R)		
10/14/2021	7.01	7.64	7.7	7.45	7.42
12/21/2021		7.45			
4/12/2022		7.64	7.74	8	
4/13/2022	6.6				7.34
10/26/2022		7.23	7.61		
10/27/2022	6.8			7.5	7.31
4/26/2023		7.61	7.27	7.48	
4/27/2023	6.65				7.01
6/29/2023		7.72			
8/31/2023			7.75		
10/9/2023		7.43	7.7	7.46	
10/11/2023	7.06				7.51
11/9/2023		7.25			

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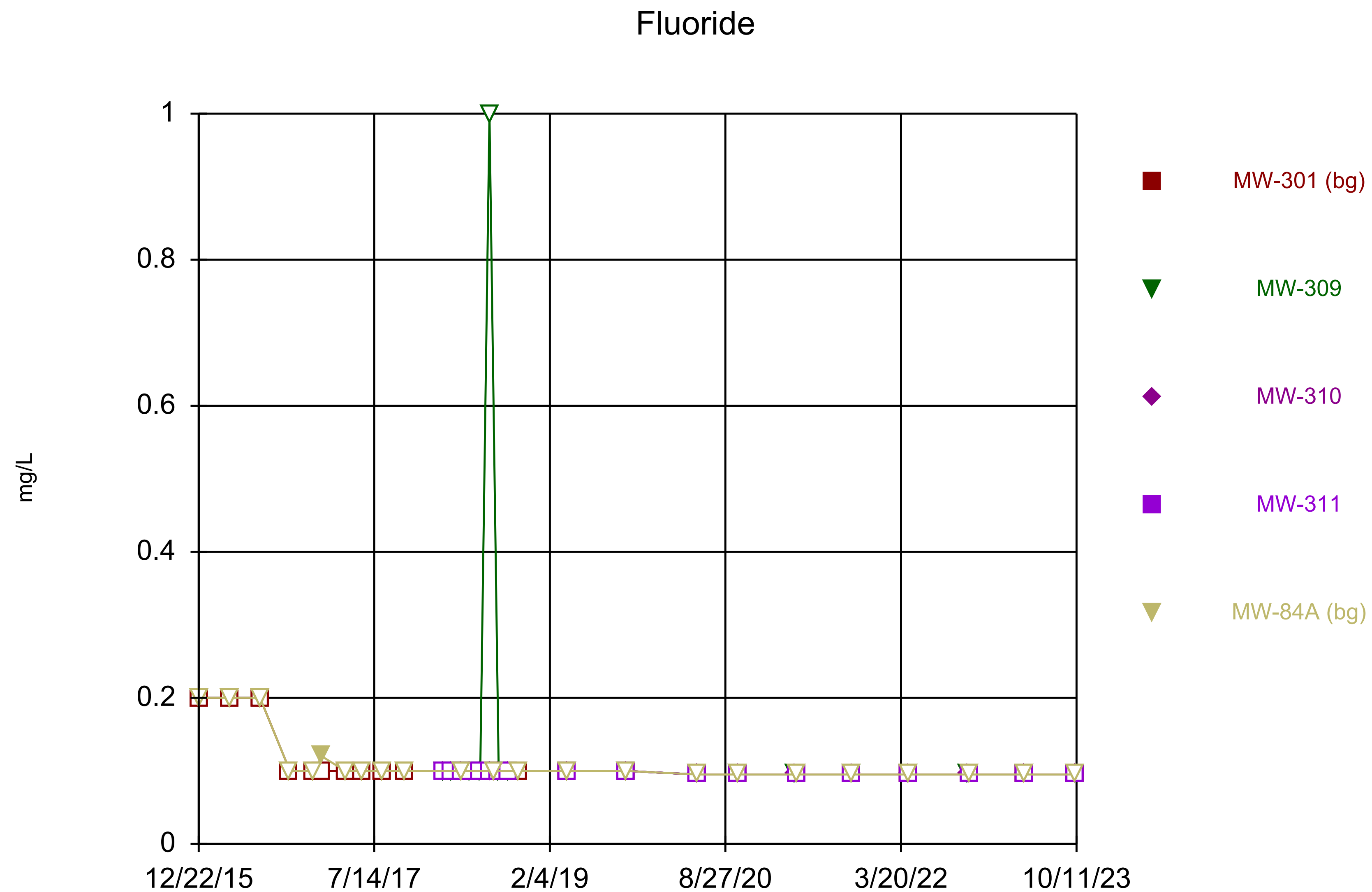
Hollow symbols indicate censored values.



Time Series Analysis Run 3/15/2024 1:50 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Fluoride (mg/L)   Analysis Run 3/15/2024 1:51 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	<0.2 (U)				<0.2 (U)
4/5/2016	<0.2 (U)				<0.2 (U)
7/8/2016	<0.2 (U)				<0.2 (U)
10/13/2016	<0.1 (U)				<0.1 (U)
12/29/2016	<0.1 (U)				<0.1 (U)
1/25/2017	<0.1 (U)				0.12 (J)
4/11/2017	<0.1 (U)				<0.1 (U)
6/6/2017	<0.1 (U)				<0.1 (U)
8/8/2017	<0.1 (U)				<0.1 (U)
10/23/2017	<0.1 (U)				
10/24/2017					<0.1 (U)
2/21/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
3/23/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/23/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/25/2018	<0.1 (U)				<0.1 (U)
5/24/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
6/23/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
7/23/2018		<1 (U)	<0.1 (U)	<0.1 (U)	
8/8/2018	<0.1 (U)				<0.1 (U)
8/22/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
9/21/2018		<0.1 (U)	<0.1 (U)	<0.1 (U)	
10/24/2018	<0.1 (U)				<0.1 (U)
4/2/2019	<0.1 (U)	<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/3/2019					<0.1 (U)
10/8/2019		<0.1 (U)	<0.1 (U)	<0.1 (U)	
10/9/2019	<0.1 (U)				<0.1 (U)
5/29/2020	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)
10/8/2020	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)
4/13/2021		<0.095 (U)	<0.095 (U)		
4/14/2021	<0.095 (U)			<0.095 (U)	<0.095 (U)
10/14/2021	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)	<0.095 (U)
4/12/2022		<0.095 (U)	<0.095 (U)	<0.095 (U)	
4/13/2022	<0.095 (U)				<0.095 (U)
10/26/2022		<0.095 (U)	<0.095 (U)		
10/27/2022	<0.095 (U)			<0.095 (U)	<0.095 (U)
4/26/2023		<0.095 (U)	<0.095 (U)	<0.095 (U)	
4/27/2023	<0.095 (U)				<0.095 (U)
10/9/2023		<0.095 (U)	<0.095 (U)	<0.095 (U)	
10/11/2023	<0.095 (U)				<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

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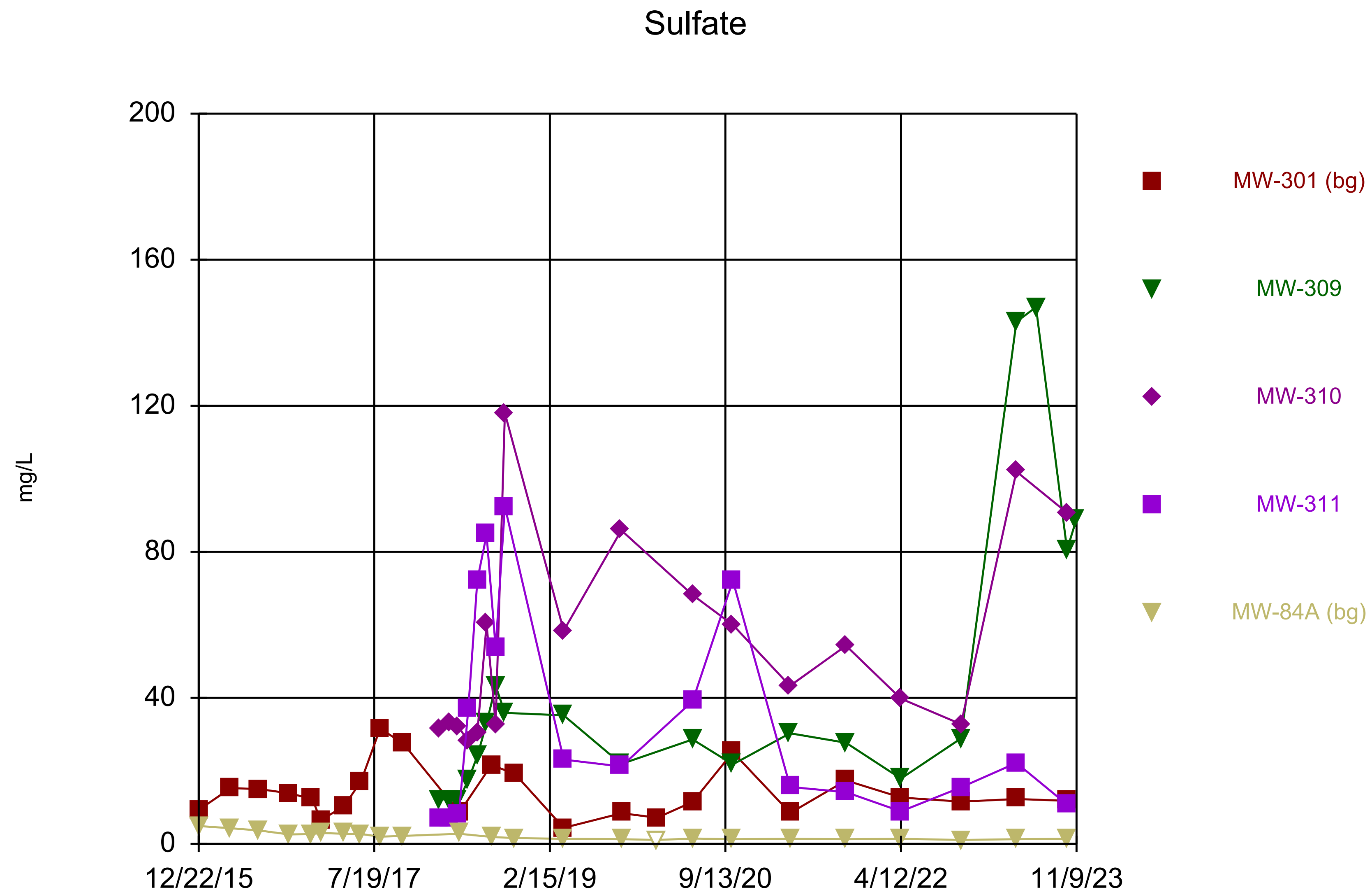
Hollow symbols indicate censored values.



Time Series Analysis Run 3/15/2024 1:50 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 3/15/2024 1:51 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	9.3				4.9
4/5/2016	15.3				4.3
7/8/2016	15				3.7 (J)
10/13/2016	13.9				2.6 (J)
12/29/2016	12.3 (J)				2.7 (J)
1/25/2017	6.5				3
4/11/2017	10.3				2.8 (J)
6/6/2017	17.1				2.7 (J)
8/8/2017	31.6				2 (J)
10/23/2017	27.5				
10/24/2017					2.2 (J)
2/21/2018		12.2	31.6	7.1	
3/23/2018		12.2	33.1	7.2	
4/23/2018		12	32	7.9	
4/25/2018	8.6				2.8 (J)
5/24/2018		17.5	28	36.9	
6/23/2018		24.1	30.4	72.3	
7/23/2018		33.1	60.2	84.7	
8/8/2018	21.6				1.9 (J)
8/22/2018		43.3	32.8	53.6	
9/21/2018		35.9	118	92.4	
10/24/2018	19.2				1.6 (J)
4/2/2019	4.4	35.2	58.4	23.1	
4/3/2019					1.4 (J)
10/8/2019		21.9	85.9	21.2	
10/9/2019	8.4				1.3 (J)
2/3/2020	7.2				<2.2 (U)
5/29/2020	11.5	28.6	68.2	39.1	1.5 (J)
10/8/2020	25.1	21.8	60	72.1	1.3 (J)
4/13/2021		30.3	43.3		
4/14/2021	8.5			15.6	1.4 (J)
10/14/2021	17.4	27.7	54.3	14.2	1.3 (J)
4/12/2022		17.9	39.8	8.9	
4/13/2022	12.7				1.4 (J)
10/26/2022		28.9	32.8		
10/27/2022	11.6			15.5	1.1 (J)
4/26/2023		143	102	22.2	
4/27/2023	12.3				1.3 (J)
6/29/2023		147			
10/9/2023		80.6	90.7	10.8	
10/11/2023	11.8				1.4 (J)
11/9/2023		89			

ND substitution: RL or RL/2 if <15% NDs.

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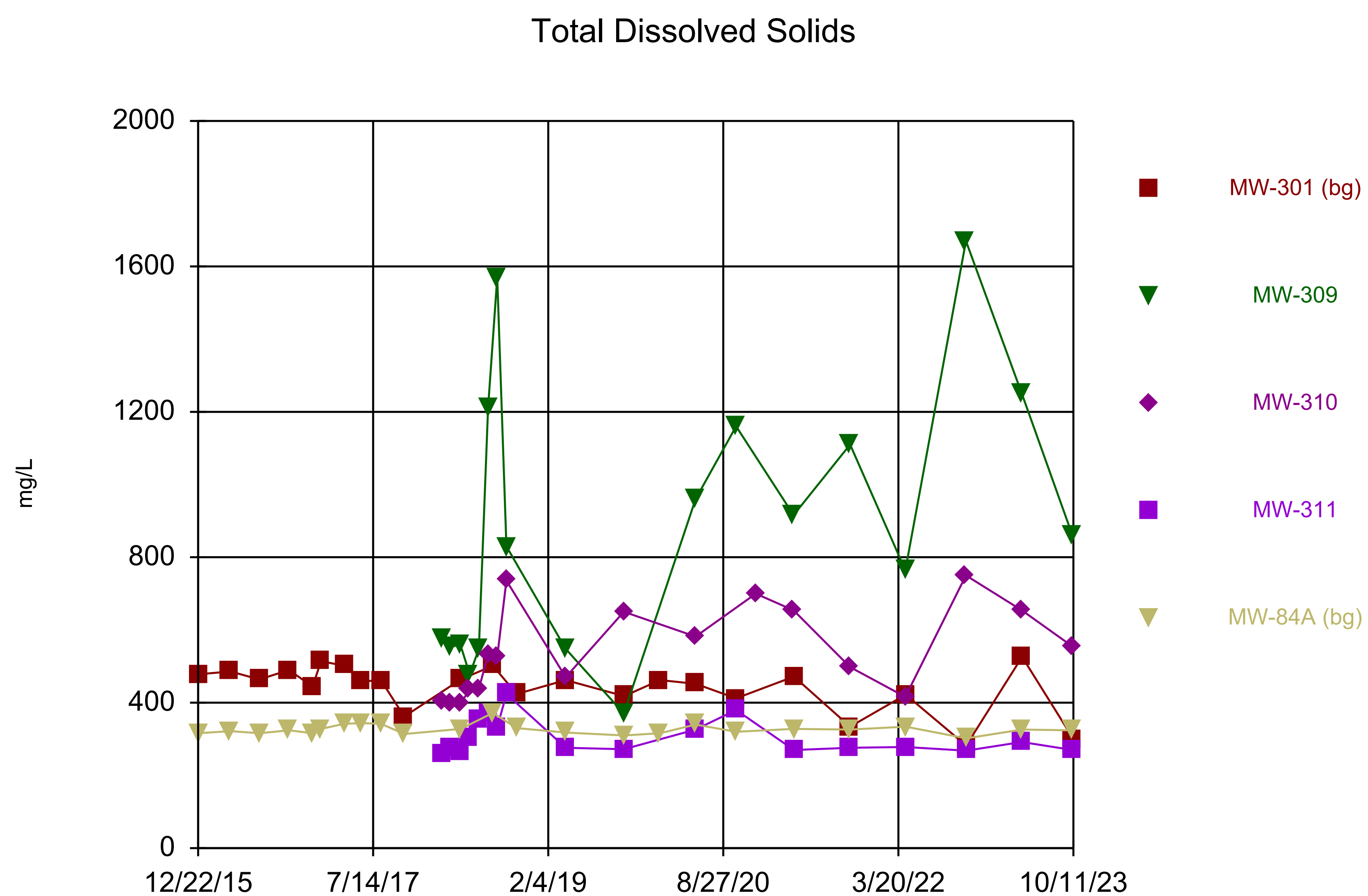


Time Series Analysis Run 3/15/2024 1:51 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Total Dissolved Solids (mg/L)   Analysis Run 3/15/2024 1:51 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	478				316
4/5/2016	486				322
7/8/2016	464				316
10/13/2016	490				324
12/29/2016	444				316
1/25/2017	514				328
4/11/2017	502				342
6/6/2017	458				344
8/8/2017	462				342
10/23/2017	362				
10/24/2017					314
2/21/2018		576	406	260	
3/23/2018		552	398	274	
4/23/2018		562	396	262	
4/25/2018	464				328
5/24/2018		478	436	304	
6/23/2018		548	438	352	
7/23/2018		1210	532	372	
8/8/2018	502				372
8/22/2018		1570	526	332	
9/21/2018		830	736	424	
10/24/2018	424				330
4/2/2019	462	548	470	276	
4/3/2019					318
10/8/2019		370	650	272	
10/9/2019	418				310
2/3/2020	462				316
5/29/2020	452	960	582	326	340
10/8/2020	412	1160		380	320
12/11/2020			700 (R)		
4/13/2021		916	654		
4/14/2021	472			270	328
10/14/2021	334	1110	498	276	326
4/12/2022		764	416	278	
4/13/2022	422				334
10/26/2022		1670	750		
10/27/2022	282			268	302
4/26/2023		1250	654	292	
4/27/2023	526				326
10/9/2023		858	554	270	
10/11/2023	300				324

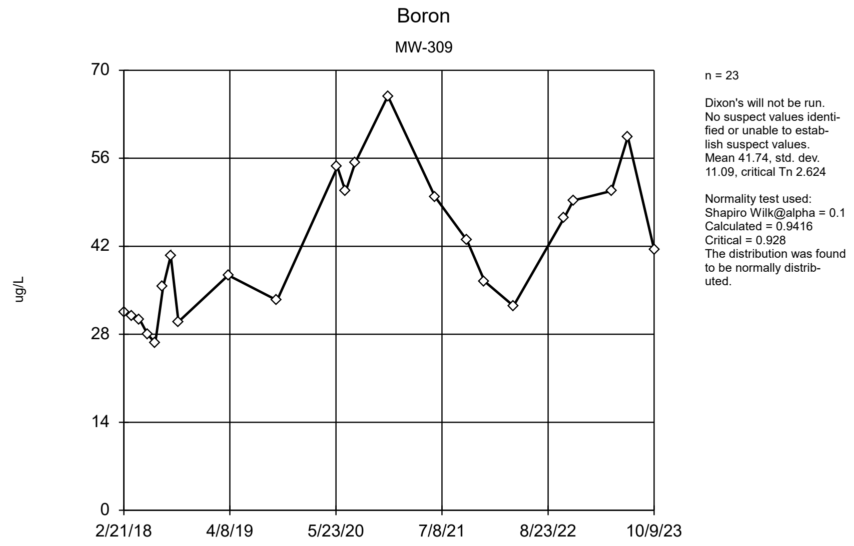
Attachment 2

Outlier Analysis

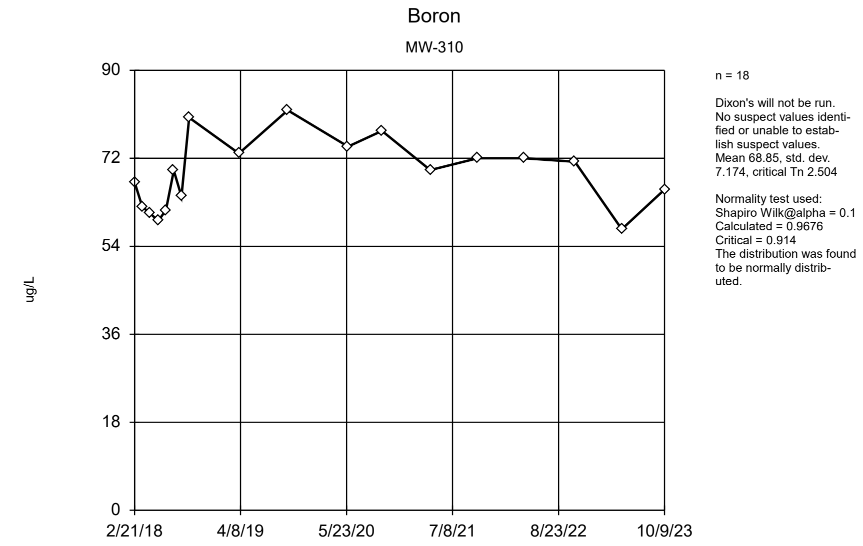
Outlier Analysis

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020 Printed 3/15/2024, 2:08 PM

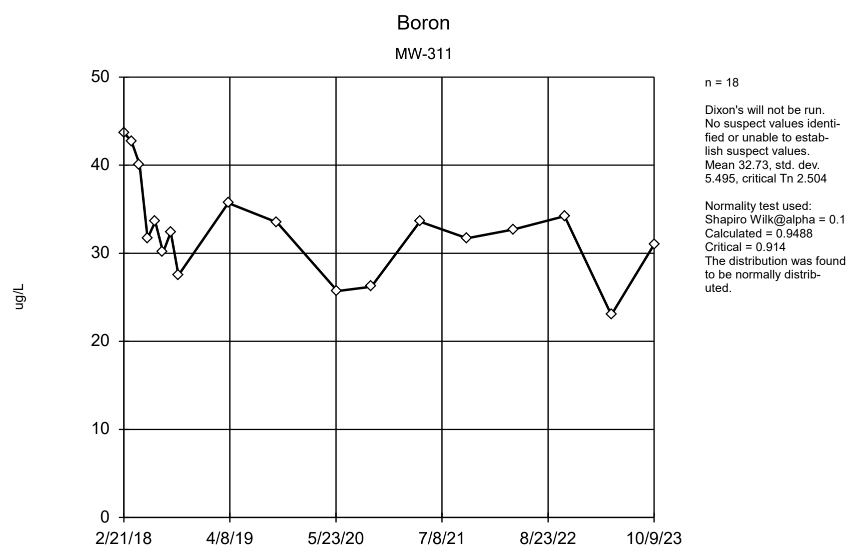
Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (ug/L)	MW-309	No	n/a	n/a	EPA 1989	0.05	23	41.74	11.09	normal	ShapiroWilk
Boron (ug/L)	MW-310	No	n/a	n/a	EPA 1989	0.05	18	68.85	7.174	normal	ShapiroWilk
Boron (ug/L)	MW-311	No	n/a	n/a	EPA 1989	0.05	18	32.73	5.495	normal	ShapiroWilk
Calcium (ug/L)	MW-309	No	n/a	n/a	NP (nrm)	NaN	19	68895	34924	unknown	ShapiroWilk
Calcium (ug/L)	MW-310	No	n/a	n/a	NP (nrm)	NaN	20	43270	11055	unknown	ShapiroWilk
Calcium (ug/L)	MW-311	No	n/a	n/a	EPA 1989	0.05	18	64089	6493	normal	ShapiroWilk
Chloride (mg/L)	MW-309	No	n/a	n/a	EPA 1989	0.05	18	348.3	225.2	ln(x)	ShapiroWilk
Chloride (mg/L)	MW-310	No	n/a	n/a	EPA 1989	0.05	19	121	83.79	normal	ShapiroWilk
Chloride (mg/L)	MW-311	No	n/a	n/a	EPA 1989	0.05	18	2.1	0.8345	normal	ShapiroWilk
Field pH (Std. Units)	MW-309	No	n/a	n/a	EPA 1989	0.05	25	7.57	0.2021	normal	ShapiroWilk
Field pH (Std. Units)	**MW-310**	**Yes**	**9.79**	**4/2/2019**	**Dixon`s**	**0.05**	**23**	**7.817**	**0.4578**	**normal**	**ShapiroWilk**
Field pH (Std. Units)	MW-311	No	n/a	n/a	NP (nrm)	NaN	19	7.615	0.1791	unknown	ShapiroWilk
Fluoride (mg/L)	MW-309	n/a	n/a	n/a	NP (nrm)	NaN	18	0.1478	0.2127	unknown	ShapiroWilk
Fluoride (mg/L)	MW-310	n/a	n/a	n/a	NP (nrm)	NaN	18	0.09778	0.002557	unknown	ShapiroWilk
Fluoride (mg/L)	MW-311	n/a	n/a	n/a	NP (nrm)	NaN	18	0.09778	0.002557	unknown	ShapiroWilk
Sulfate (mg/L)	**MW-309**	**Yes**	**143,147**	**4/26/2023...**	**NP (nrm)**	**NaN**	**20**	**43.11**	**40.23**	**unknown**	**ShapiroWilk**
Sulfate (mg/L)	MW-310	No	n/a	n/a	NP (nrm)	NaN	18	55.64	27.53	unknown	ShapiroWilk
Sulfate (mg/L)	MW-311	No	n/a	n/a	EPA 1989	0.05	18	33.6	28.8	ln(x)	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-309	No	n/a	n/a	EPA 1989	0.05	18	885.1	379.2	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-310	No	n/a	n/a	EPA 1989	0.05	18	544.2	121.3	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-311	No	n/a	n/a	NP (nrm)	NaN	18	304.9	48.49	unknown	ShapiroWilk



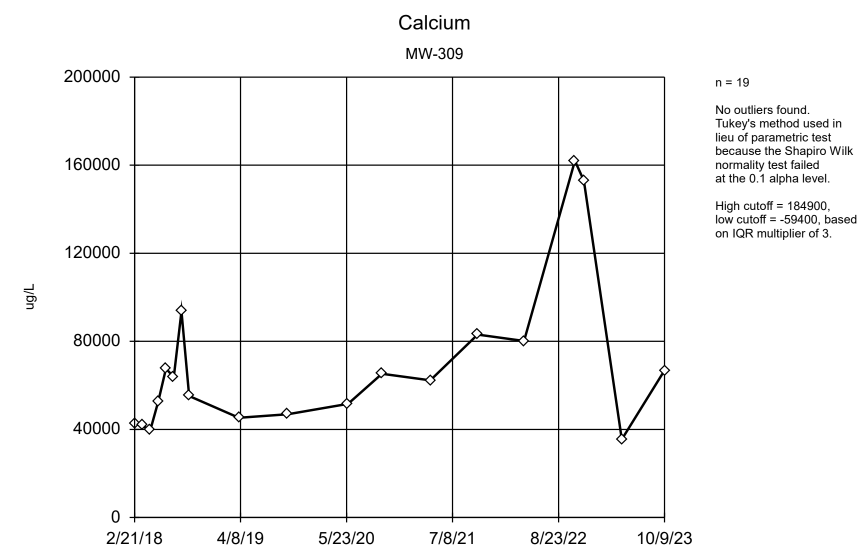
EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020



EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020



EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020



Tukey's Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Boron (ug/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	31.4
3/23/2018	31
4/23/2018	30.4
5/24/2018	28
6/23/2018	26.6
7/23/2018	35.5
8/22/2018	40.5
9/21/2018	30
4/2/2019	37.4
10/8/2019	33.4
5/29/2020	54.6
6/30/2020	50.7
8/6/2020	55.3
12/11/2020	65.9 (R)
6/11/2021	49.9 (R)
10/14/2021	42.9
12/21/2021	36.4
4/12/2022	32.5
10/26/2022	46.6
11/30/2022	49.3
4/26/2023	50.8
6/29/2023	59.4
10/9/2023	41.5

EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	67.1
3/23/2018	62.1
4/23/2018	60.7
5/24/2018	59.2
6/23/2018	61.4
7/23/2018	69.5
8/22/2018	64.2
9/21/2018	80.3
4/2/2019	73
10/8/2019	81.8
5/29/2020	74.4
10/8/2020	77.6
4/13/2021	69.6
10/14/2021	72
4/12/2022	72
10/26/2022	71.3
4/26/2023	57.5
10/9/2023	65.6

EPA 1989 Outlier Screening

Constituent: Boron (ug/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	43.7
3/23/2018	42.7
4/23/2018	40.1
5/24/2018	31.7
6/23/2018	33.6
7/23/2018	30.1
8/22/2018	32.4
9/21/2018	27.5
4/2/2019	35.7
10/8/2019	33.5
5/29/2020	25.7
10/8/2020	26.2
4/14/2021	33.6
10/14/2021	31.7
4/12/2022	32.7
10/27/2022	34.2
4/26/2023	23
10/9/2023	31

Tukey's Outlier Screening

Constituent: Calcium (ug/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	42700
3/23/2018	41800
4/23/2018	39600
5/24/2018	52700
6/23/2018	67600
7/23/2018	63800
8/22/2018	93600
9/21/2018	55200
4/2/2019	45300
10/8/2019	46900
5/29/2020	51600
10/8/2020	65300
4/13/2021	62300
10/14/2021	83100
4/12/2022	80200
10/26/2022	162000
11/30/2022	153000
4/26/2023	35500
10/9/2023	66800

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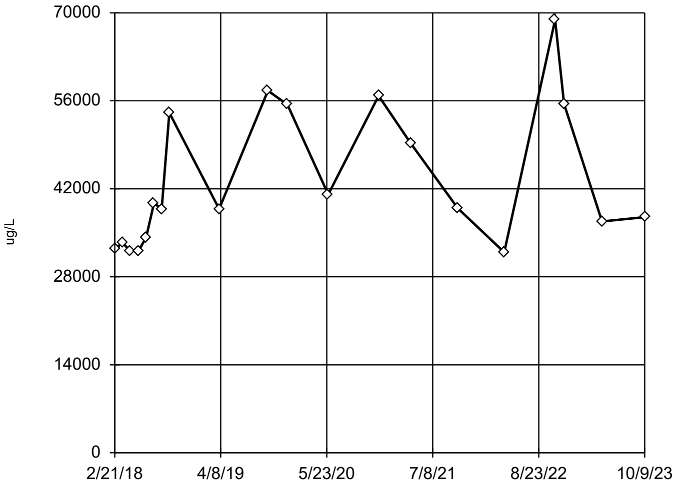
Calcium

MW-310



n = 20

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 117450, low cutoff = -28850, based on IQR multiplier of 3.

Tukey's Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

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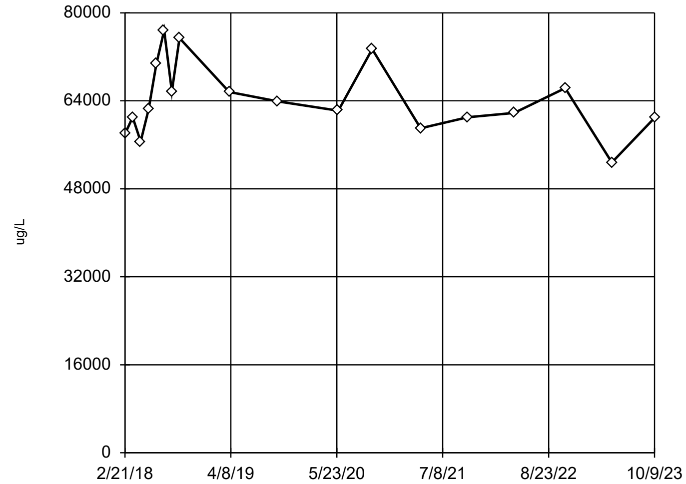
Calcium

MW-311



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 64089, std. dev. 6493, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9474
Critical = 0.914
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

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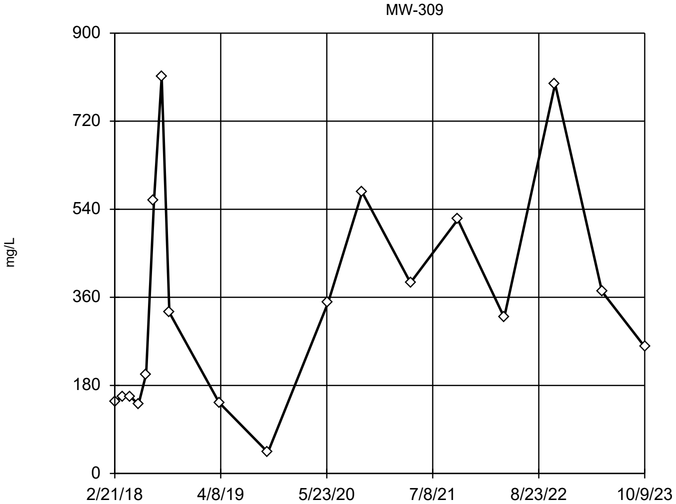
Chloride

MW-309



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 348.3, std. dev. 225.2, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9395
Critical = 0.914 (after natural log transformation)
The distribution was found to be log-normal.

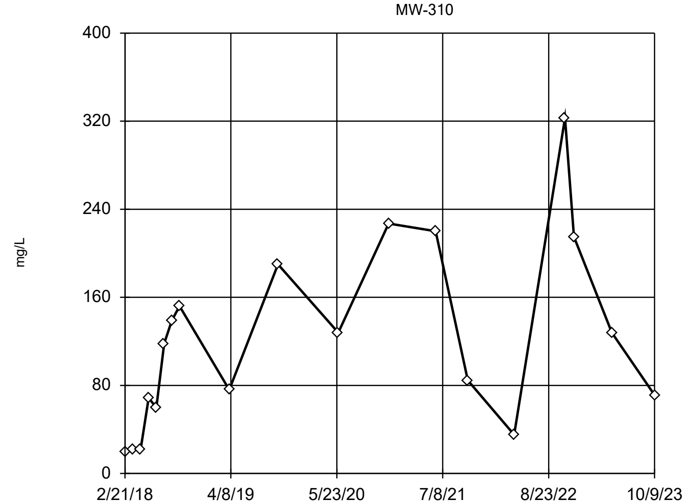
EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG

Chloride

MW-310



n = 19

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 121, std. dev. 83.79, critical Tn 2.532

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9287
Critical = 0.917
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:05 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Calcium (ug/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	32400
3/23/2018	33400
4/23/2018	32100
5/24/2018	32100
6/23/2018	34300
7/23/2018	39700
8/22/2018	38800
9/21/2018	54100
4/2/2019	38800
10/8/2019	57600
12/23/2019	55400
5/29/2020	41100
12/11/2020	56800 (R)
4/13/2021	49300
10/14/2021	38900
4/12/2022	31900
10/26/2022	68900
11/30/2022	55500
4/26/2023	36800
10/9/2023	37500

EPA 1989 Outlier Screening

Constituent: Calcium (ug/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	58000
3/23/2018	61000
4/23/2018	56600
5/24/2018	62500
6/23/2018	70700
7/23/2018	76800
8/22/2018	65700
9/21/2018	75400
4/2/2019	65600
10/8/2019	63900
5/29/2020	62200
10/8/2020	73400
4/14/2021	59000
10/14/2021	61000
4/12/2022	61800
10/27/2022	66300
4/26/2023	52800
10/9/2023	60900

EPA 1989 Outlier Screening

Constituent: Chloride (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

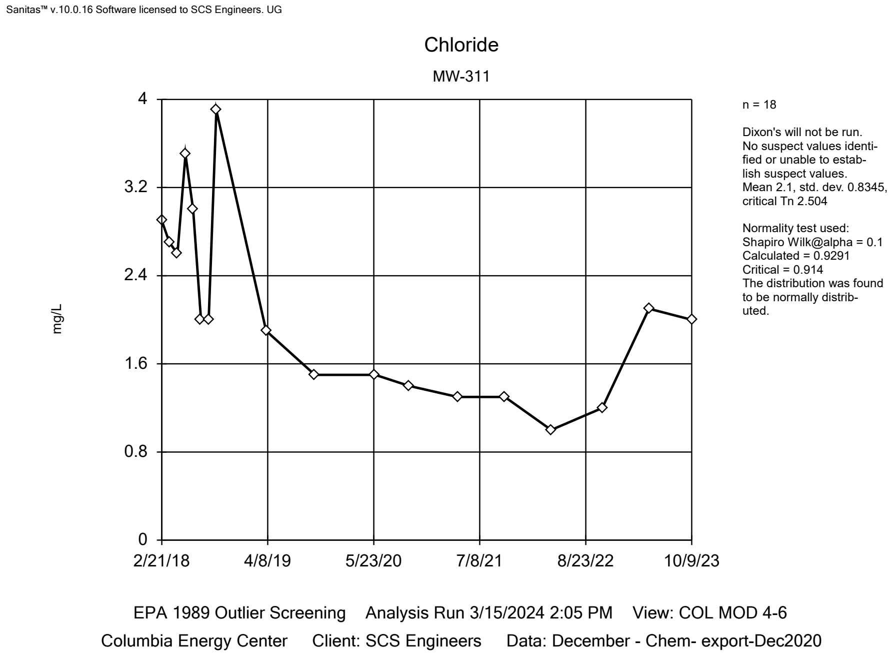
	MW-309
2/21/2018	147
3/23/2018	157
4/23/2018	157
5/24/2018	141
6/23/2018	203
7/23/2018	557
8/22/2018	811
9/21/2018	329
4/2/2019	145
10/8/2019	43.2
5/29/2020	350
10/8/2020	575
4/13/2021	390
10/14/2021	519
4/12/2022	319
10/26/2022	796
4/26/2023	372
10/9/2023	259

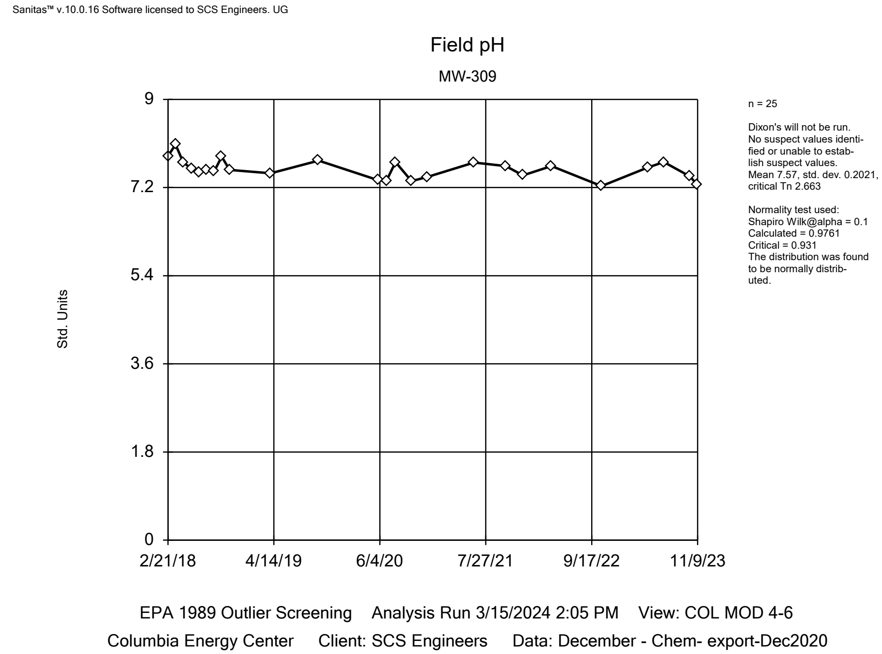
EPA 1989 Outlier Screening

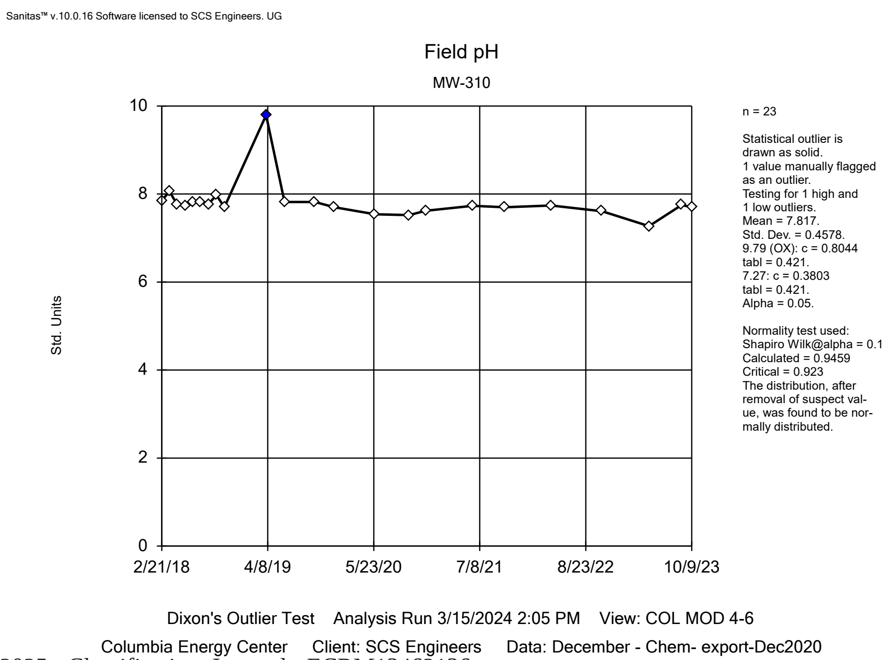
Constituent: Chloride (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

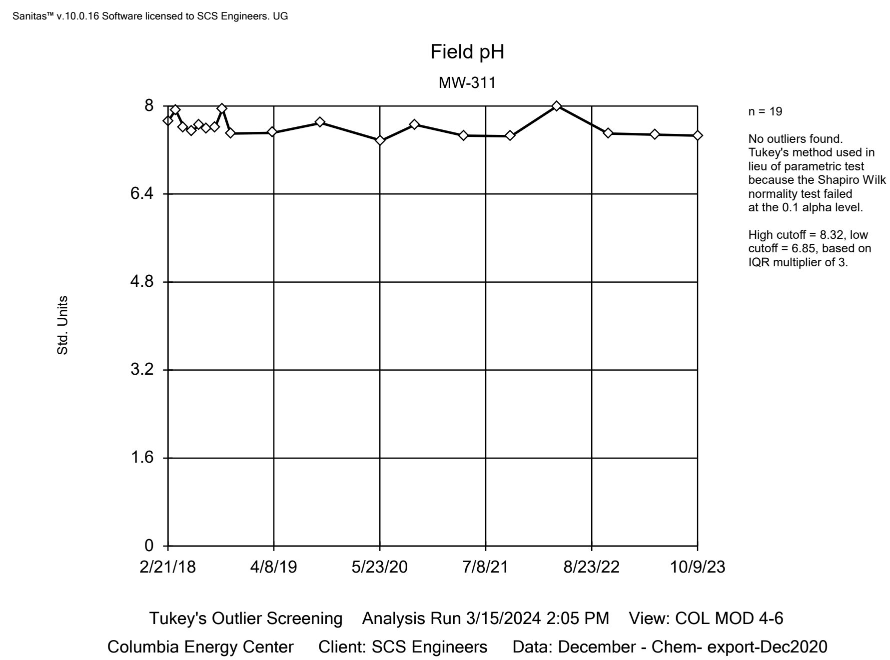
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	19.8
3/23/2018	21.7
4/23/2018	22.1
5/24/2018	68.6
6/23/2018	59.8
7/23/2018	118
8/22/2018	139
9/21/2018	152
4/2/2019	76
10/8/2019	190
5/29/2020	128
12/11/2020	227 (R)
6/11/2021	220 (R)
10/14/2021	84.6
4/12/2022	35.2
10/26/2022	323
11/30/2022	215
4/26/2023	128
10/9/2023	71.3


Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG
Chloride
MW-311
mg/L
4
3.2
2.4
1.6
0.8
0
2/21/18
4/8/19
5/23/20
7/8/21
8/23/22
10/9/23
n = 18
Dixon's will not be run.
No suspect values identi-
fied or unable to estab-
lish suspect values.
Mean 2.1, std. dev. 0.8345,
critical Tn 2.504
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9291
Critical = 0.914
The distribution was found
to be normally distrib-
uted.
EPA 1989 Outlier Screening Analysis Run 3/15/2024 2:05 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020


Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG
Field pH
MW-309
Std. Units
9
7.2
5.4
3.6
1.8
0
2/21/18
4/14/19
6/4/20
7/27/21
9/17/22
11/9/23
n = 25
Dixon's will not be run.
No suspect values identi-
fied or unable to estab-
lish suspect values.
Mean 7.57, std. dev. 0.2021,
critical Tn 2.663
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9761
Critical = 0.931
The distribution was found
to be normally distrib-
uted.
EPA 1989 Outlier Screening Analysis Run 3/15/2024 2:05 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020


Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG
Field pH
MW-310
Std. Units
10
8
6
4
2
0
2/21/18
4/8/19
5/23/20
7/8/21
8/23/22
10/9/23
n = 23
Statistical outlier is
drawn as solid.
1 value manually flagged
as an outlier.
Testing for 1 high and
1 low outliers.
Mean = 7.817.
Std. Dev. = 0.4578.
9.79 (OX): c = 0.8044
tabl = 0.421.
7.27: c = 0.3803
tabl = 0.421.
Alpha = 0.05.
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9459
Critical = 0.923
The distribution, after
removal of suspect val-
ue, was found to be nor-
mally distributed.
Dixon's Outlier Test Analysis Run 3/15/2024 2:05 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020


Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG
Field pH
MW-311
Std. Units
8
6.4
4.8
3.2
1.6
0
2/21/18
4/8/19
5/23/20
7/8/21
8/23/22
10/9/23
n = 19
No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.
High cutoff = 8.32, low
cutoff = 6.85, based on
IQR multiplier of 3.
Tukey's Outlier Screening Analysis Run 3/15/2024 2:05 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	2.9
3/23/2018	2.7
4/23/2018	2.6
5/24/2018	3.5
6/23/2018	3
7/23/2018	2 (J)
8/22/2018	2 (J)
9/21/2018	3.9
4/2/2019	1.9 (J)
10/8/2019	1.5 (J)
5/29/2020	1.5 (J)
10/8/2020	1.4 (J)
4/14/2021	1.3 (J)
10/14/2021	1.3 (J)
4/12/2022	1 (J)
10/27/2022	1.2 (J)
4/26/2023	2.1
10/9/2023	2 (J)

EPA 1989 Outlier Screening

Constituent: Field pH (Std. Units)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	7.84
3/23/2018	8.08
4/23/2018	7.71
5/24/2018	7.59
6/23/2018	7.5
7/23/2018	7.55
8/22/2018	7.53
9/21/2018	7.83
10/22/2018	7.56
4/2/2019	7.49
10/8/2019	7.75
5/29/2020	7.35
6/30/2020	7.33
8/6/2020	7.72
10/8/2020	7.33
12/11/2020	7.42
6/11/2021	7.71 (R)
10/14/2021	7.64
12/21/2021	7.45
4/12/2022	7.64
10/26/2022	7.23
4/26/2023	7.61
6/29/2023	7.72
10/9/2023	7.43
11/9/2023	7.25

Dixon's Outlier Test

Constituent: Field pH (Std. Units) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	7.85
3/23/2018	8.06
4/23/2018	7.75
5/24/2018	7.74
6/23/2018	7.82
7/23/2018	7.81
8/22/2018	7.77
9/21/2018	7.98
10/22/2018	7.7
4/2/2019	9.79 (OX)
6/12/2019	7.82
10/8/2019	7.82
12/23/2019	7.7
5/29/2020	7.54
10/8/2020	7.52
12/11/2020	7.62
6/11/2021	7.73 (R)
10/14/2021	7.7
4/12/2022	7.74
10/26/2022	7.61
4/26/2023	7.27
8/31/2023	7.75
10/9/2023	7.7

Tukey's Outlier Screening

Constituent: Field pH (Std. Units)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	7.72
3/23/2018	7.93
4/23/2018	7.62
5/24/2018	7.54
6/23/2018	7.65
7/23/2018	7.59
8/22/2018	7.6
9/21/2018	7.95
10/22/2018	7.5
4/2/2019	7.51
10/8/2019	7.69
5/29/2020	7.37
10/8/2020	7.66
4/14/2021	7.46
10/14/2021	7.45
4/12/2022	8
10/27/2022	7.5
4/26/2023	7.48
10/9/2023	7.46

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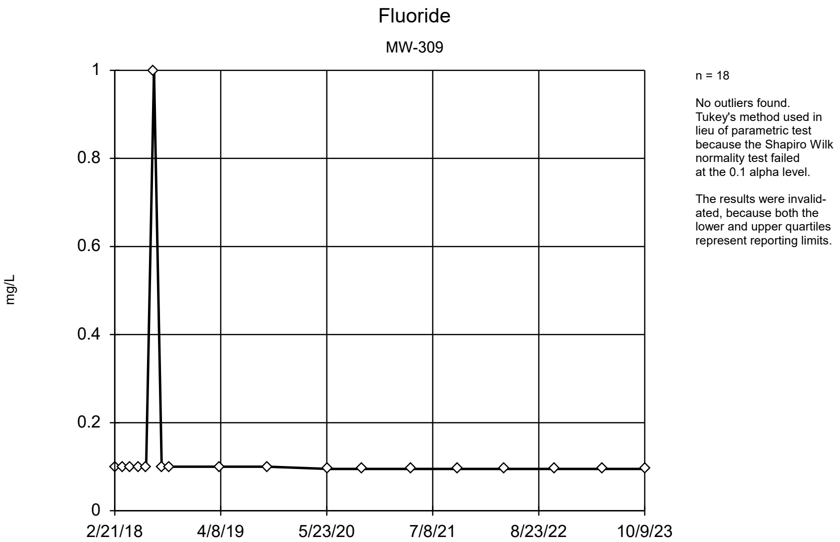
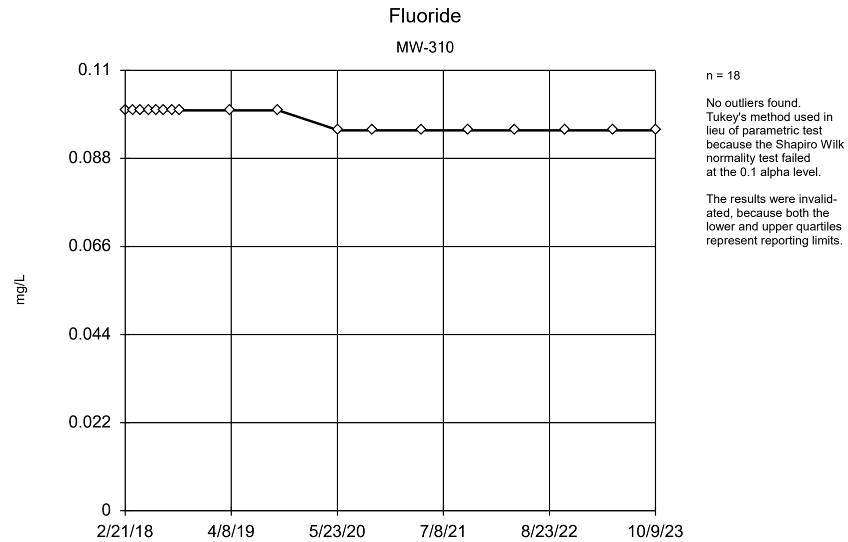


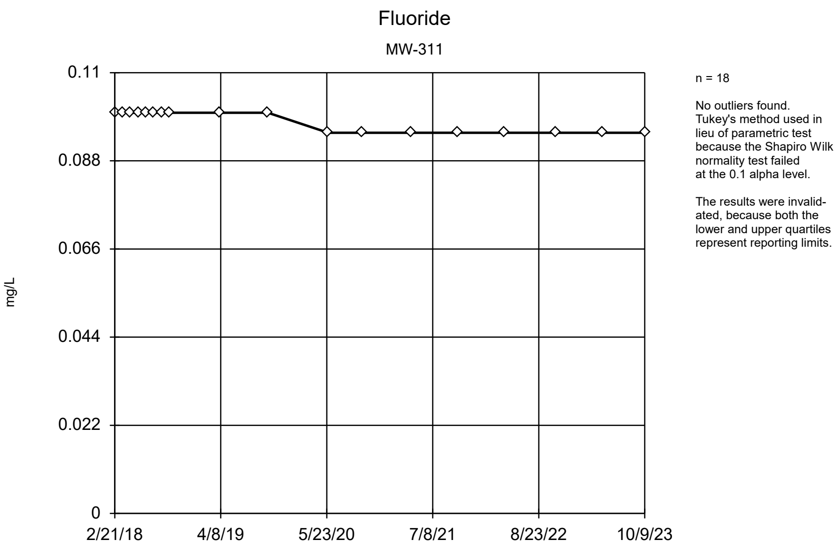
Tukey's Outlier Screening Analysis Run 3/15/2024 2:06 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG



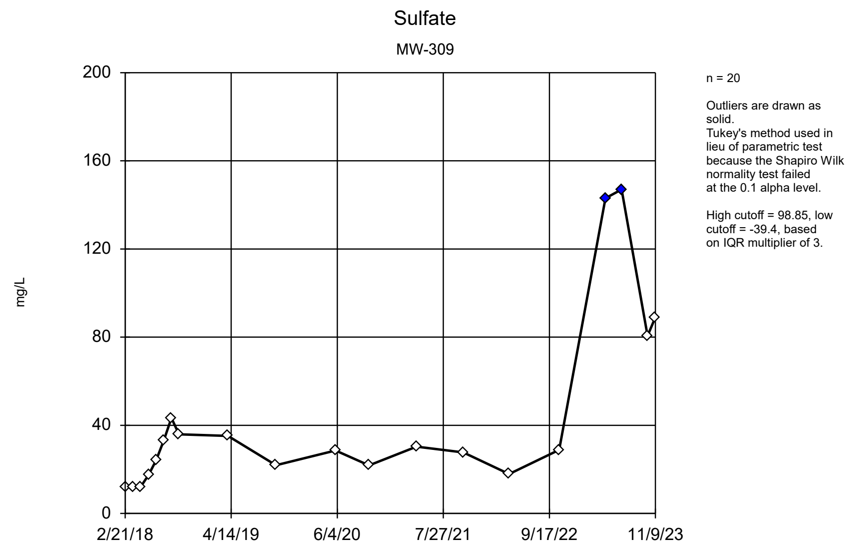
Tukey's Outlier Screening Analysis Run 3/15/2024 2:06 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG



Tukey's Outlier Screening Analysis Run 3/15/2024 2:06 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Sanitas™ v.10.0.16 Software licensed to SCS Engineers. UG



Tukey's Outlier Screening Analysis Run 3/15/2024 2:06 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Fluoride (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	<0.1 (U)
3/23/2018	<0.1 (U)
4/23/2018	<0.1 (U)
5/24/2018	<0.1 (U)
6/23/2018	<0.1 (U)
7/23/2018	<1 (U)
8/22/2018	<0.1 (U)
9/21/2018	<0.1 (U)
4/2/2019	<0.1 (U)
10/8/2019	<0.1 (U)
5/29/2020	<0.095 (U)
10/8/2020	<0.095 (U)
4/13/2021	<0.095 (U)
10/14/2021	<0.095 (U)
4/12/2022	<0.095 (U)
10/26/2022	<0.095 (U)
4/26/2023	<0.095 (U)
10/9/2023	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Fluoride (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	<0.1 (U)
3/23/2018	<0.1 (U)
4/23/2018	<0.1 (U)
5/24/2018	<0.1 (U)
6/23/2018	<0.1 (U)
7/23/2018	<0.1 (U)
8/22/2018	<0.1 (U)
9/21/2018	<0.1 (U)
4/2/2019	<0.1 (U)
10/8/2019	<0.1 (U)
5/29/2020	<0.095 (U)
10/8/2020	<0.095 (U)
4/13/2021	<0.095 (U)
10/14/2021	<0.095 (U)
4/12/2022	<0.095 (U)
10/26/2022	<0.095 (U)
4/26/2023	<0.095 (U)
10/9/2023	<0.095 (U)

ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Fluoride (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	<0.1 (U)
3/23/2018	<0.1 (U)
4/23/2018	<0.1 (U)
5/24/2018	<0.1 (U)
6/23/2018	<0.1 (U)
7/23/2018	<0.1 (U)
8/22/2018	<0.1 (U)
9/21/2018	<0.1 (U)
4/2/2019	<0.1 (U)
10/8/2019	<0.1 (U)
5/29/2020	<0.095 (U)
10/8/2020	<0.095 (U)
4/14/2021	<0.095 (U)
10/14/2021	<0.095 (U)
4/12/2022	<0.095 (U)
10/27/2022	<0.095 (U)
4/26/2023	<0.095 (U)
10/9/2023	<0.095 (U)

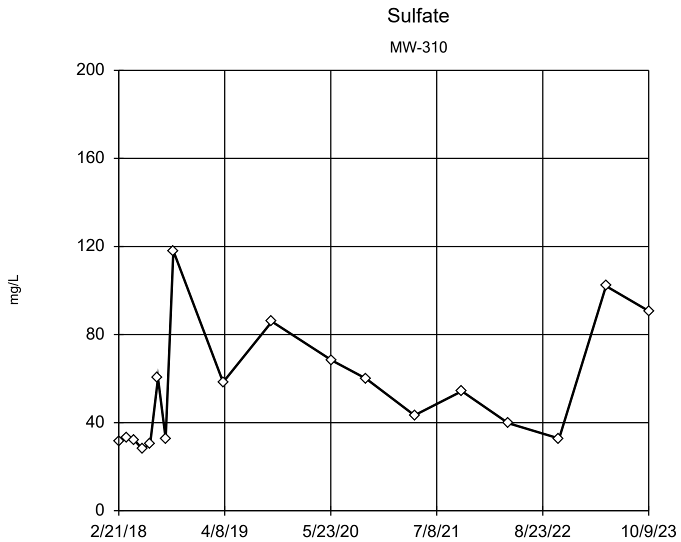
ND substitution: RL or RL/2 if <15% NDs.

Tukey's Outlier Screening

Constituent: Sulfate (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	12.2
3/23/2018	12.2
4/23/2018	12
5/24/2018	17.5
6/23/2018	24.1
7/23/2018	33.1
8/22/2018	43.3
9/21/2018	35.9
4/2/2019	35.2
10/8/2019	21.9
5/29/2020	28.6
10/8/2020	21.8
4/13/2021	30.3
10/14/2021	27.7
4/12/2022	17.9
10/26/2022	28.9
4/26/2023	143 (O)
6/29/2023	147 (O)
10/9/2023	80.6
11/9/2023	89

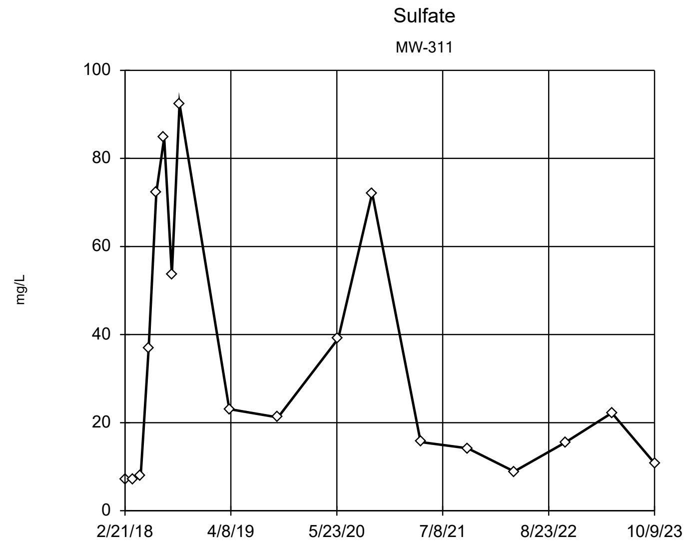


n = 18

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

High cutoff = 211, low cutoff = -101.6, based on IQR multiplier of 3.

Tukey's Outlier Screening   Analysis Run 3/15/2024 2:06 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

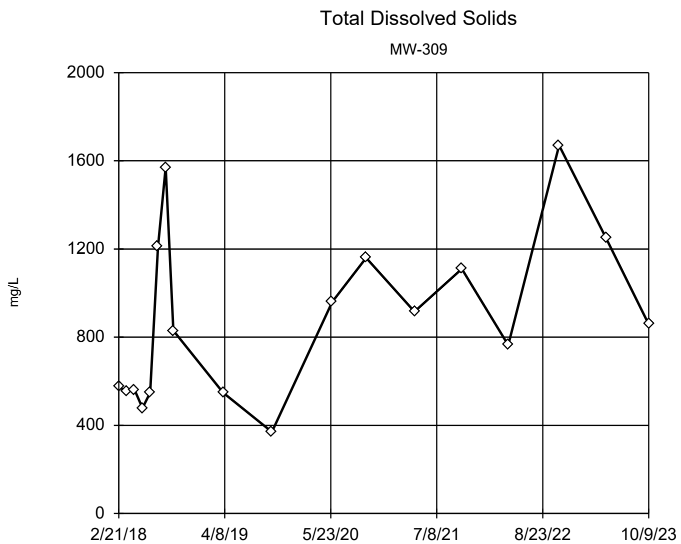


n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 33.6, std. dev. 28.8, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9241
Critical = 0.914 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:06 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

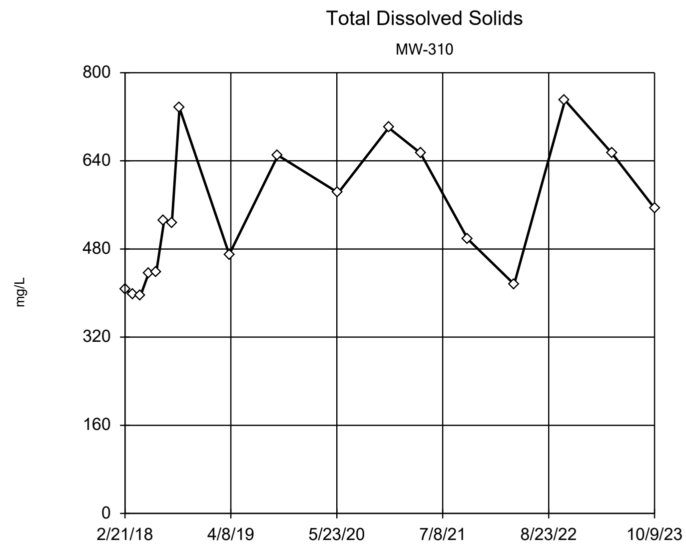


n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 885.1, std. dev. 379.2, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.928
Critical = 0.914
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:06 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020



n = 18

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 544.2, std. dev. 121.3, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9148
Critical = 0.914
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening   Analysis Run 3/15/2024 2:06 PM   View: COL MOD 4-6
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	31.6
3/23/2018	33.1
4/23/2018	32
5/24/2018	28
6/23/2018	30.4
7/23/2018	60.2
8/22/2018	32.8
9/21/2018	118
4/2/2019	58.4
10/8/2019	85.9
5/29/2020	68.2
10/8/2020	60
4/13/2021	43.3
10/14/2021	54.3
4/12/2022	39.8
10/26/2022	32.8
4/26/2023	102
10/9/2023	90.7

EPA 1989 Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	7.1
3/23/2018	7.2
4/23/2018	7.9
5/24/2018	36.9
6/23/2018	72.3
7/23/2018	84.7
8/22/2018	53.6
9/21/2018	92.4
4/2/2019	23.1
10/8/2019	21.2
5/29/2020	39.1
10/8/2020	72.1
4/14/2021	15.6
10/14/2021	14.2
4/12/2022	8.9
10/27/2022	15.5
4/26/2023	22.2
10/9/2023	10.8

EPA 1989 Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

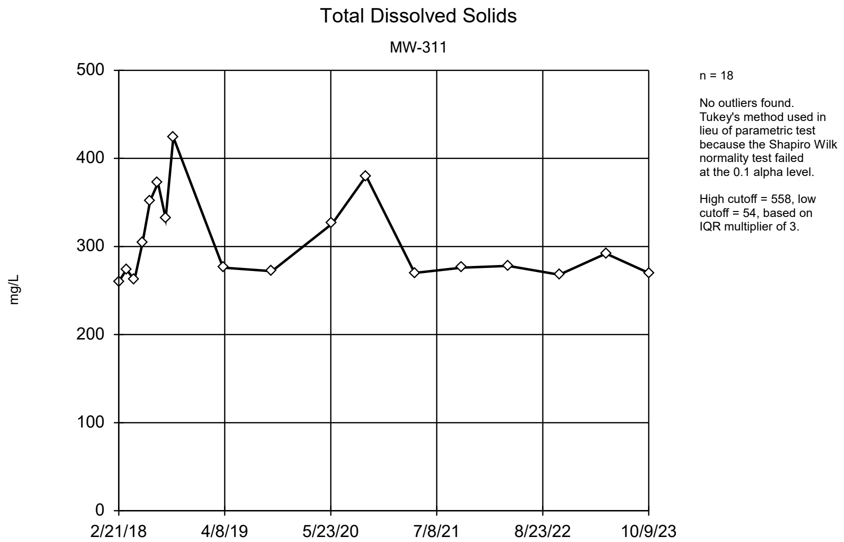
	MW-309
2/21/2018	576
3/23/2018	552
4/23/2018	562
5/24/2018	478
6/23/2018	548
7/23/2018	1210
8/22/2018	1570
9/21/2018	830
4/2/2019	548
10/8/2019	370
5/29/2020	960
10/8/2020	1160
4/13/2021	916
10/14/2021	1110
4/12/2022	764
10/26/2022	1670
4/26/2023	1250
10/9/2023	858

EPA 1989 Outlier Screening

Constituent: Total Dissolved Solids (mg/L)   Analysis Run 3/15/2024 2:08 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	406
3/23/2018	398
4/23/2018	396
5/24/2018	436
6/23/2018	438
7/23/2018	532
8/22/2018	526
9/21/2018	736
4/2/2019	470
10/8/2019	650
5/29/2020	582
12/11/2020	700 (R)
4/13/2021	654
10/14/2021	498
4/12/2022	416
10/26/2022	750
4/26/2023	654
10/9/2023	554



Tukey's Outlier Screening   Analysis Run 3/15/2024 2:06 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Tukey's Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 3/15/2024 2:08 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	260
3/23/2018	274
4/23/2018	262
5/24/2018	304
6/23/2018	352
7/23/2018	372
8/22/2018	332
9/21/2018	424
4/2/2019	276
10/8/2019	272
5/29/2020	326
10/8/2020	380
4/14/2021	270
10/14/2021	276
4/12/2022	278
10/27/2022	268
4/26/2023	292
10/9/2023	270

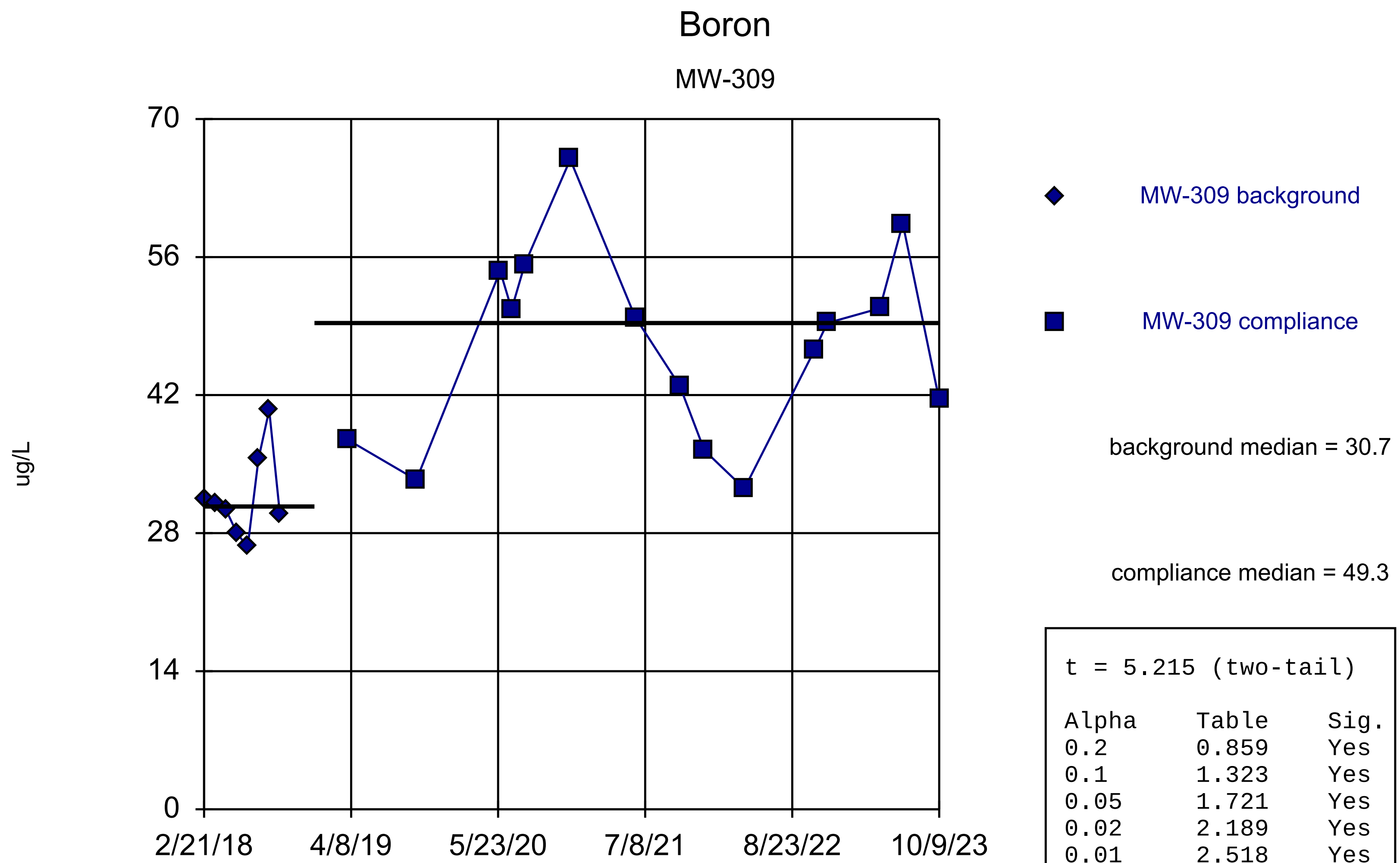
Attachment 3

Welch's/Mann-Whitney Comparison

Welch's t-test/Mann-Whitney

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020   Printed 9/4/2024, 9:03 AM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Boron (ug/L)	**MW-309**	**5.215**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Welch`s**
Boron (ug/L)	MW-310	1.851	Yes	Yes	Yes	No	0.01	No	(intrawell)	Welch`s
Boron (ug/L)	MW-311	-1.768	Yes	Yes	No	No	0.01	No	(intrawell)	Welch`s
Calcium (ug/L)	MW-309	1.43	Yes	Yes	No	No	0.01	No	(intrawell)	Welch`s
Calcium (ug/L)	MW-310 (bg)	2.085	Yes	Yes	No	No	0.01	No	(intrawell)	Mann-W (normality)
Calcium (ug/L)	MW-311	-0....	Yes	No	No	No	0.01	No	(intrawell)	Welch`s
Chloride (mg/L)	MW-309	0.5279	No	No	No	No	0.01	No	(intrawell)	Welch`s
Chloride (mg/L)	MW-310	2.426	Yes	Yes	Yes	Yes	0.01	No	(intrawell)	Welch`s
Chloride (mg/L)	**MW-311**	**-4.997**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Welch`s**
Field pH (Std. Units)	MW-309	-2.117	Yes	Yes	Yes	No	0.01	No	(intrawell)	Welch`s
Field pH (Std. Units)	**MW-310**	**-3.084**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Welch`s**
Field pH (Std. Units)	MW-311	-1.517	Yes	Yes	No	No	0.01	No	(intrawell)	Welch`s
Sulfate (mg/L)	MW-309	1.149	Yes	No	No	No	0.01	No	(intrawell)	Welch`s
Sulfate (mg/L)	MW-310 (bg)	1.956	Yes	No	No	No	0.01	No	(intrawell)	Mann-W (normality)
Sulfate (mg/L)	MW-311	-1.502	Yes	Yes	No	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	MW-309	1.023	Yes	No	No	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	MW-310	2.177	Yes	Yes	Yes	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	MW-311	-1.344	Yes	No	No	No	0.01	No	(intrawell)	Welch`s



t = 5.215 (two-tail)

Alpha	Table	Sig.
0.2	0.859	Yes
0.1	1.323	Yes
0.05	1.721	Yes
0.02	2.189	Yes
0.01	2.518	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8951, critical = 0.818.

Welch's t-test Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

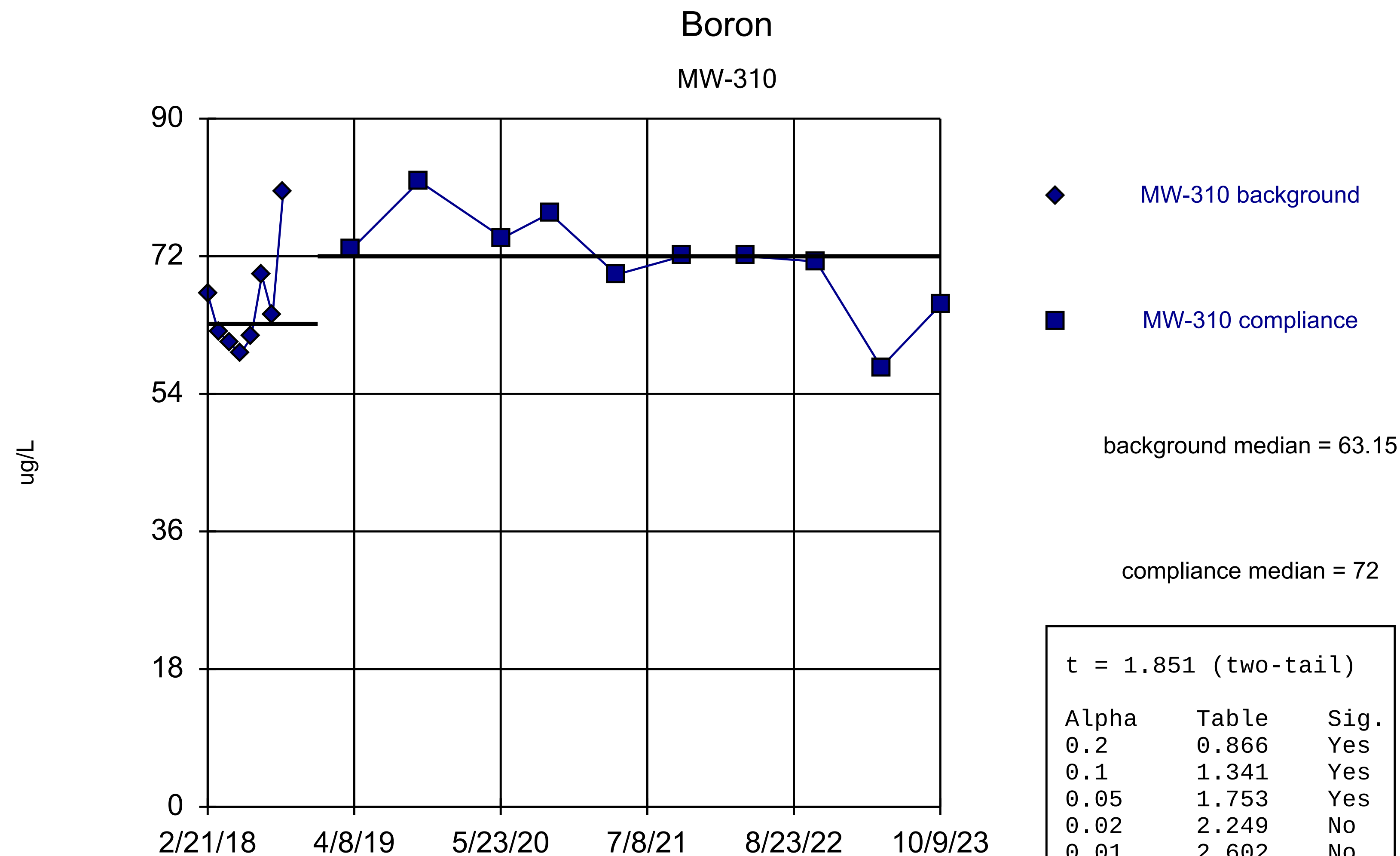
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Boron (ug/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	31.4	
3/23/2018	31	
4/23/2018	30.4	
5/24/2018	28	
6/23/2018	26.6	
7/23/2018	35.5	
8/22/2018	40.5	
9/21/2018	30	
4/2/2019		37.4
10/8/2019		33.4
5/29/2020		54.6
6/30/2020		50.7
8/6/2020		55.3
12/11/2020		65.9 (R)
6/11/2021		49.9 (R)
10/14/2021		42.9
12/21/2021		36.4
4/12/2022		32.5
10/26/2022		46.6
11/30/2022		49.3
4/26/2023		50.8
6/29/2023		59.4
10/9/2023		41.5




```
t = 1.851 (two-tail)

Alpha      Table      Sig.
0.2        0.866      Yes
0.1        1.341      Yes
0.05       1.753      Yes
0.02       2.249      No
0.01       2.602      No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8407, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Boron (ug/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	67.1	
3/23/2018	62.1	
4/23/2018	60.7	
5/24/2018	59.2	
6/23/2018	61.4	
7/23/2018	69.5	
8/22/2018	64.2	
9/21/2018	80.3	
4/2/2019		73
10/8/2019		81.8
5/29/2020		74.4
10/8/2020		77.6
4/13/2021		69.6
10/14/2021		72
4/12/2022		72
10/26/2022		71.3
4/26/2023		57.5
10/9/2023		65.6

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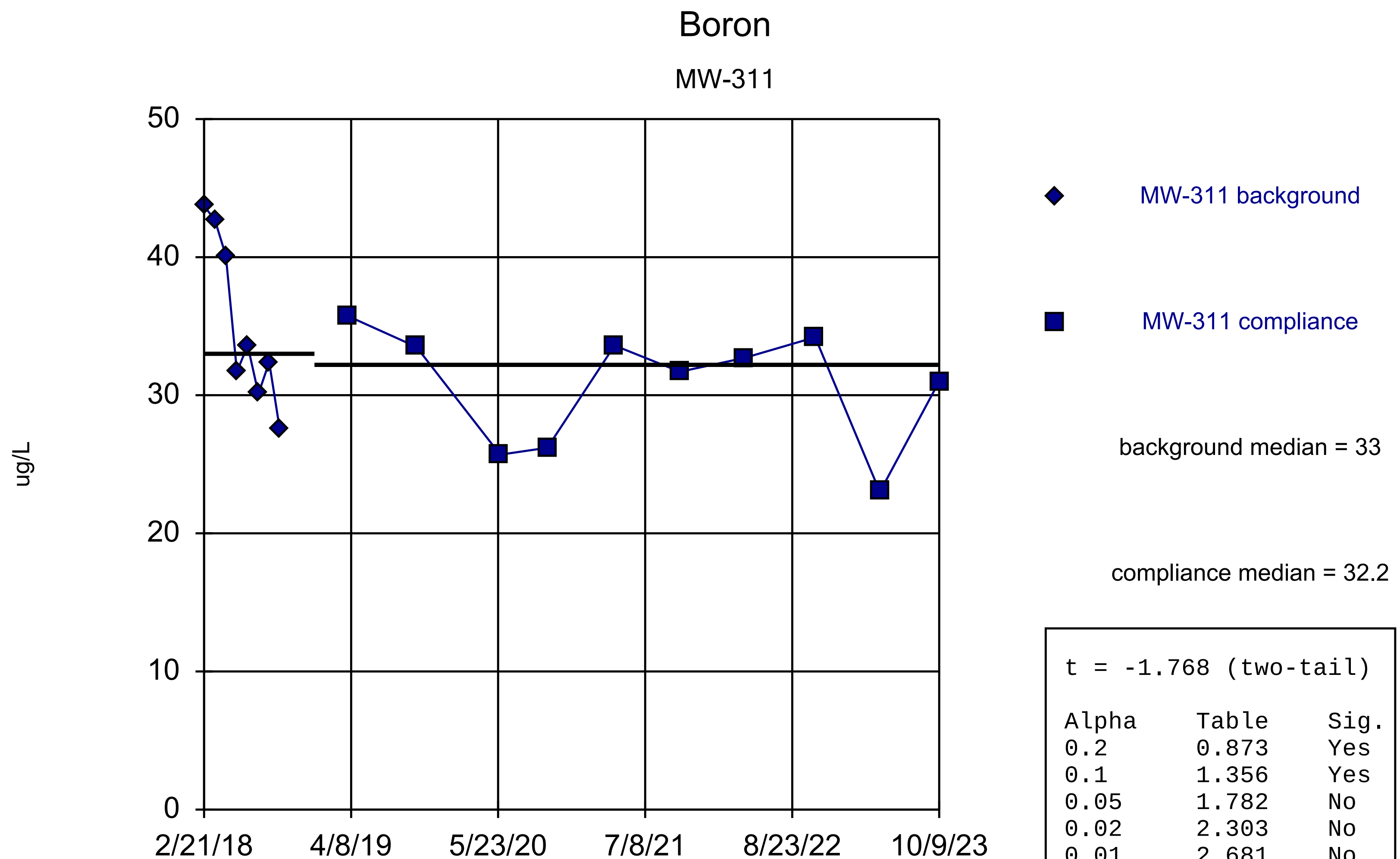

t = -1.768 (two-tail)

Alpha	Table	Sig.
0.2	0.873	Yes
0.1	1.356	Yes
0.05	1.782	No
0.02	2.303	No
0.01	2.681	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9014, critical = 0.818.

Welch's t-test Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Boron (ug/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	43.7	
3/23/2018	42.7	
4/23/2018	40.1	
5/24/2018	31.7	
6/23/2018	33.6	
7/23/2018	30.1	
8/22/2018	32.4	
9/21/2018	27.5	
4/2/2019		35.7
10/8/2019		33.5
5/29/2020		25.7
10/8/2020		26.2
4/14/2021		33.6
10/14/2021		31.7
4/12/2022		32.7
10/27/2022		34.2
4/26/2023		23
10/9/2023		31

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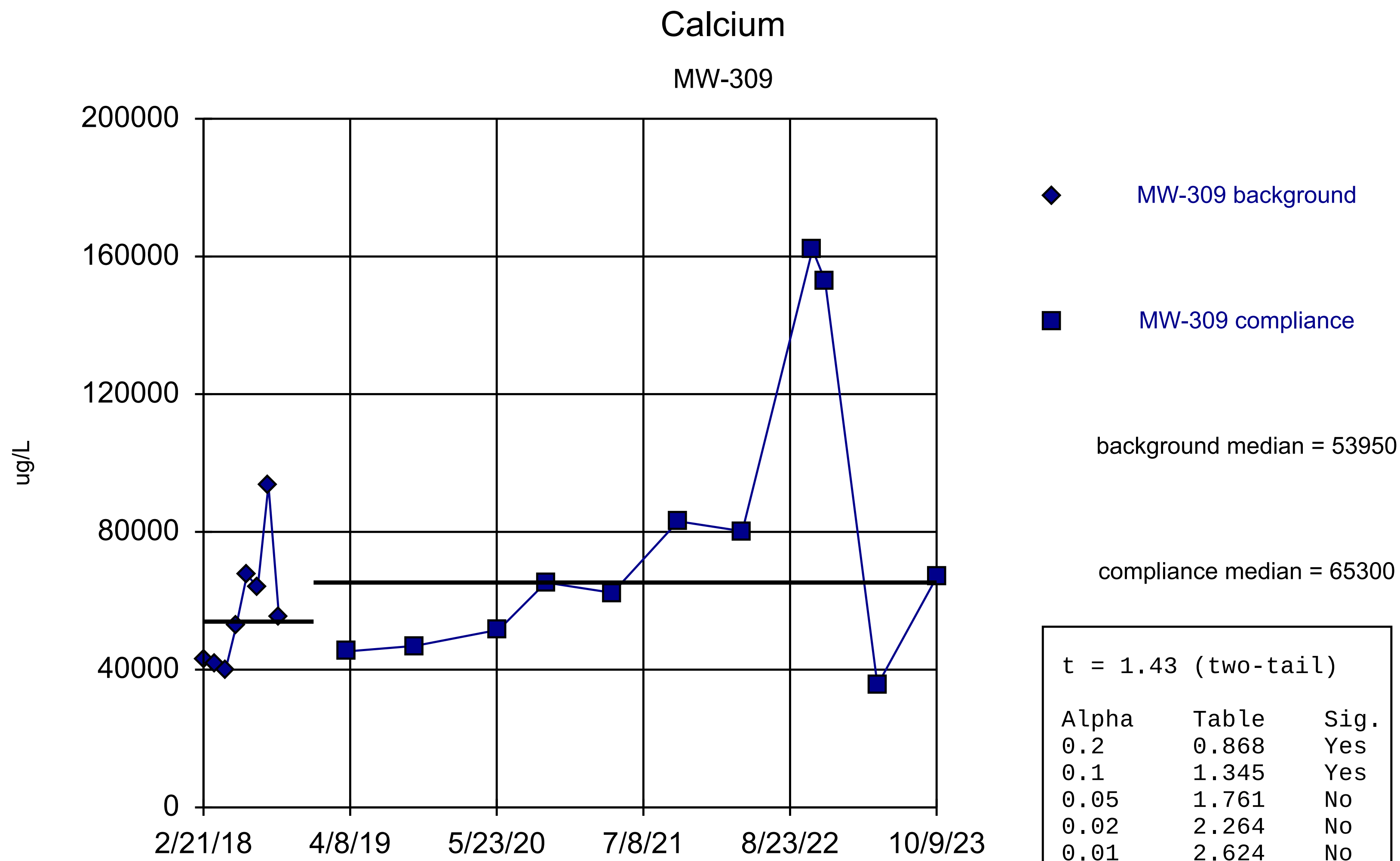


t = 1.43 (two-tail)

Alpha	Table	Sig.
0.2	0.868	Yes
0.1	1.345	Yes
0.05	1.761	No
0.02	2.264	No
0.01	2.624	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8834, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

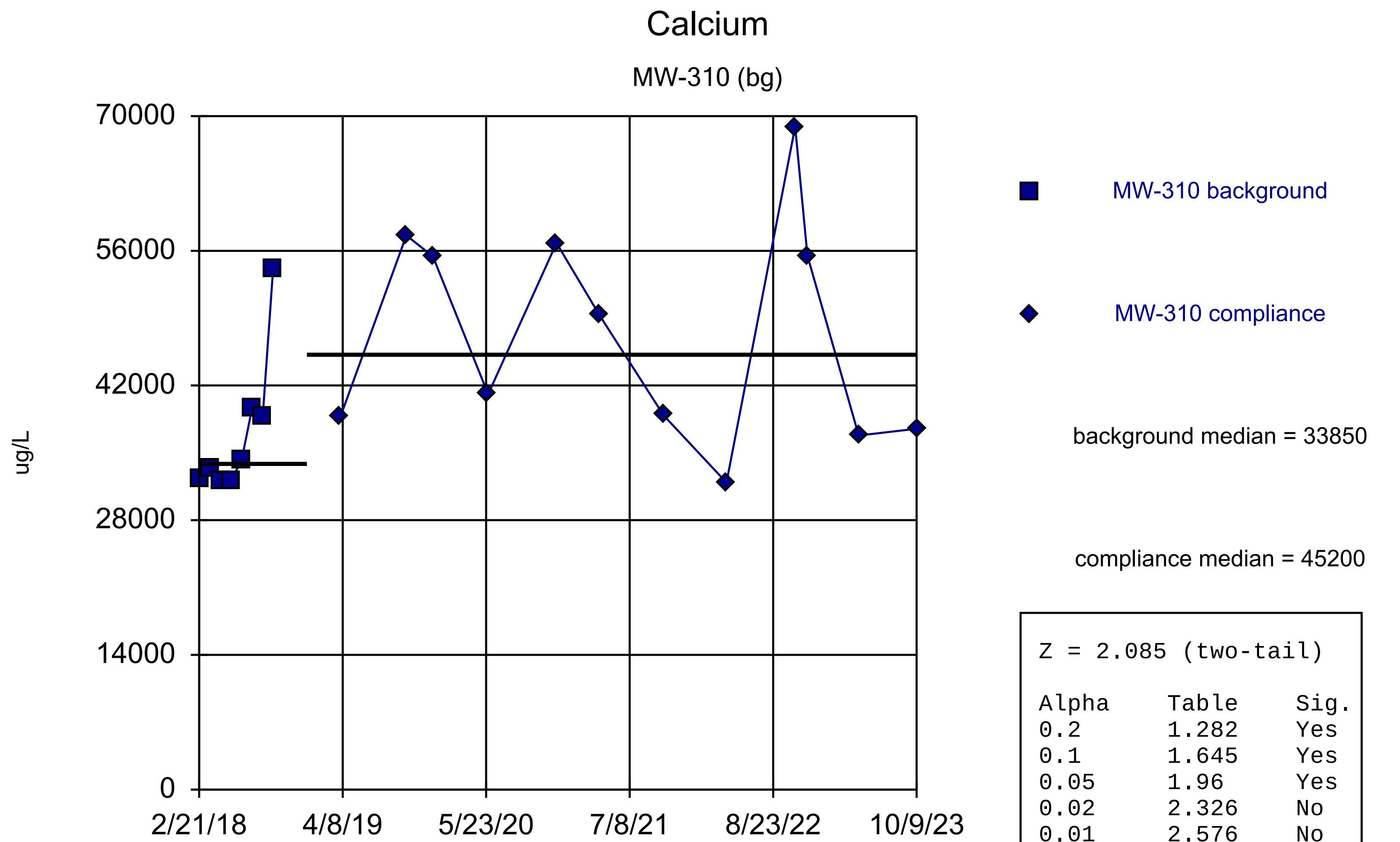
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Calcium (ug/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	42700	
3/23/2018	41800	
4/23/2018	39600	
5/24/2018	52700	
6/23/2018	67600	
7/23/2018	63800	
8/22/2018	93600	
9/21/2018	55200	
4/2/2019		45300
10/8/2019		46900
5/29/2020		51600
10/8/2020		65300
4/13/2021		62300
10/14/2021		83100
4/12/2022		80200
10/26/2022		162000
11/30/2022		153000
4/26/2023		35500
10/9/2023		66800




```
Z = 2.085 (two-tail)

Alpha     Table     Sig.
0.2       1.282     Yes
0.1       1.645     Yes
0.05      1.96      Yes
0.02      2.326     No
0.01      2.576     No
```

Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level.

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

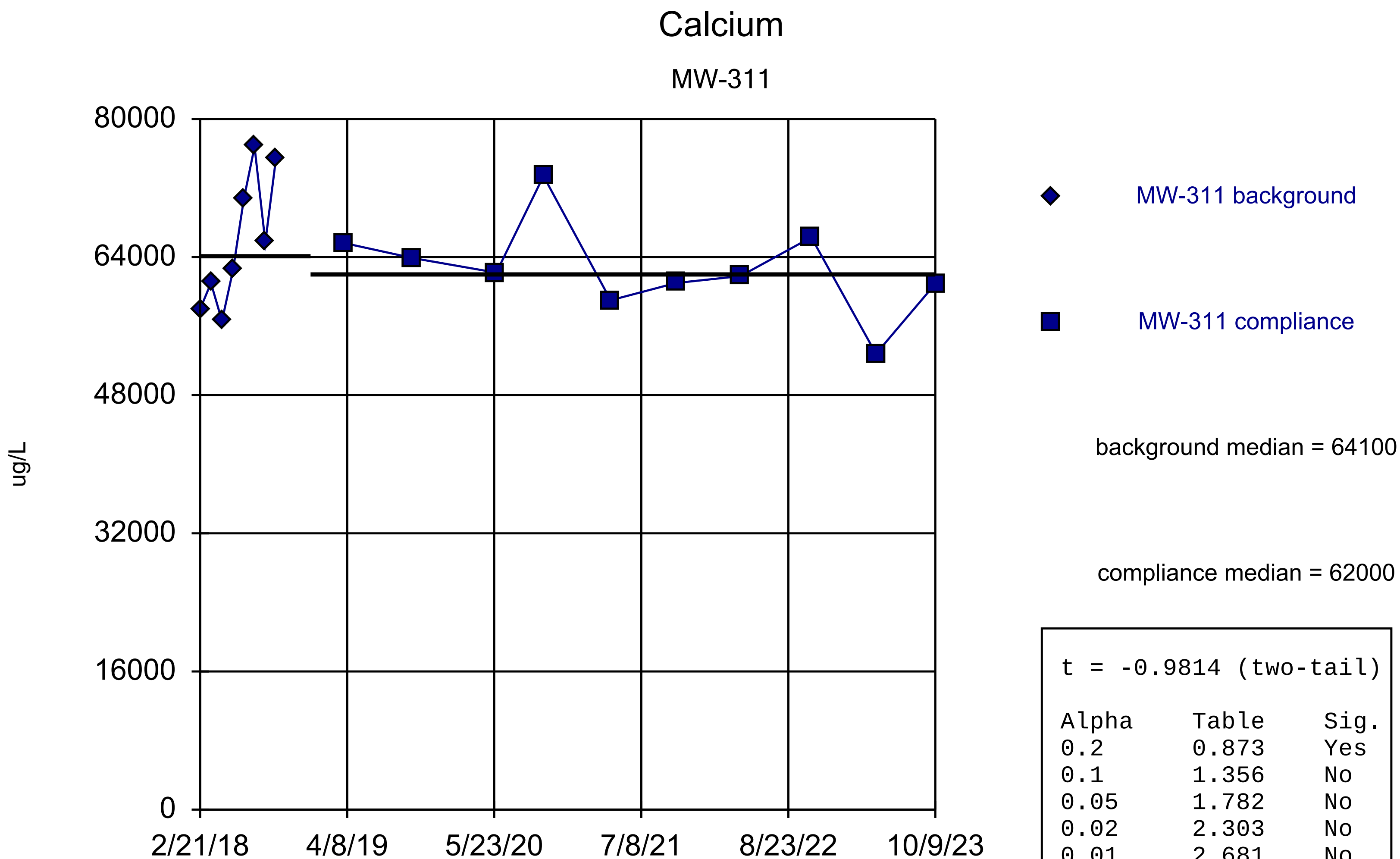
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Calcium (ug/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	32400	
3/23/2018	33400	
4/23/2018	32100	
5/24/2018	32100	
6/23/2018	34300	
7/23/2018	39700	
8/22/2018	38800	
9/21/2018	54100	
4/2/2019		38800
10/8/2019		57600
12/23/2019		55400
5/29/2020		41100
12/11/2020		56800 (R)
4/13/2021		49300
10/14/2021		38900
4/12/2022		31900
10/26/2022		68900
11/30/2022		55500
4/26/2023		36800
10/9/2023		37500



t = -0.9814 (two-tail)

Alpha	Table	Sig.
0.2	0.873	Yes
0.1	1.356	No
0.05	1.782	No
0.02	2.303	No
0.01	2.681	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9222, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

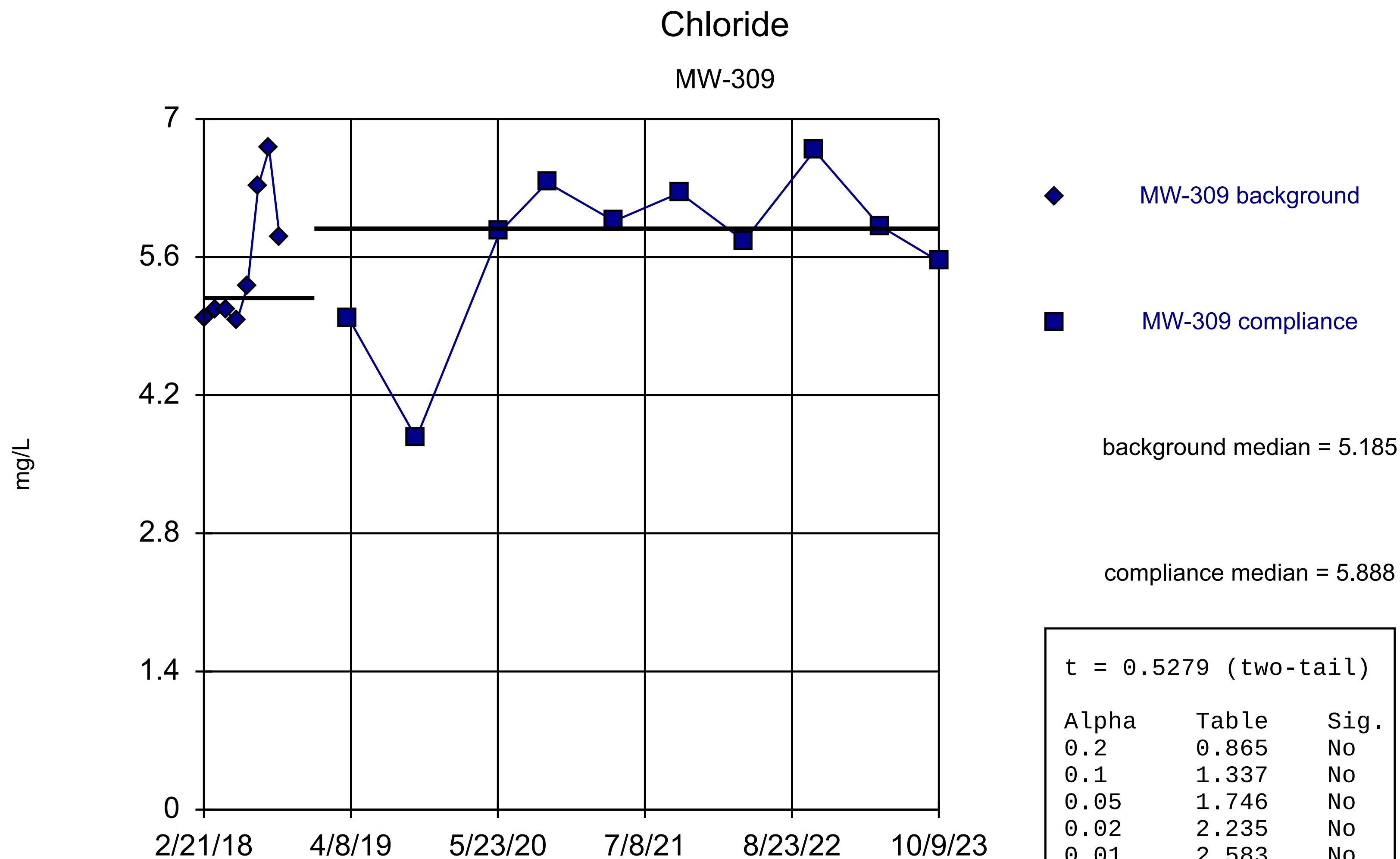
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Calcium (ug/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	58000	
3/23/2018	61000	
4/23/2018	56600	
5/24/2018	62500	
6/23/2018	70700	
7/23/2018	76800	
8/22/2018	65700	
9/21/2018	75400	
4/2/2019		65600
10/8/2019		63900
5/29/2020		62200
10/8/2020		73400
4/14/2021		59000
10/14/2021		61000
4/12/2022		61800
10/27/2022		66300
4/26/2023		52800
10/9/2023		60900



t = 0.5279 (two-tail)

Alpha	Table	Sig.
0.2	0.865	No
0.1	1.337	No
0.05	1.746	No
0.02	2.235	No
0.01	2.583	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8269 after natural log transformation, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Chloride (mg/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	147	
3/23/2018	157	
4/23/2018	157	
5/24/2018	141	
6/23/2018	203	
7/23/2018	557	
8/22/2018	811	
9/21/2018	329	
4/2/2019		145
10/8/2019		43.2
5/29/2020		350
10/8/2020		575
4/13/2021		390
10/14/2021		519
4/12/2022		319
10/26/2022		796
4/26/2023		372
10/9/2023		259

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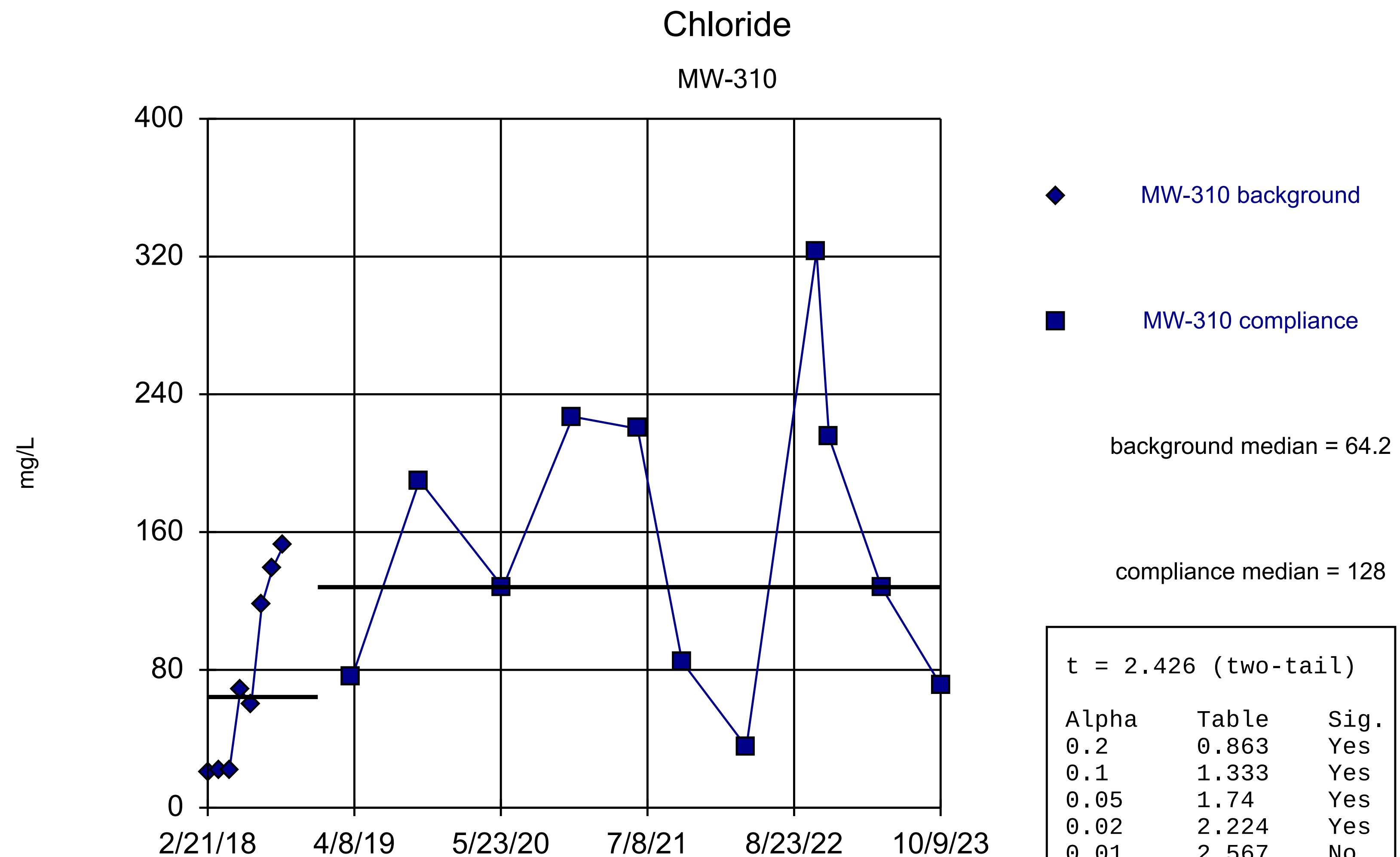



```
t = 2.426 (two-tail)

Alpha     Table     Sig.
0.2       0.863     Yes
0.1       1.333     Yes
0.05      1.74      Yes
0.02      2.224     Yes
0.01      2.567     No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8662, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

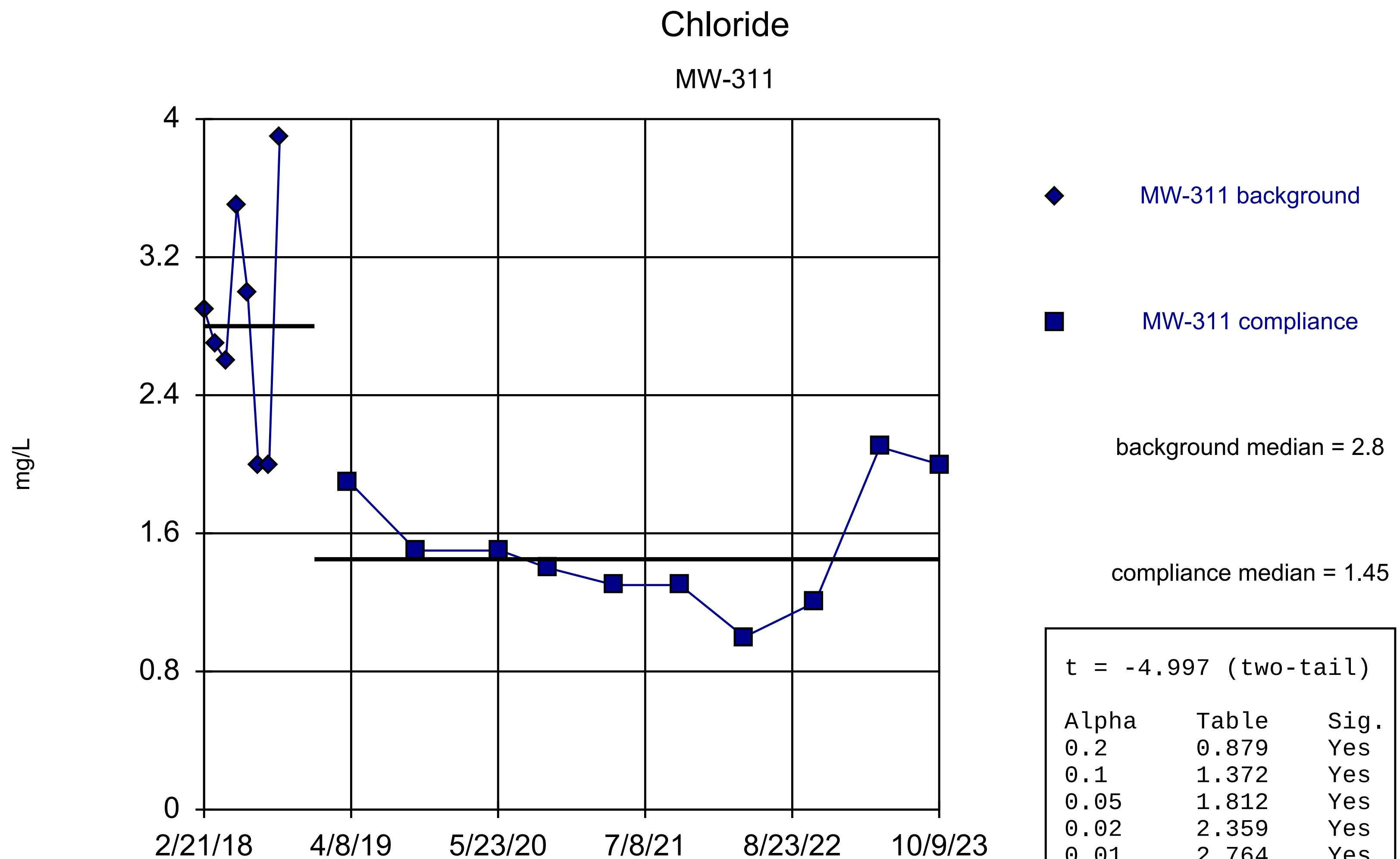
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Chloride (mg/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	19.8	
3/23/2018	21.7	
4/23/2018	22.1	
5/24/2018	68.6	
6/23/2018	59.8	
7/23/2018	118	
8/22/2018	139	
9/21/2018	152	
4/2/2019		76
10/8/2019		190
5/29/2020		128
12/11/2020		227 (R)
6/11/2021		220 (R)
10/14/2021		84.6
4/12/2022		35.2
10/26/2022		323
11/30/2022		215
4/26/2023		128
10/9/2023		71.3




```
t = -4.997 (two-tail)

Alpha     Table     Sig.
0.2       0.879     Yes
0.1       1.372     Yes
0.05      1.812     Yes
0.02      2.359     Yes
0.01      2.764     Yes
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9458, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Chloride (mg/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	2.9	
3/23/2018	2.7	
4/23/2018	2.6	
5/24/2018	3.5	
6/23/2018	3	
7/23/2018	2 (J)	
8/22/2018	2 (J)	
9/21/2018	3.9	
4/2/2019		1.9 (J)
10/8/2019		1.5 (J)
5/29/2020		1.5 (J)
10/8/2020		1.4 (J)
4/14/2021		1.3 (J)
10/14/2021		1.3 (J)
4/12/2022		1 (J)
10/27/2022		1.2 (J)
4/26/2023		2.1
10/9/2023		2 (J)

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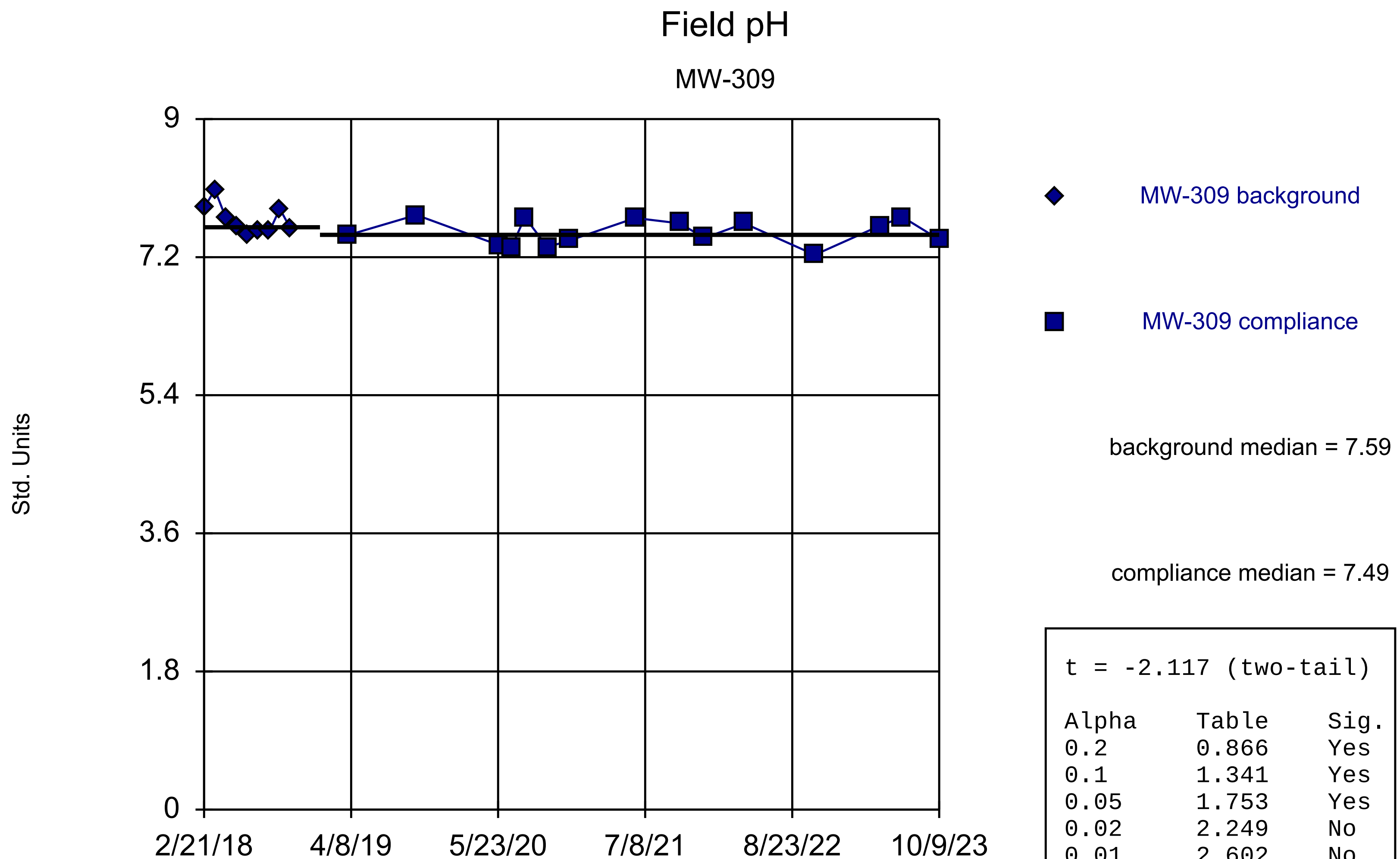



```
t = -2.117 (two-tail)

Alpha     Table     Sig.
0.2       0.866     Yes
0.1       1.341     Yes
0.05      1.753     Yes
0.02      2.249     No
0.01      2.602     No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8645, critical = 0.829.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

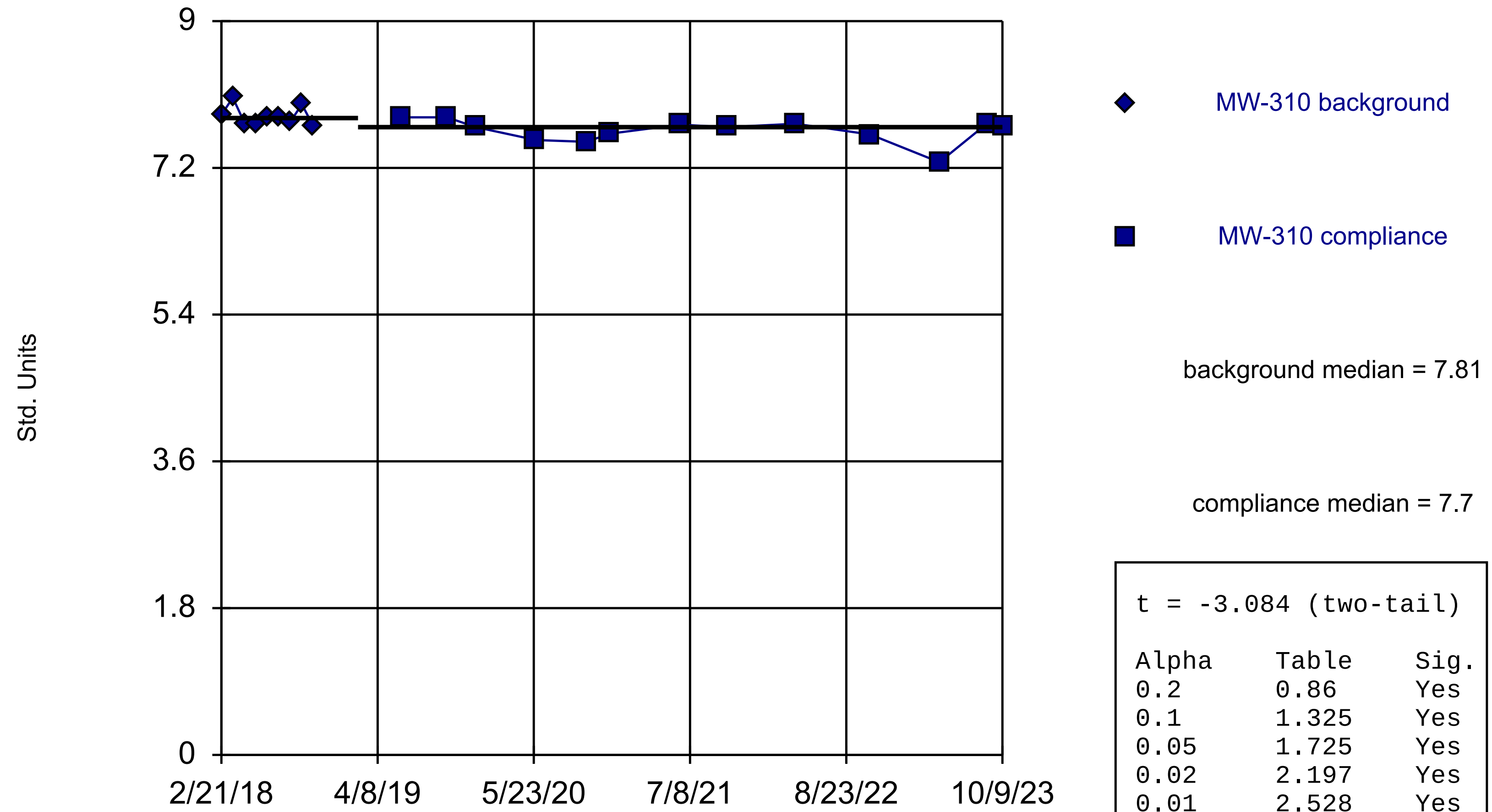
Constituent: Field pH (Std. Units)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	7.84	
3/23/2018	8.08	
4/23/2018	7.71	
5/24/2018	7.59	
6/23/2018	7.5	
7/23/2018	7.55	
8/22/2018	7.53	
9/21/2018	7.83	
10/22/2018	7.56	
4/2/2019		7.49
10/8/2019		7.75
5/29/2020		7.35
6/30/2020		7.33
8/6/2020		7.72
10/8/2020		7.33
12/11/2020		7.42
6/11/2021		7.71 (R)
10/14/2021		7.64
12/21/2021		7.45
4/12/2022		7.64
10/26/2022		7.23
4/26/2023		7.61
6/29/2023		7.72
10/9/2023		7.43

Field pH

MW-310



background median = 7.81

compliance median = 7.7

t = -3.084 (two-tail)

Alpha	Table	Sig.
0.2	0.86	Yes
0.1	1.325	Yes
0.05	1.725	Yes
0.02	2.197	Yes
0.01	2.528	Yes

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8877, critical = 0.829.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Field pH (Std. Units)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	7.85	
3/23/2018	8.06	
4/23/2018	7.75	
5/24/2018	7.74	
6/23/2018	7.82	
7/23/2018	7.81	
8/22/2018	7.77	
9/21/2018	7.98	
10/22/2018	7.7	
4/2/2019	9.79 (X)	
6/12/2019		7.82
10/8/2019		7.82
12/23/2019		7.7
5/29/2020		7.54
10/8/2020		7.52
12/11/2020		7.62
6/11/2021		7.73 (R)
10/14/2021		7.7
4/12/2022		7.74
10/26/2022		7.61
4/26/2023		7.27
8/31/2023		7.75
10/9/2023		7.7

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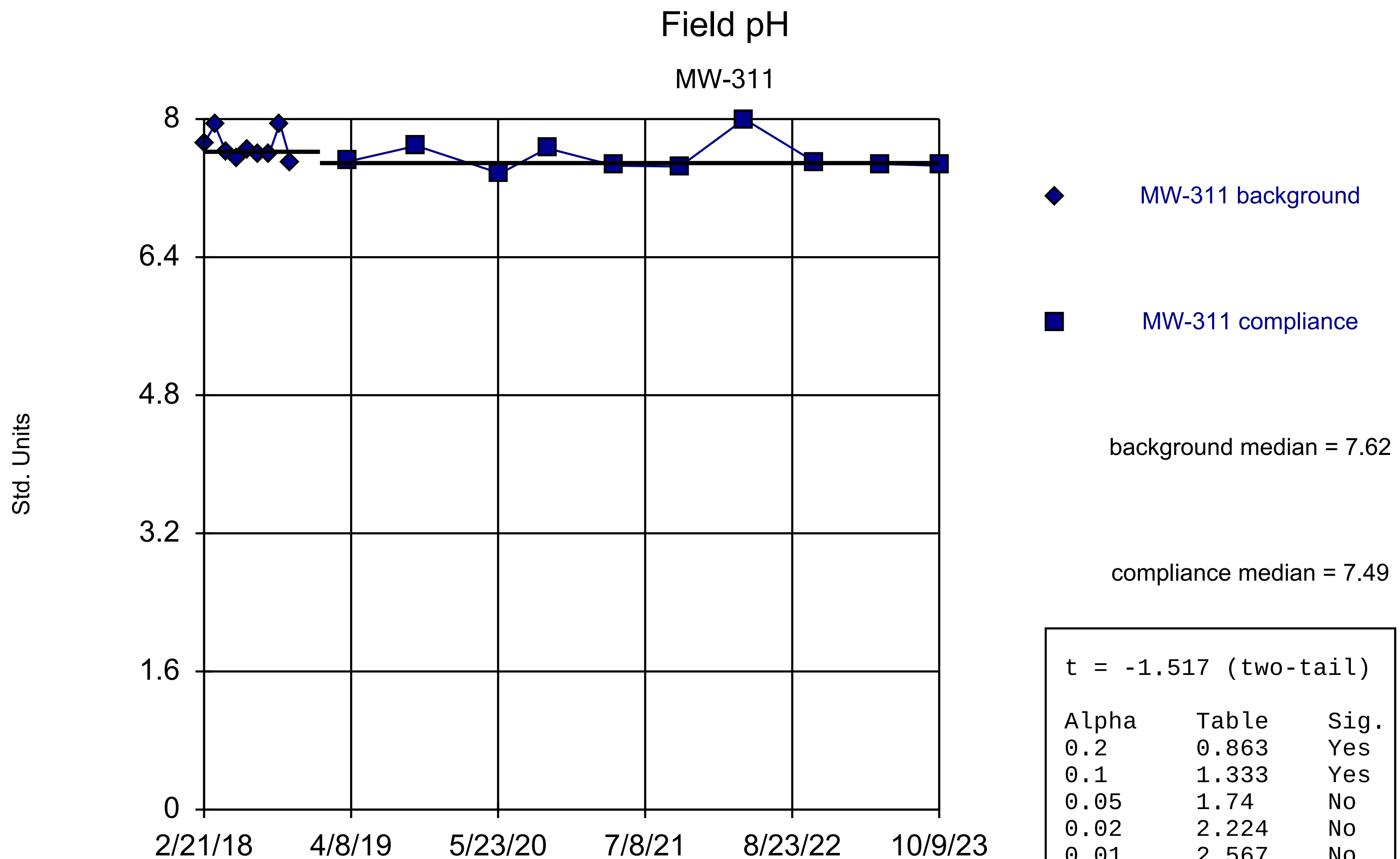



```
t = -1.517 (two-tail)

Alpha     Table     Sig.
0.2       0.863     Yes
0.1       1.333     Yes
0.05      1.74      No
0.02      2.224     No
0.01      2.567     No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8559, critical = 0.829.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

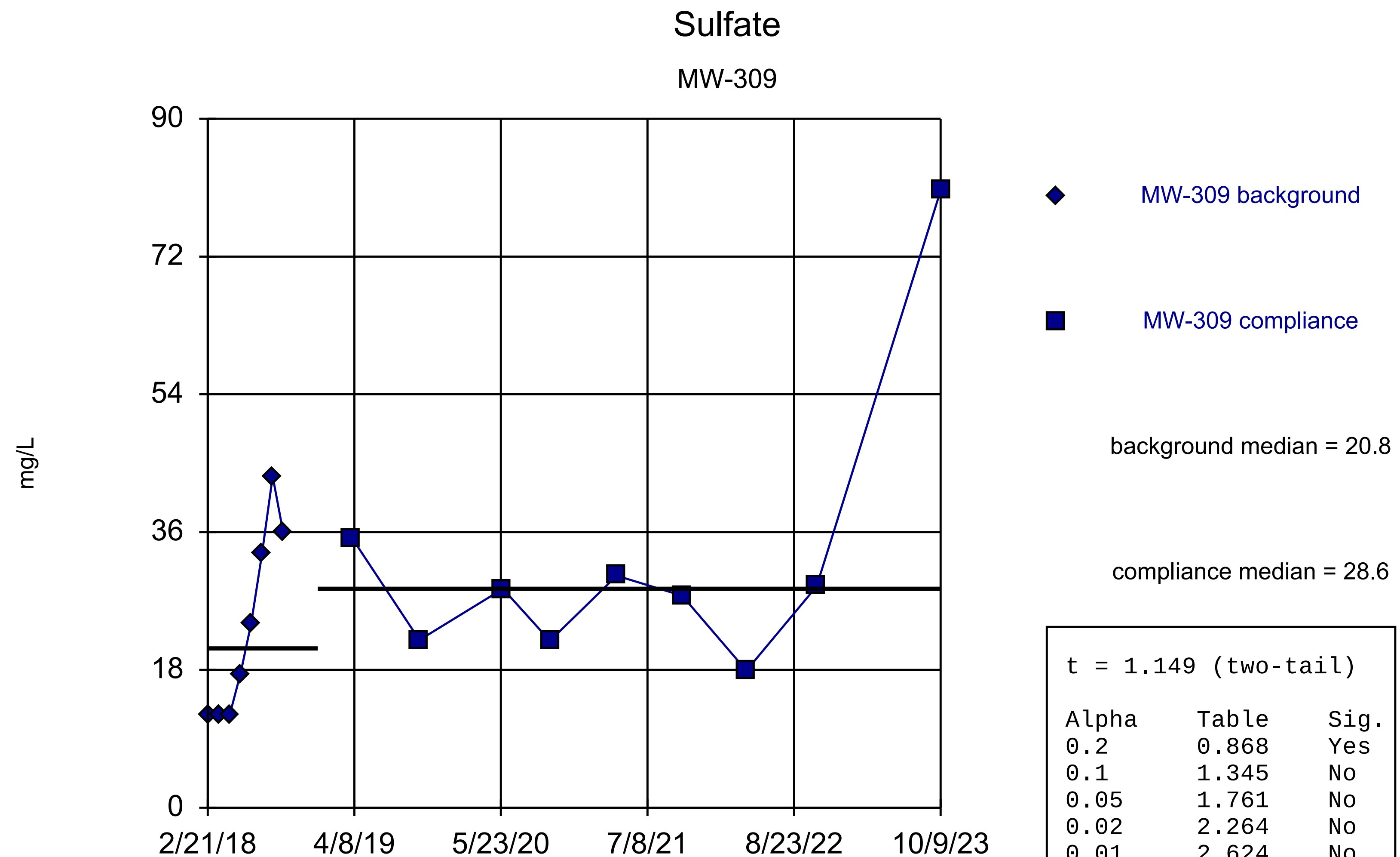
Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Field pH (Std. Units)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	7.72	
3/23/2018	7.93	
4/23/2018	7.62	
5/24/2018	7.54	
6/23/2018	7.65	
7/23/2018	7.59	
8/22/2018	7.6	
9/21/2018	7.95	
10/22/2018	7.5	
4/2/2019		7.51
10/8/2019		7.69
5/29/2020		7.37
10/8/2020		7.66
4/14/2021		7.46
10/14/2021		7.45
4/12/2022		8
10/27/2022		7.5
4/26/2023		7.48
10/9/2023		7.46



t = 1.149 (two-tail)

Alpha	Table	Sig.
0.2	0.868	Yes
0.1	1.345	No
0.05	1.761	No
0.02	2.264	No
0.01	2.624	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8739, critical = 0.818.

Welch's t-test Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

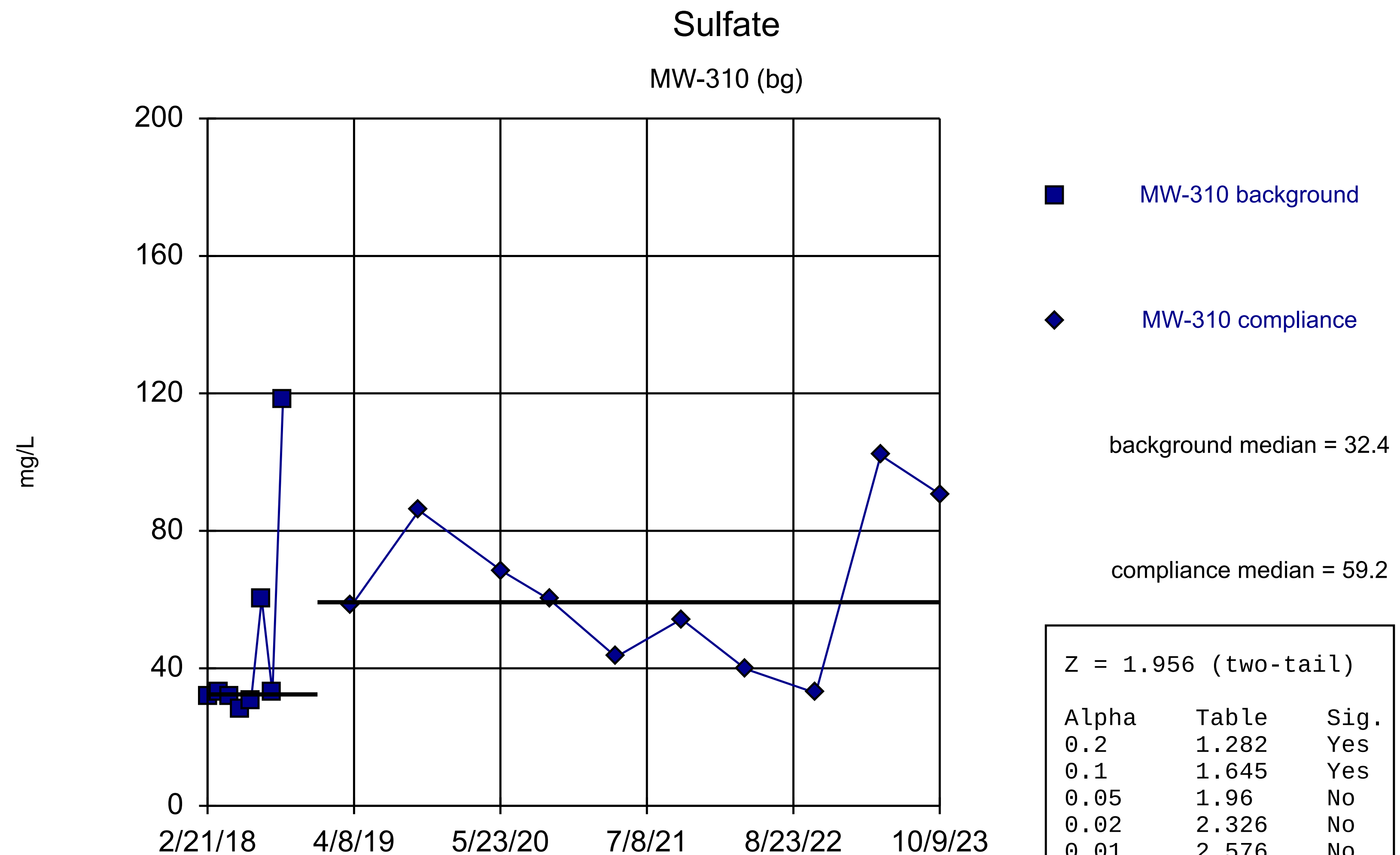
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Sulfate (mg/L)   Analysis Run 9/4/2024 9:03 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	12.2	
3/23/2018	12.2	
4/23/2018	12	
5/24/2018	17.5	
6/23/2018	24.1	
7/23/2018	33.1	
8/22/2018	43.3	
9/21/2018	35.9	
4/2/2019		35.2
10/8/2019		21.9
5/29/2020		28.6
10/8/2020		21.8
4/13/2021		30.3
10/14/2021		27.7
4/12/2022		17.9
10/26/2022		28.9
4/26/2023	143 (X)	
6/29/2023	147 (X)	
10/9/2023		80.6




```
Z = 1.956 (two-tail)

Alpha     Table     Sig.
0.2       1.282     Yes
0.1       1.645     Yes
0.05      1.96      No
0.02      2.326     No
0.01      2.576     No
```

Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level.

Mann-Whitney (Wilcoxon Rank Sum)   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Sulfate (mg/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	31.6	
3/23/2018	33.1	
4/23/2018	32	
5/24/2018	28	
6/23/2018	30.4	
7/23/2018	60.2	
8/22/2018	32.8	
9/21/2018	118	
4/2/2019		58.4
10/8/2019		85.9
5/29/2020		68.2
10/8/2020		60
4/13/2021		43.3
10/14/2021		54.3
4/12/2022		39.8
10/26/2022		32.8
4/26/2023		102
10/9/2023		90.7

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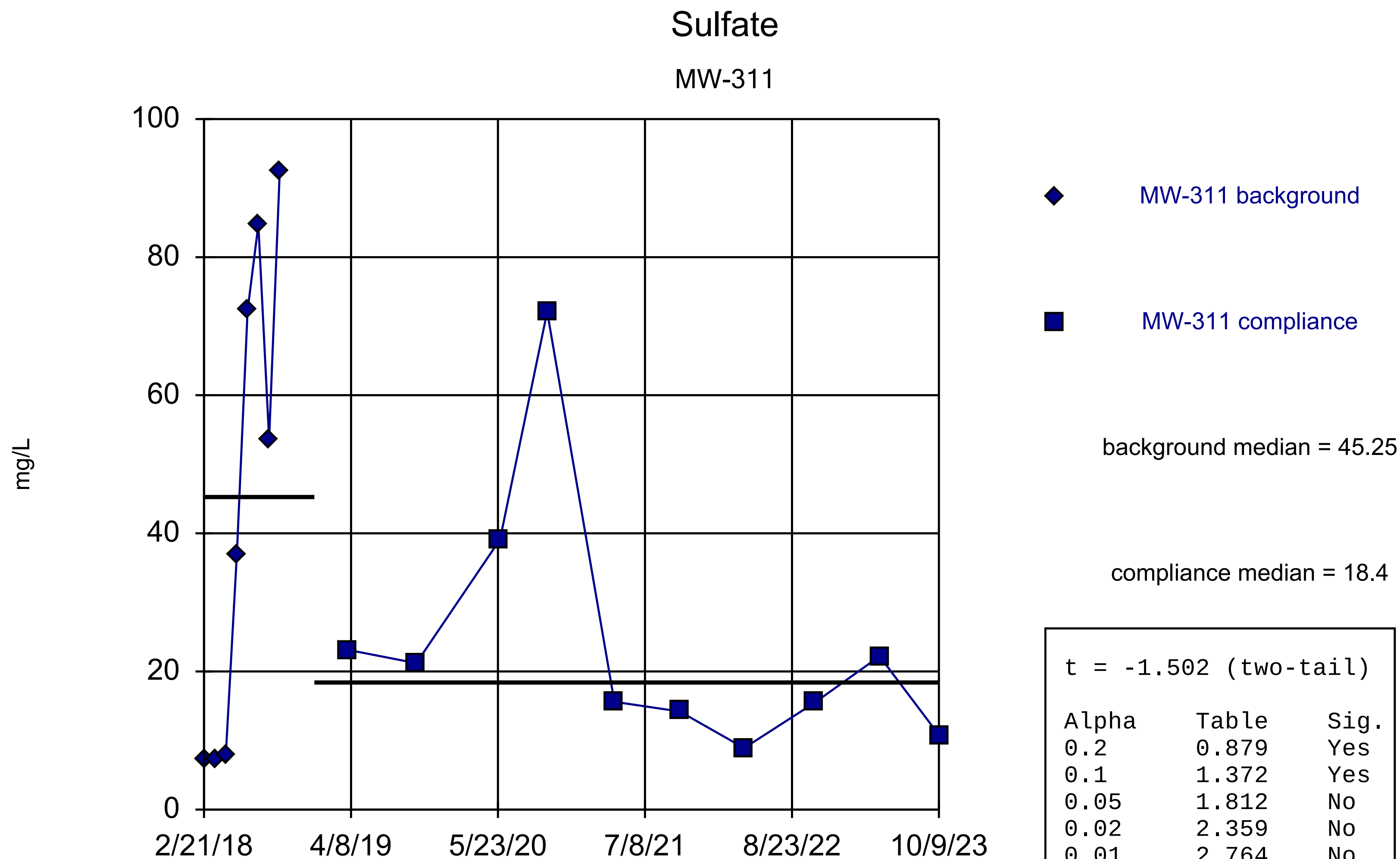


t = -1.502 (two-tail)

Alpha	Table	Sig.
0.2	0.879	Yes
0.1	1.372	Yes
0.05	1.812	No
0.02	2.359	No
0.01	2.764	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8714, critical = 0.818.

Welch's t-test Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

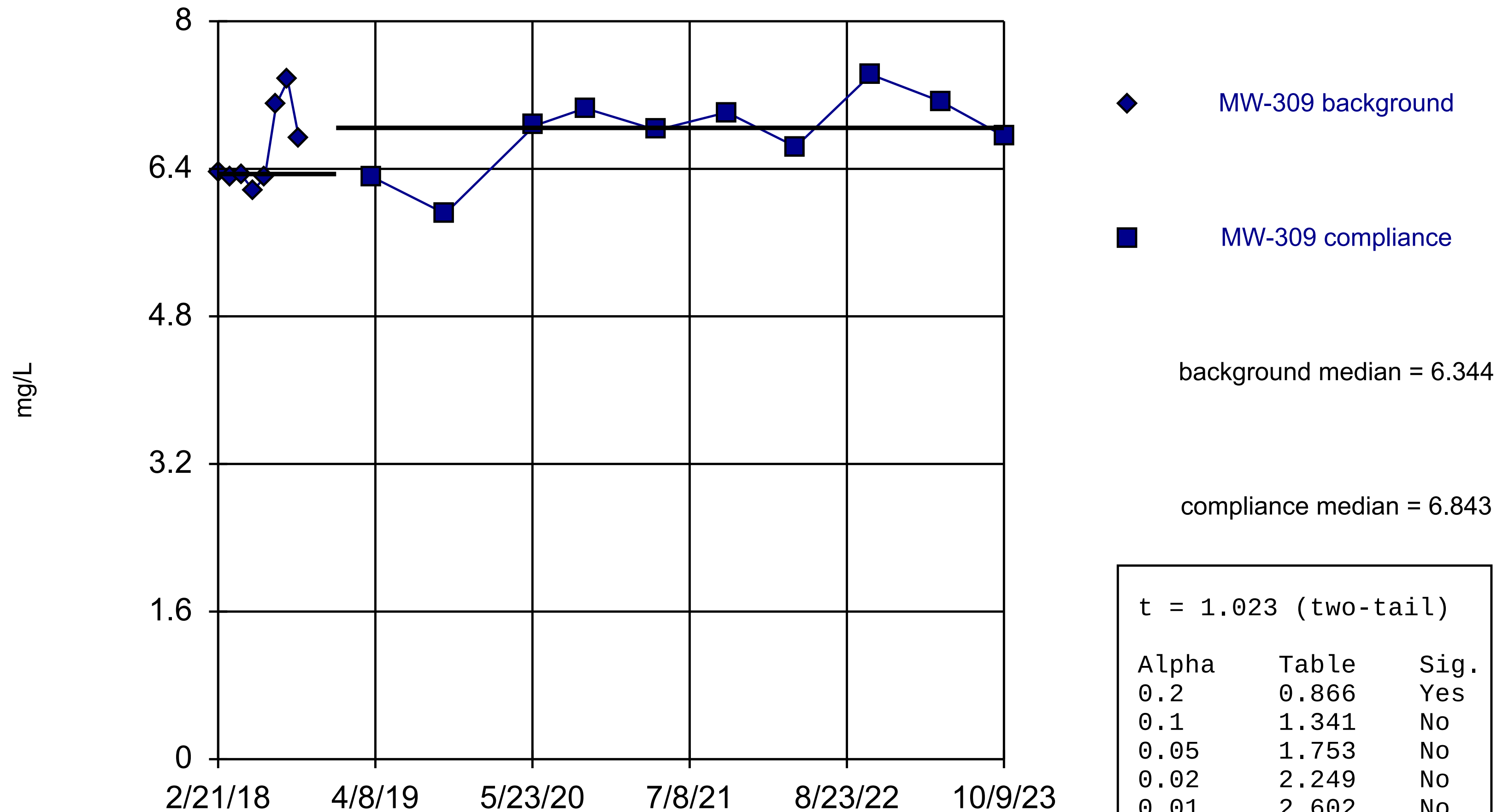
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Sulfate (mg/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	7.1	
3/23/2018	7.2	
4/23/2018	7.9	
5/24/2018	36.9	
6/23/2018	72.3	
7/23/2018	84.7	
8/22/2018	53.6	
9/21/2018	92.4	
4/2/2019		23.1
10/8/2019		21.2
5/29/2020		39.1
10/8/2020		72.1
4/14/2021		15.6
10/14/2021		14.2
4/12/2022		8.9
10/27/2022		15.5
4/26/2023		22.2
10/9/2023		10.8



t = 1.023 (two-tail)

Alpha	Table	Sig.
0.2	0.866	Yes
0.1	1.341	No
0.05	1.753	No
0.02	2.249	No
0.01	2.602	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8229 after natural log transformation, critical = 0.818.

Welch's t-test Analysis Run 9/4/2024 9:00 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Welch's t-test

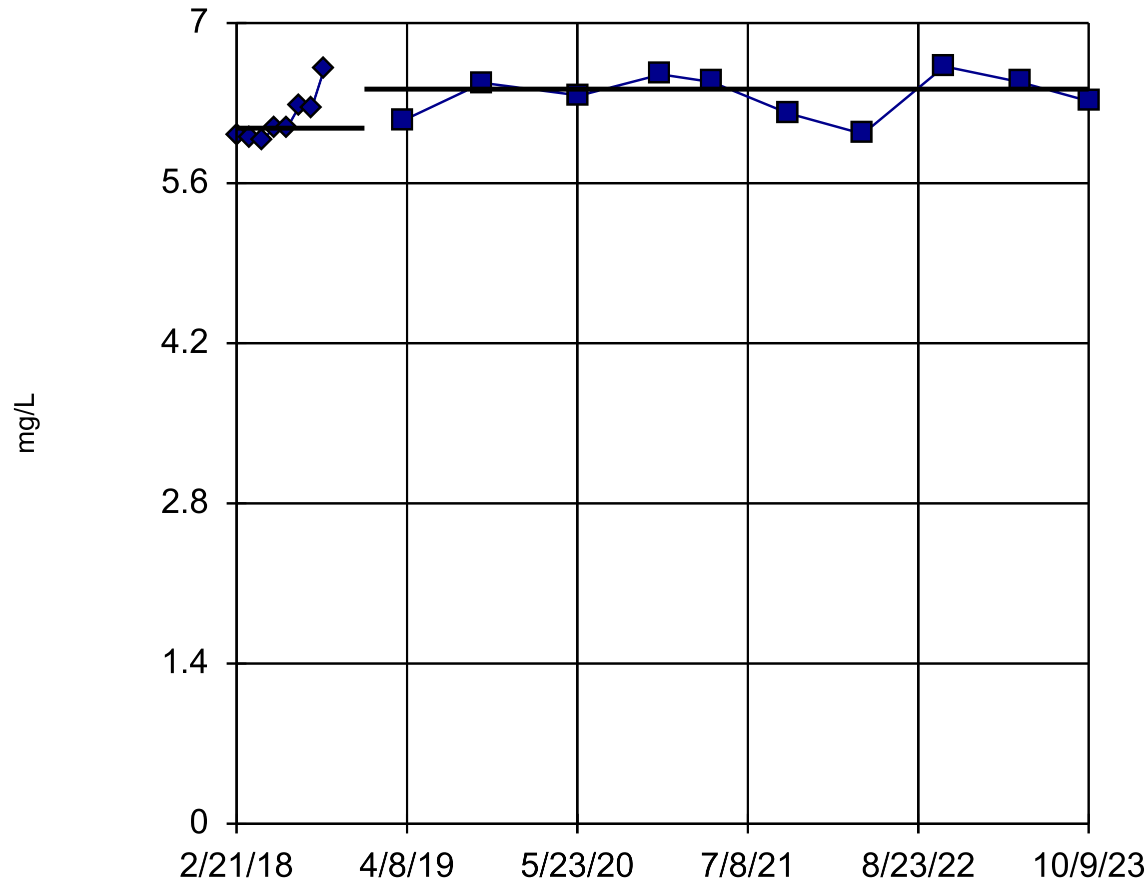
Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-309	MW-309
2/21/2018	576	
3/23/2018	552	
4/23/2018	562	
5/24/2018	478	
6/23/2018	548	
7/23/2018	1210	
8/22/2018	1570	
9/21/2018	830	
4/2/2019		548
10/8/2019		370
5/29/2020		960
10/8/2020		1160
4/13/2021		916
10/14/2021		1110
4/12/2022		764
10/26/2022		1670
4/26/2023		1250
10/9/2023		858

Total Dissolved Solids

MW-310



MW-310 background

MW-310 compliance

background median = 6.08

compliance median = 6.422

t = 2.177 (two-tail)

Alpha	Table	Sig.
0.2	0.868	Yes
0.1	1.345	Yes
0.05	1.761	Yes
0.02	2.264	No
0.01	2.624	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8258 after natural log transformation, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310	MW-310
2/21/2018	406	
3/23/2018	398	
4/23/2018	396	
5/24/2018	436	
6/23/2018	438	
7/23/2018	532	
8/22/2018	526	
9/21/2018	736	
4/2/2019		470
10/8/2019		650
5/29/2020		582
12/11/2020		700 (R)
4/13/2021		654
10/14/2021		498
4/12/2022		416
10/26/2022		750
4/26/2023		654
10/9/2023		554

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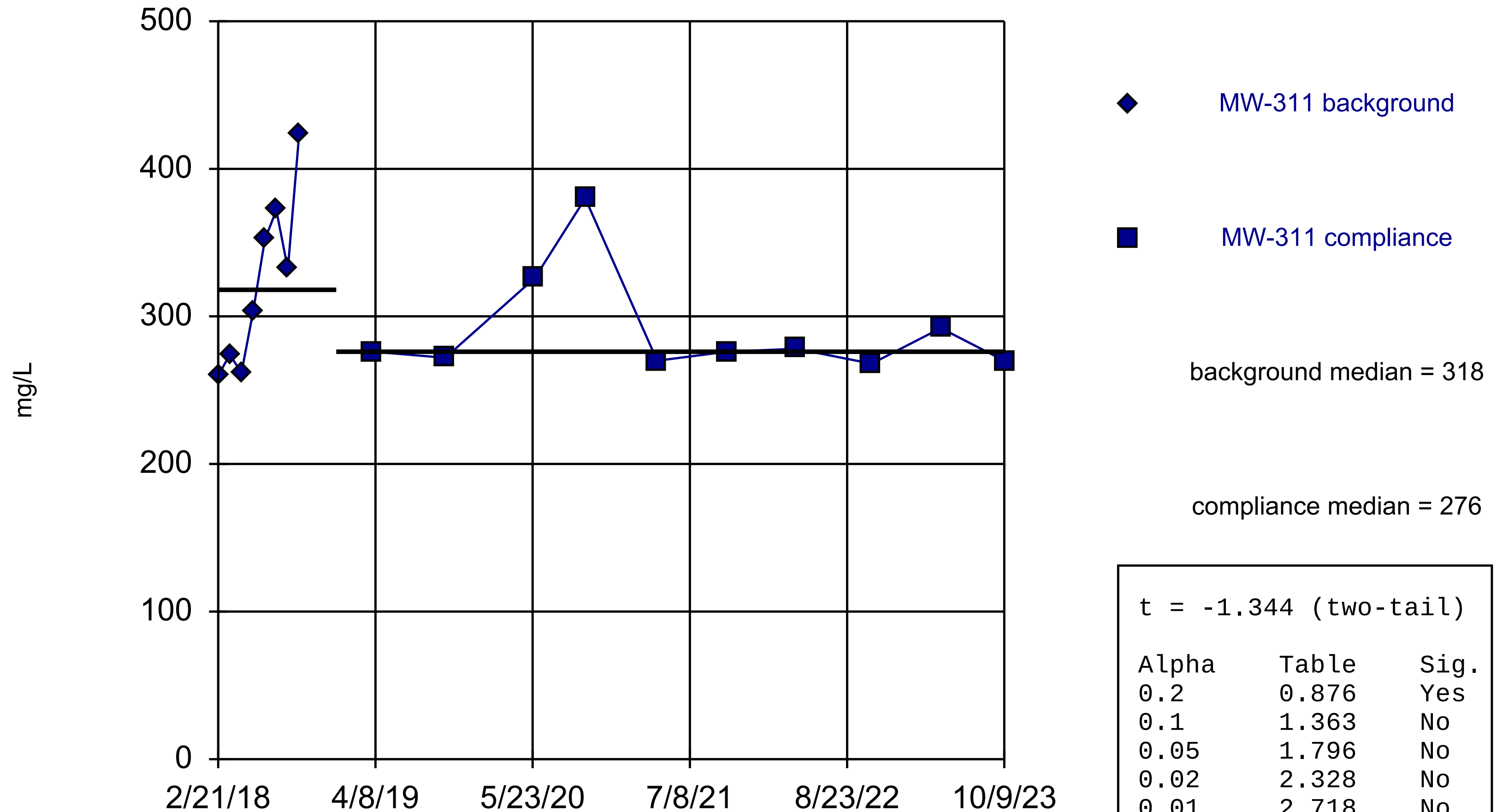
Total Dissolved Solids

MW-311



t = -1.344 (two-tail)

Alpha	Table	Sig.
0.2	0.876	Yes
0.1	1.363	No
0.05	1.796	No
0.02	2.328	No
0.01	2.718	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9288, critical = 0.818.

Welch's t-test   Analysis Run 9/4/2024 9:00 AM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Welch's t-test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/4/2024 9:03 AM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311	MW-311
2/21/2018	260	
3/23/2018	274	
4/23/2018	262	
5/24/2018	304	
6/23/2018	352	
7/23/2018	372	
8/22/2018	332	
9/21/2018	424	
4/2/2019		276
10/8/2019		272
5/29/2020		326
10/8/2020		380
4/14/2021		270
10/14/2021		276
4/12/2022		278
10/27/2022		268
4/26/2023		292
10/9/2023		270

Attachment 4

Intrawell Prediction Limit Analysis

Prediction Limit

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020   Printed 9/3/2024, 6:56 PM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	MW-309	61.9	n/a	1 future	n/a	23	n/a	41.74	11.09	0	None	No	0.002922	Param Intra 1 of 2
Boron (ug/L)	MW-310	82.4	n/a	1 future	n/a	18	n/a	68.85	7.174	0	None	No	0.002922	Param Intra 1 of 2
Boron (ug/L)	MW-311	43.1	n/a	1 future	n/a	18	n/a	32.73	5.495	0	None	No	0.002922	Param Intra 1 of 2
Calcium (ug/L)	MW-309	137000	n/a	1 future	n/a	19	n/a	11.05	0.417	0	None	ln(x)	0.002922	Param Intra 1 of 2
Calcium (ug/L)	MW-310	65700	n/a	1 future	n/a	20	n/a	10.65	0.2421	0	None	ln(x)	0.002922	Param Intra 1 of 2
Calcium (ug/L)	MW-311	76300	n/a	1 future	n/a	18	n/a	64089	6493	0	None	No	0.002922	Param Intra 1 of 2
Chloride (mg/L)	MW-309	772	n/a	1 future	n/a	18	n/a	348.3	225.2	0	None	No	0.002922	Param Intra 1 of 2
Chloride (mg/L)	MW-310	277	n/a	1 future	n/a	19	n/a	121	83.79	0	None	No	0.002922	Param Intra 1 of 2
Chloride (mg/L)	MW-311	3.67	n/a	1 future	n/a	18	n/a	2.1	0.8345	0	None	No	0.002922	Param Intra 1 of 2
Field pH (Std. Units)	MW-309	7.94	n/a	1 future	n/a	24	n/a	7.584	0.1949	0	None	No	0.002922	Param Intra 1 of 2
Field pH (Std. Units)	MW-310	8.02	n/a	1 future	n/a	22	n/a	7.727	0.1605	0	None	No	0.002922	Param Intra 1 of 2
Field pH (Std. Units)	MW-311	7.95	n/a	1 future	n/a	19	n/a	7.615	0.1791	0	None	No	0.002922	Param Intra 1 of 2
Sulfate (mg/L)	MW-309	64.6	n/a	1 future	n/a	17	n/a	3.226	0.4956	0	None	ln(x)	0.002922	Param Intra 1 of 2
Sulfate (mg/L)	MW-310	107	n/a	1 future	n/a	18	n/a	55.64	27.53	0	None	No	0.002922	Param Intra 1 of 2
Sulfate (mg/L)	MW-311	124	n/a	1 future	n/a	18	n/a	3.155	0.8864	0	None	ln(x)	0.002922	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-309	1600	n/a	1 future	n/a	18	n/a	885.1	379.2	0	None	No	0.002922	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-310	773	n/a	1 future	n/a	18	n/a	544.2	121.3	0	None	No	0.002922	Param Intra 1 of 2
Total Dissolved Solids (mg/L)	MW-311	380	n/a	1 future	n/a	18	n/a	n/a	n/a	0	n/a	n/a	0.01605	NP Intra (normality) ...

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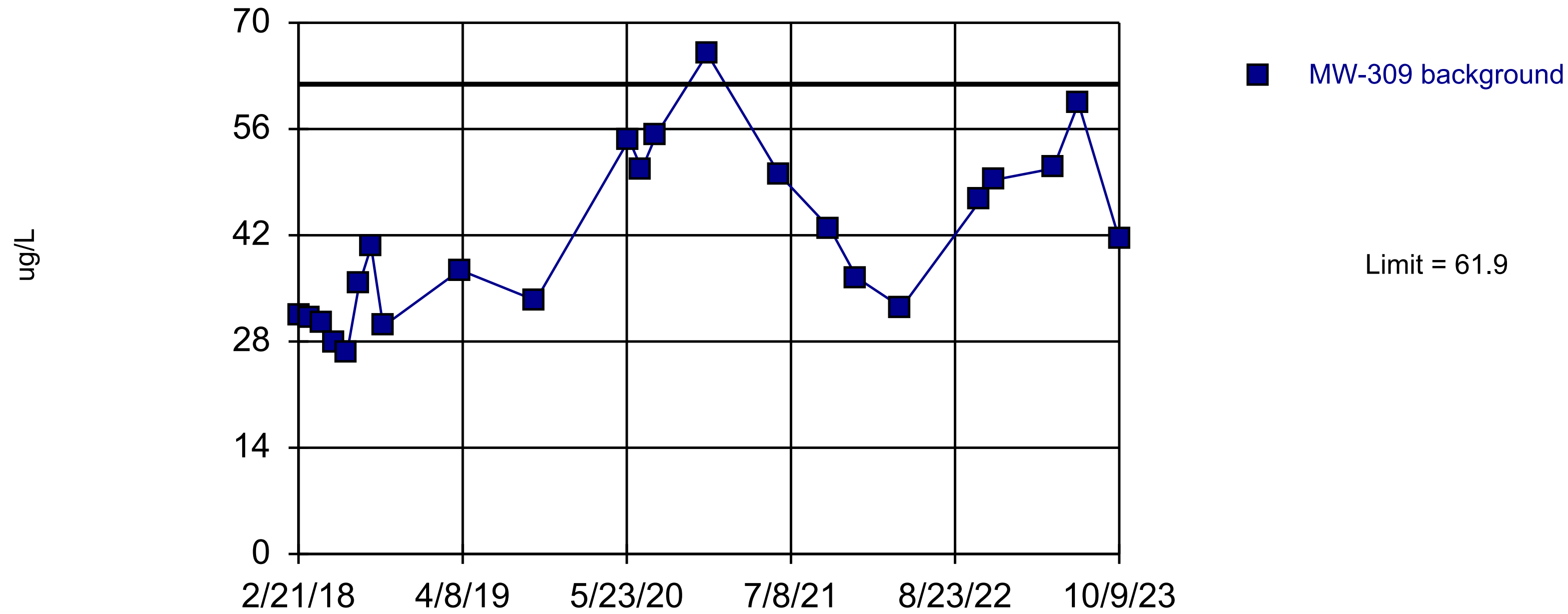
Boron

Intrawell Parametric, MW-309



Background Data Summary: Mean=41.74, Std. Dev.=11.09, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9416, critical = 0.881. Kappa = 1.814 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

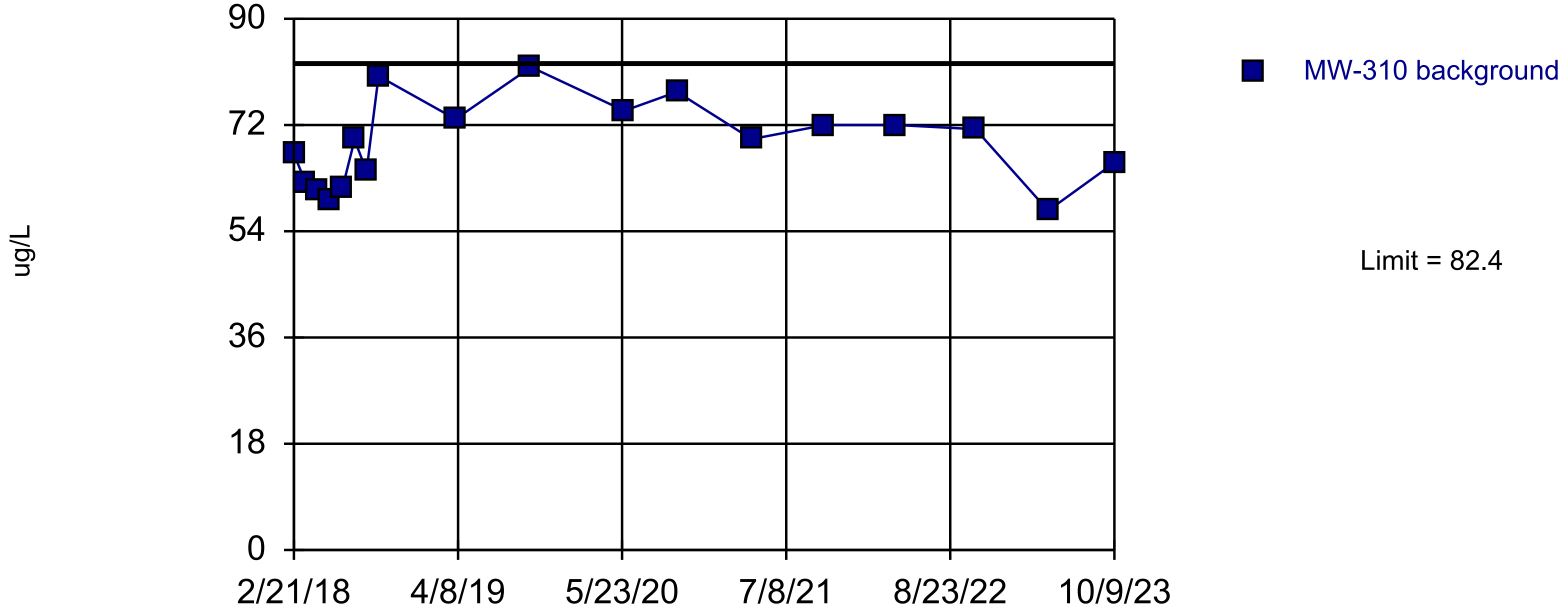
Constituent: Boron (ug/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	31.4
3/23/2018	31
4/23/2018	30.4
5/24/2018	28
6/23/2018	26.6
7/23/2018	35.5
8/22/2018	40.5
9/21/2018	30
4/2/2019	37.4
10/8/2019	33.4
5/29/2020	54.6
6/30/2020	50.7
8/6/2020	55.3
12/11/2020	65.9 (R)
6/11/2021	49.9 (R)
10/14/2021	42.9
12/21/2021	36.4
4/12/2022	32.5
10/26/2022	46.6
11/30/2022	49.3
4/26/2023	50.8
6/29/2023	59.4
10/9/2023	41.5

Boron

Intrawell Parametric, MW-310



Background Data Summary: Mean=68.85, Std. Dev.=7.174, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9676, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

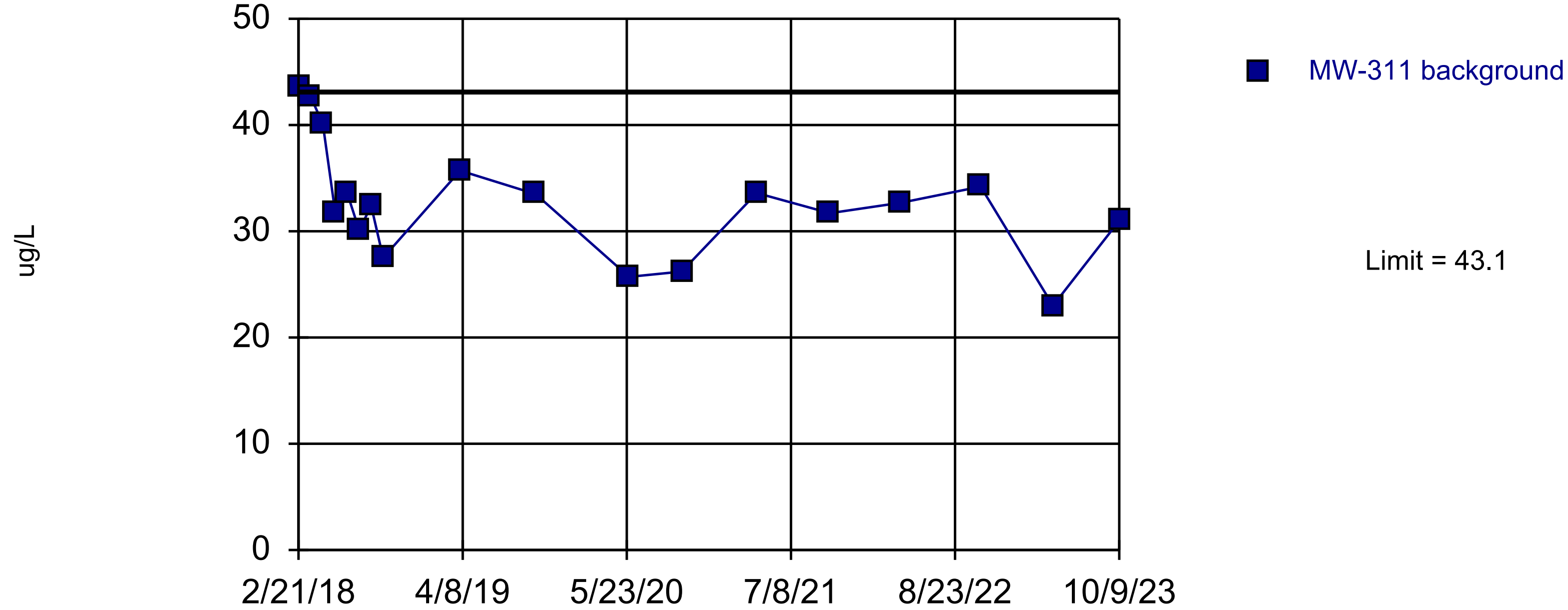
Constituent: Boron (ug/L) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	67.1
3/23/2018	62.1
4/23/2018	60.7
5/24/2018	59.2
6/23/2018	61.4
7/23/2018	69.5
8/22/2018	64.2
9/21/2018	80.3
4/2/2019	73
10/8/2019	81.8
5/29/2020	74.4
10/8/2020	77.6
4/13/2021	69.6
10/14/2021	72
4/12/2022	72
10/26/2022	71.3
4/26/2023	57.5
10/9/2023	65.6

Boron

Intrawell Parametric, MW-311



Background Data Summary: Mean=32.73, Std. Dev.=5.495, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9488, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

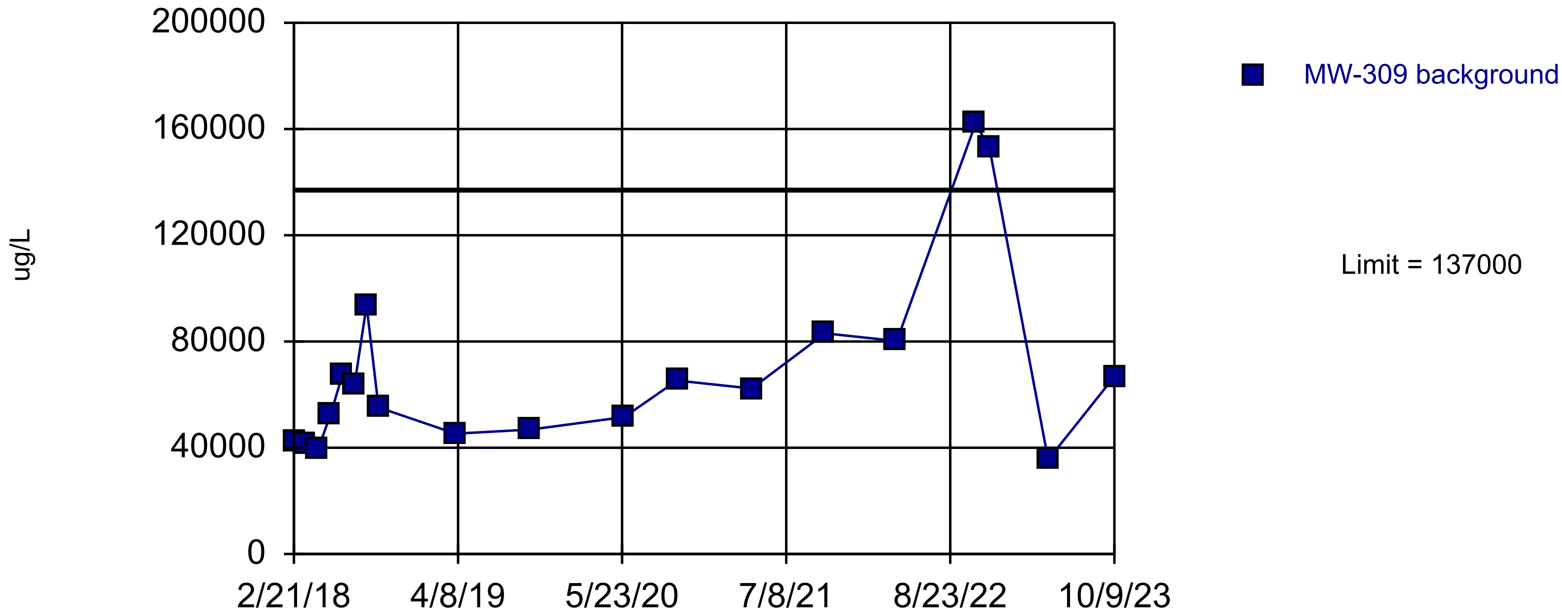
Constituent: Boron (ug/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	43.7
3/23/2018	42.7
4/23/2018	40.1
5/24/2018	31.7
6/23/2018	33.6
7/23/2018	30.1
8/22/2018	32.4
9/21/2018	27.5
4/2/2019	35.7
10/8/2019	33.5
5/29/2020	25.7
10/8/2020	26.2
4/14/2021	33.6
10/14/2021	31.7
4/12/2022	32.7
10/27/2022	34.2
4/26/2023	23
10/9/2023	31

Calcium

Intrawell Parametric, MW-309



Background Data Summary (based on natural log transformation): Mean=11.05, Std. Dev.=0.417, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9147, critical = 0.863. Kappa = 1.865 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

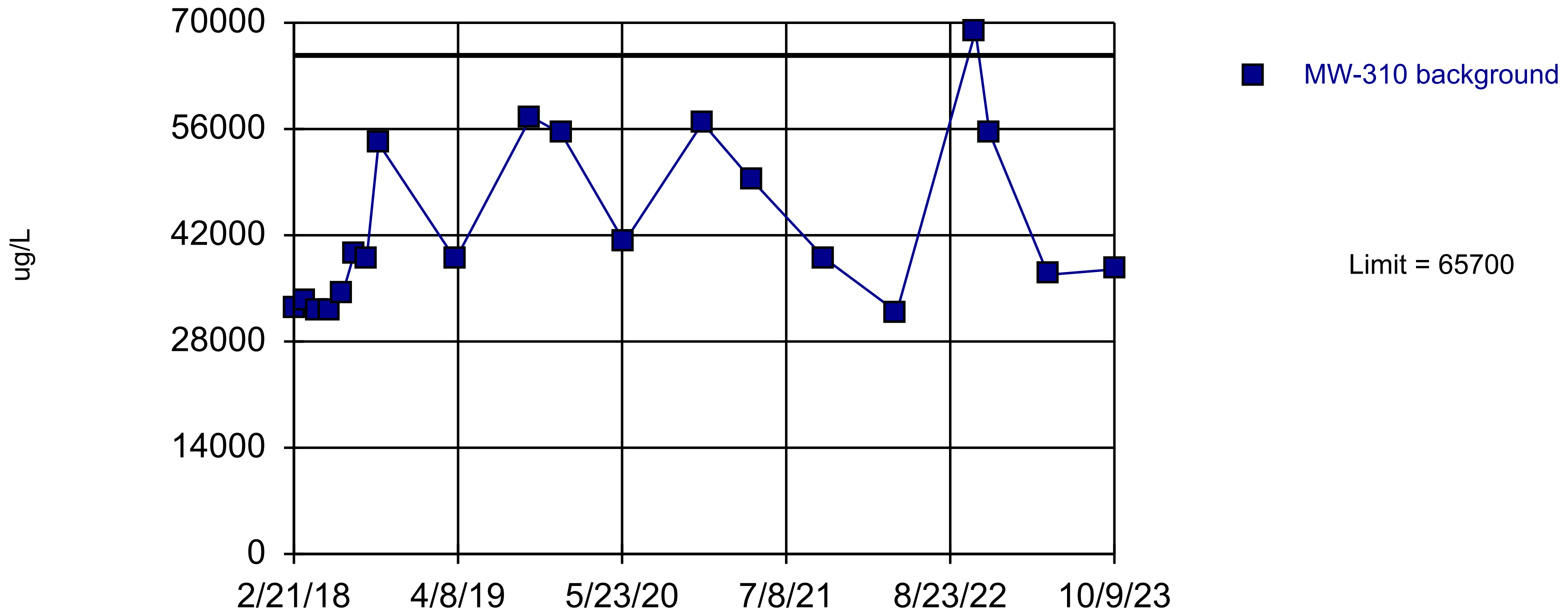
Constituent: Calcium (ug/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	42700
3/23/2018	41800
4/23/2018	39600
5/24/2018	52700
6/23/2018	67600
7/23/2018	63800
8/22/2018	93600
9/21/2018	55200
4/2/2019	45300
10/8/2019	46900
5/29/2020	51600
10/8/2020	65300
4/13/2021	62300
10/14/2021	83100
4/12/2022	80200
10/26/2022	162000
11/30/2022	153000
4/26/2023	35500
10/9/2023	66800

Calcium

Intrawell Parametric, MW-310



Background Data Summary (based on natural log transformation): Mean=10.65, Std. Dev.=0.2421, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8876, critical = 0.868. Kappa = 1.846 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

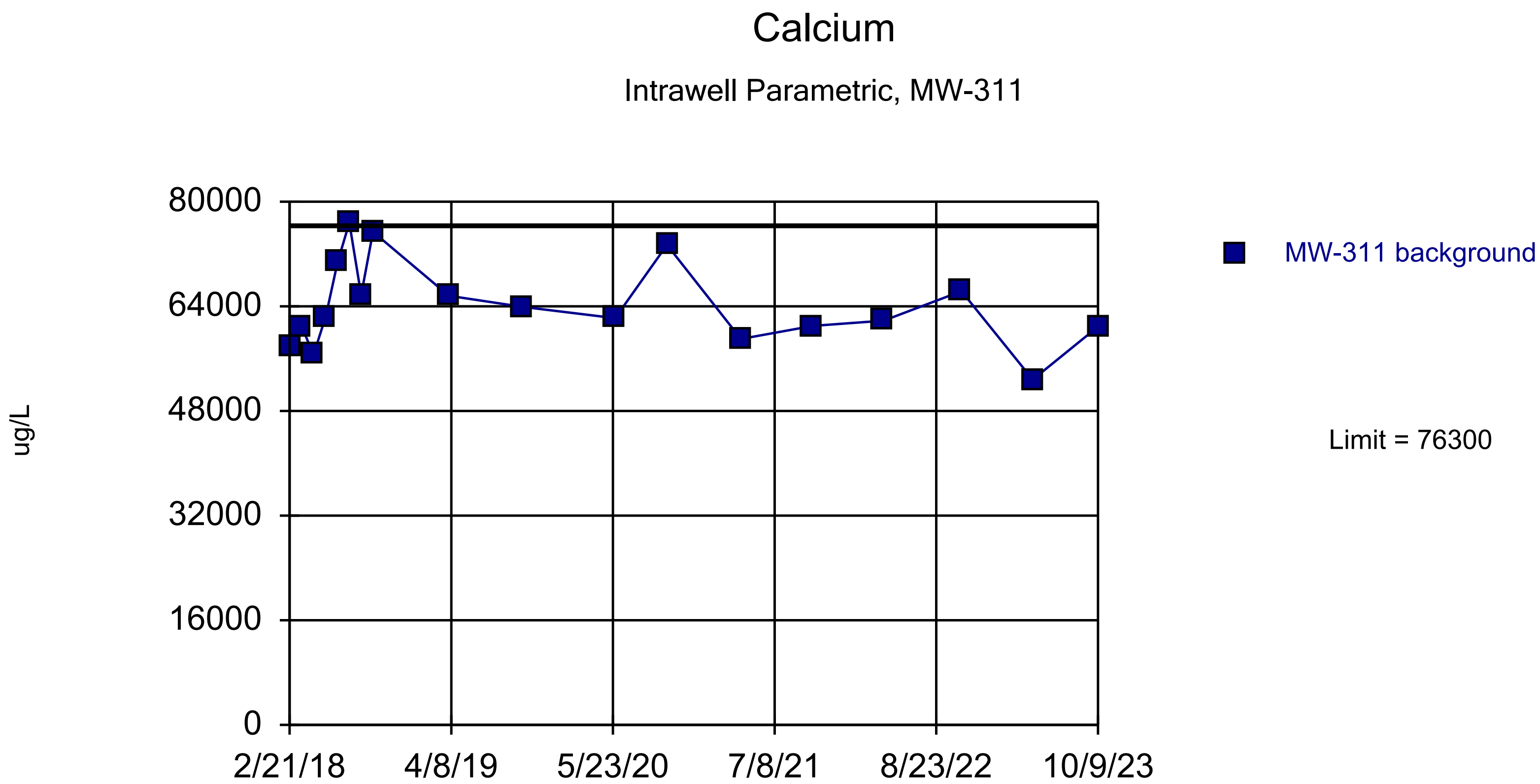
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	32400
3/23/2018	33400
4/23/2018	32100
5/24/2018	32100
6/23/2018	34300
7/23/2018	39700
8/22/2018	38800
9/21/2018	54100
4/2/2019	38800
10/8/2019	57600
12/23/2019	55400
5/29/2020	41100
12/11/2020	56800 (R)
4/13/2021	49300
10/14/2021	38900
4/12/2022	31900
10/26/2022	68900
11/30/2022	55500
4/26/2023	36800
10/9/2023	37500



Background Data Summary: Mean=64089, Std. Dev.=6493, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9474, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

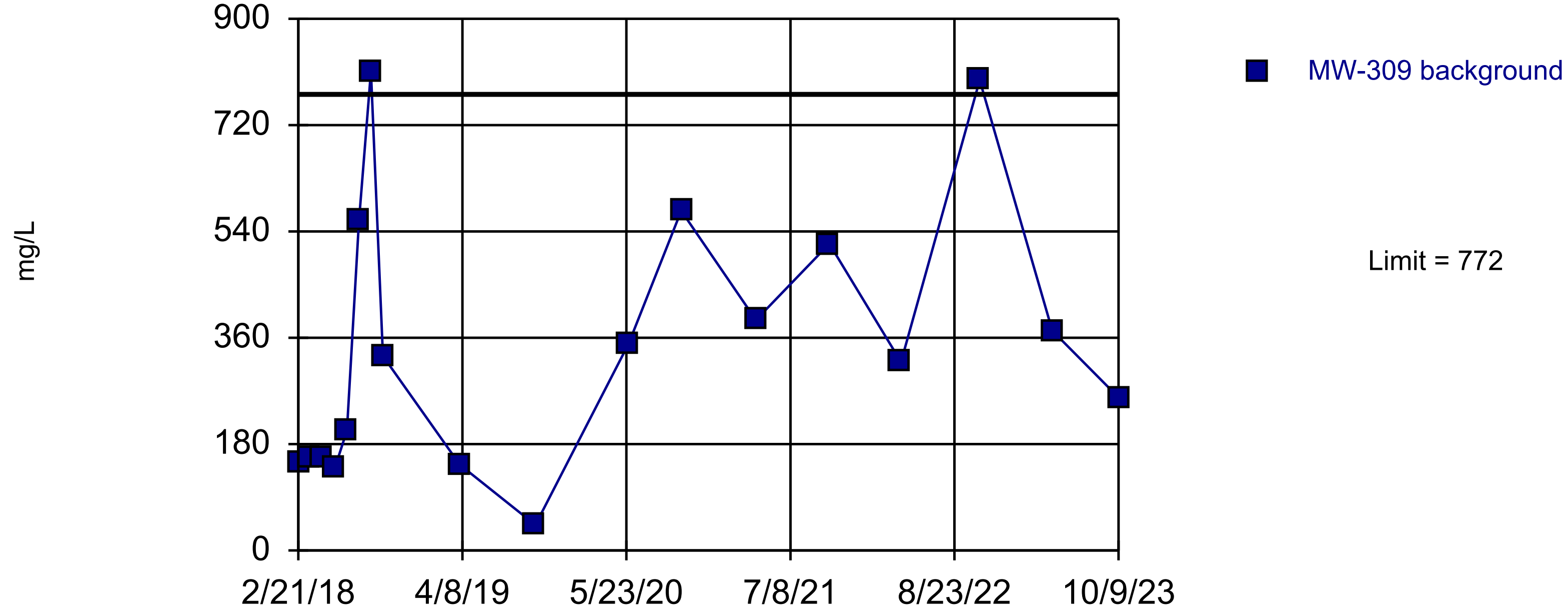
Constituent: Calcium (ug/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	58000
3/23/2018	61000
4/23/2018	56600
5/24/2018	62500
6/23/2018	70700
7/23/2018	76800
8/22/2018	65700
9/21/2018	75400
4/2/2019	65600
10/8/2019	63900
5/29/2020	62200
10/8/2020	73400
4/14/2021	59000
10/14/2021	61000
4/12/2022	61800
10/27/2022	66300
4/26/2023	52800
10/9/2023	60900

Chloride

Intrawell Parametric, MW-309



Background Data Summary: Mean=348.3, Std. Dev.=225.2, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9088, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

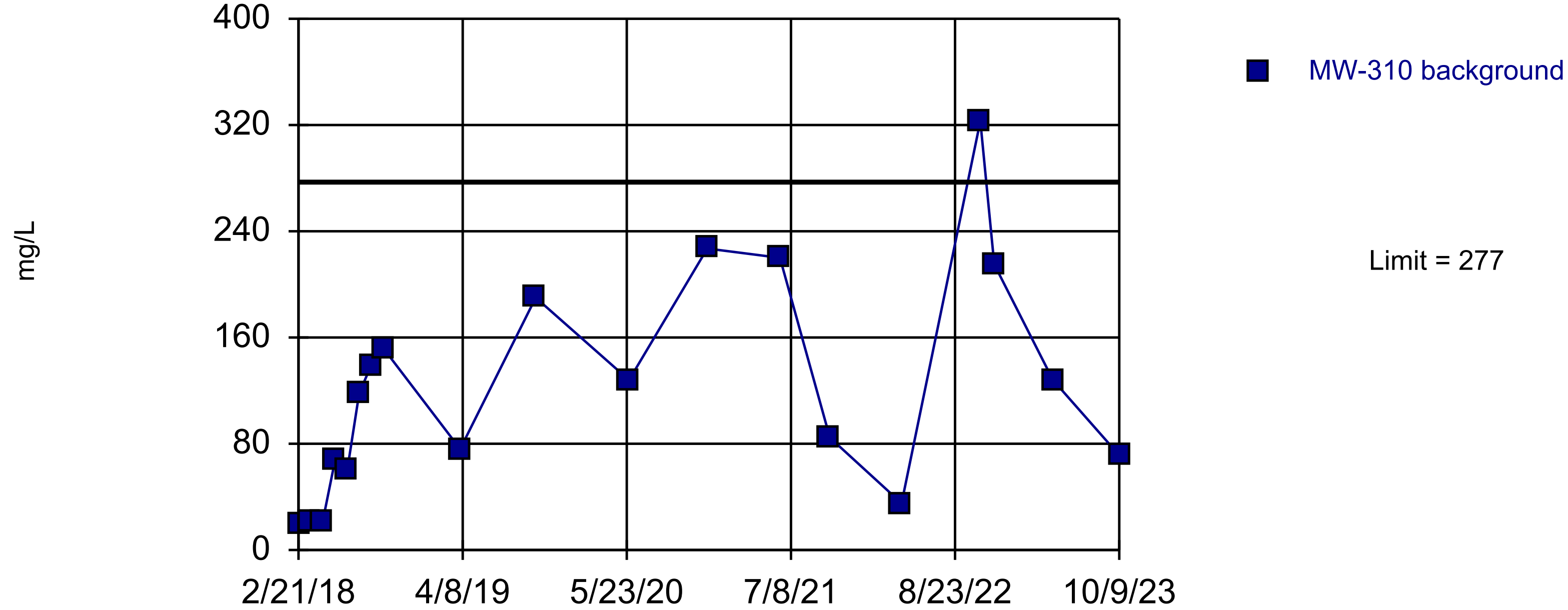
Constituent: Chloride (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	147
3/23/2018	157
4/23/2018	157
5/24/2018	141
6/23/2018	203
7/23/2018	557
8/22/2018	811
9/21/2018	329
4/2/2019	145
10/8/2019	43.2
5/29/2020	350
10/8/2020	575
4/13/2021	390
10/14/2021	519
4/12/2022	319
10/26/2022	796
4/26/2023	372
10/9/2023	259

Chloride

Intrawell Parametric, MW-310



Background Data Summary: Mean=121, Std. Dev.=83.79, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9287, critical = 0.863. Kappa = 1.865 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

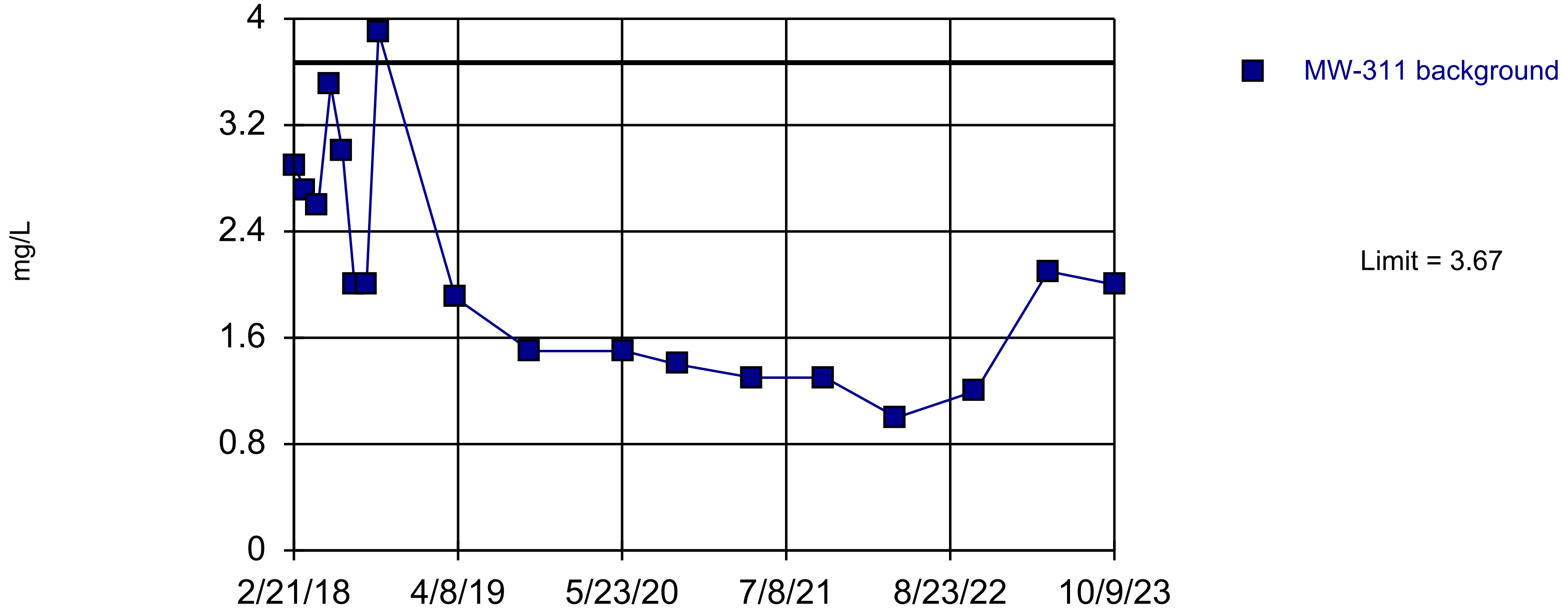
Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	19.8
3/23/2018	21.7
4/23/2018	22.1
5/24/2018	68.6
6/23/2018	59.8
7/23/2018	118
8/22/2018	139
9/21/2018	152
4/2/2019	76
10/8/2019	190
5/29/2020	128
12/11/2020	227 (R)
6/11/2021	220 (R)
10/14/2021	84.6
4/12/2022	35.2
10/26/2022	323
11/30/2022	215
4/26/2023	128
10/9/2023	71.3

Chloride

Intrawell Parametric, MW-311



Background Data Summary: Mean=2.1, Std. Dev.=0.8345, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9291, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Chloride (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	2.9
3/23/2018	2.7
4/23/2018	2.6
5/24/2018	3.5
6/23/2018	3
7/23/2018	2 (J)
8/22/2018	2 (J)
9/21/2018	3.9
4/2/2019	1.9 (J)
10/8/2019	1.5 (J)
5/29/2020	1.5 (J)
10/8/2020	1.4 (J)
4/14/2021	1.3 (J)
10/14/2021	1.3 (J)
4/12/2022	1 (J)
10/27/2022	1.2 (J)
4/26/2023	2.1
10/9/2023	2 (J)

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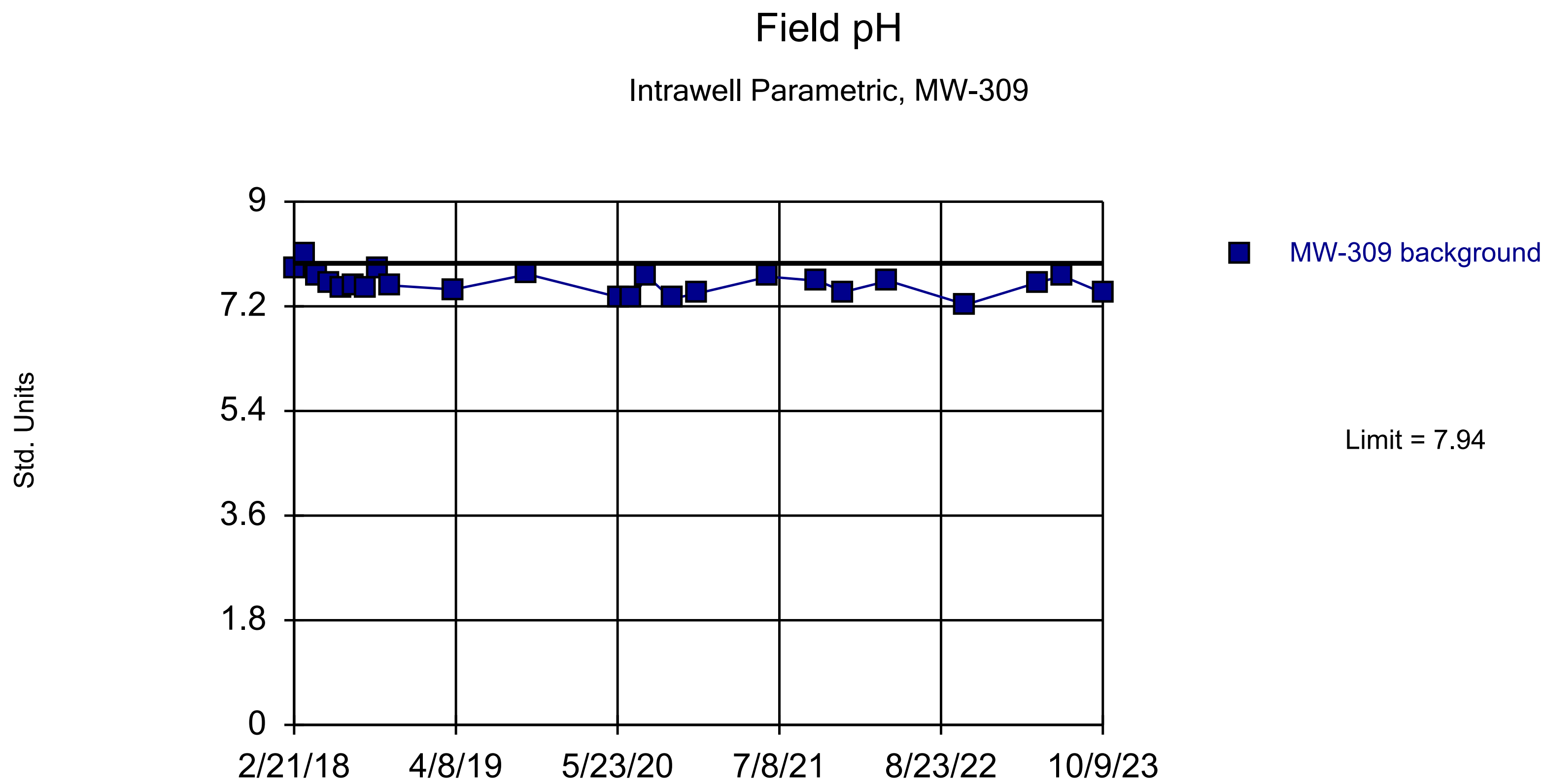


Background Data Summary: Mean=7.584, Std. Dev.=0.1949, n=24. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9787, critical = 0.884. Kappa = 1.803 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

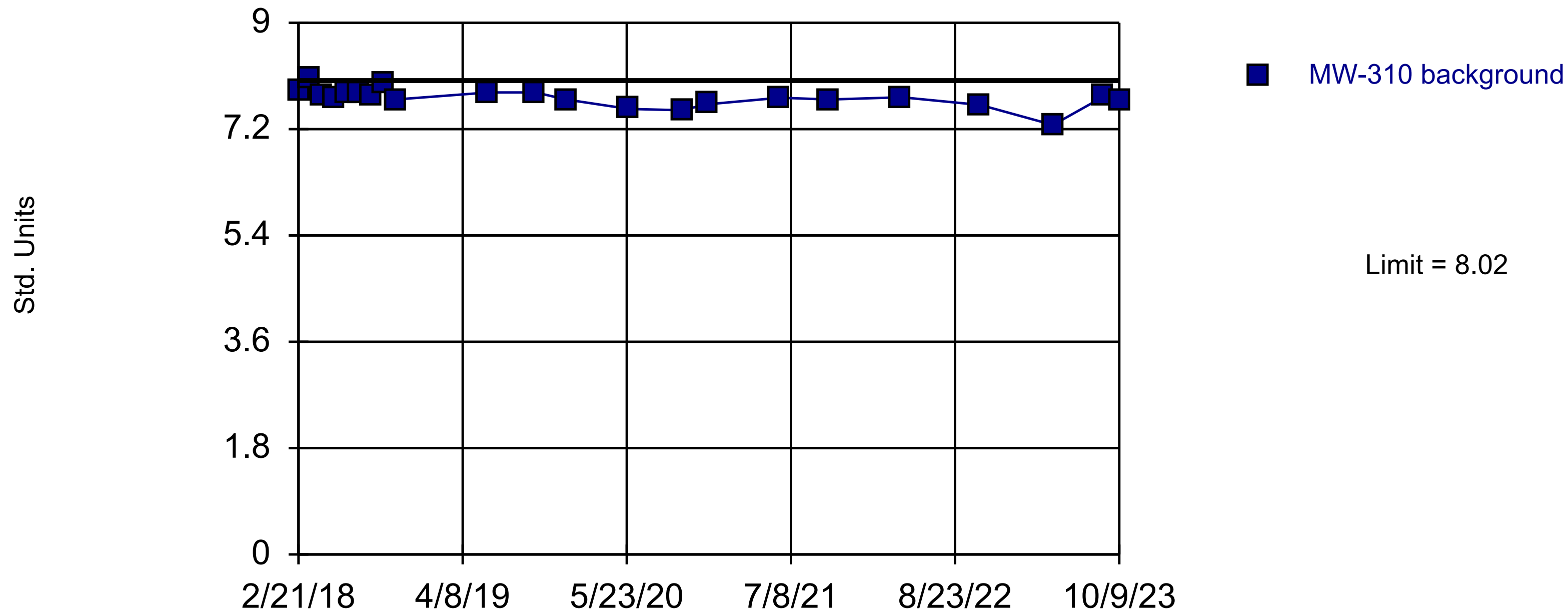
Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	7.84
3/23/2018	8.08
4/23/2018	7.71
5/24/2018	7.59
6/23/2018	7.5
7/23/2018	7.55
8/22/2018	7.53
9/21/2018	7.83
10/22/2018	7.56
4/2/2019	7.49
10/8/2019	7.75
5/29/2020	7.35
6/30/2020	7.33
8/6/2020	7.72
10/8/2020	7.33
12/11/2020	7.42
6/11/2021	7.71 (R)
10/14/2021	7.64
12/21/2021	7.45
4/12/2022	7.64
10/26/2022	7.23
4/26/2023	7.61
6/29/2023	7.72
10/9/2023	7.43

Field pH

Intrawell Parametric, MW-310



Background Data Summary: Mean=7.727, Std. Dev.=0.1605, n=22. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9254, critical = 0.878. Kappa = 1.824 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

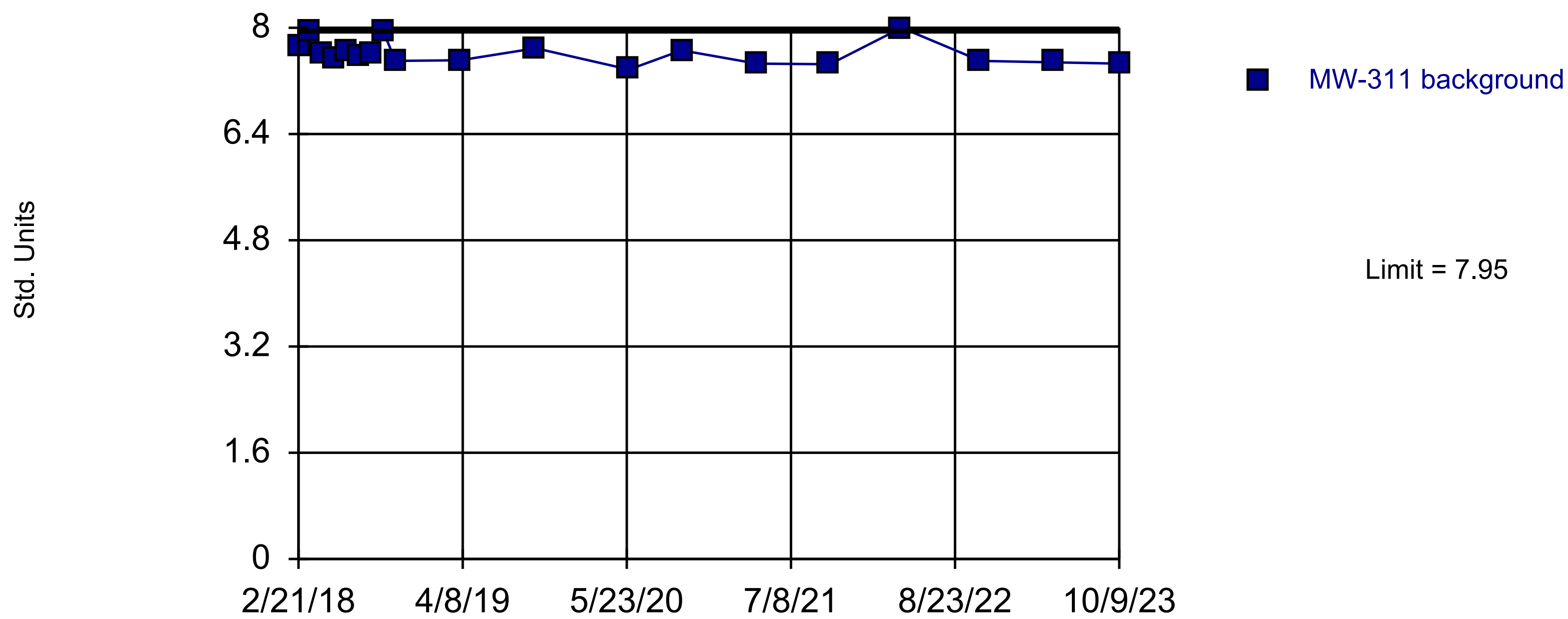
Constituent: Field pH (Std. Units) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	7.85
3/23/2018	8.06
4/23/2018	7.75
5/24/2018	7.74
6/23/2018	7.82
7/23/2018	7.81
8/22/2018	7.77
9/21/2018	7.98
10/22/2018	7.7
4/2/2019	9.79 (X)
6/12/2019	7.82
10/8/2019	7.82
12/23/2019	7.7
5/29/2020	7.54
10/8/2020	7.52
12/11/2020	7.62
6/11/2021	7.73 (R)
10/14/2021	7.7
4/12/2022	7.74
10/26/2022	7.61
4/26/2023	7.27
8/31/2023	7.75
10/9/2023	7.7

Field pH

Intrawell Parametric, MW-311



Background Data Summary: Mean=7.615, Std. Dev.=0.1791, n=19. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8877, critical = 0.863. Kappa = 1.865 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

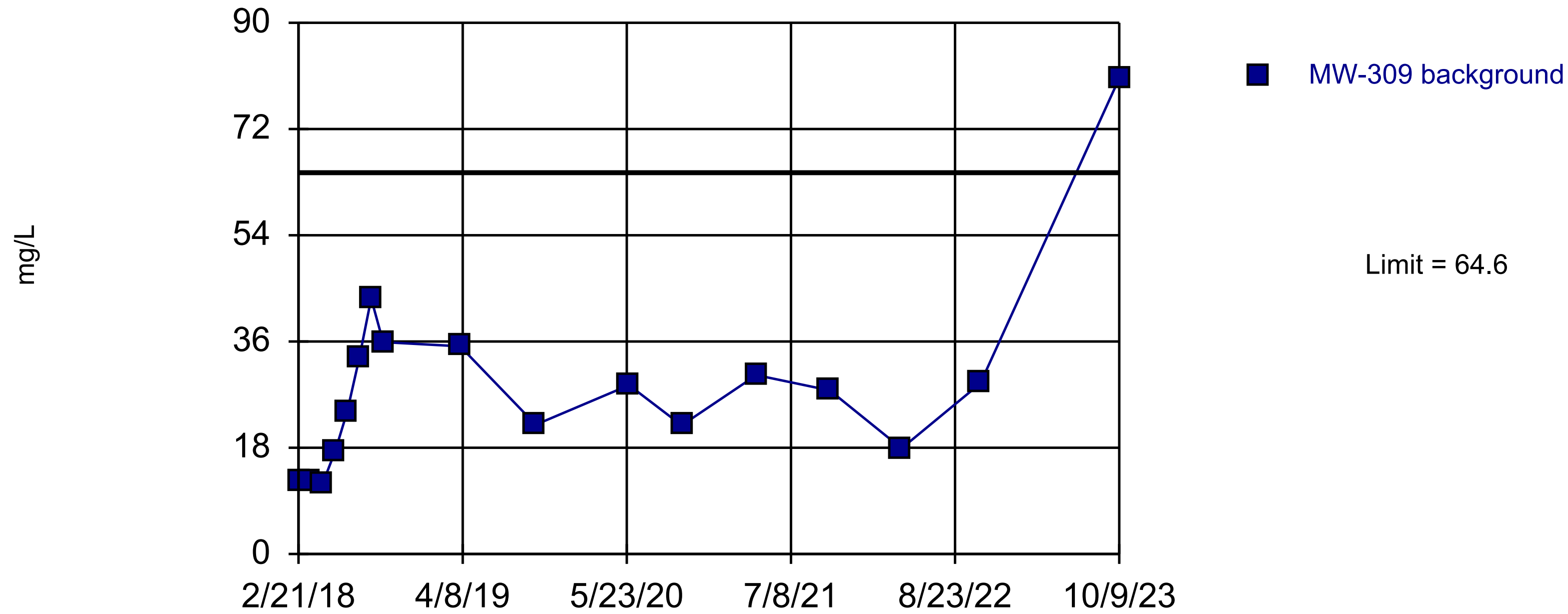
Constituent: Field pH (Std. Units) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	7.72
3/23/2018	7.93
4/23/2018	7.62
5/24/2018	7.54
6/23/2018	7.65
7/23/2018	7.59
8/22/2018	7.6
9/21/2018	7.95
10/22/2018	7.5
4/2/2019	7.51
10/8/2019	7.69
5/29/2020	7.37
10/8/2020	7.66
4/14/2021	7.46
10/14/2021	7.45
4/12/2022	8
10/27/2022	7.5
4/26/2023	7.48
10/9/2023	7.46

Sulfate

Intrawell Parametric, MW-309



Background Data Summary (based on natural log transformation): Mean=3.226, Std. Dev.=0.4956, n=17. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9483, critical = 0.851. Kappa = 1.902 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	12.2
3/23/2018	12.2
4/23/2018	12
5/24/2018	17.5
6/23/2018	24.1
7/23/2018	33.1
8/22/2018	43.3
9/21/2018	35.9
4/2/2019	35.2
10/8/2019	21.9
5/29/2020	28.6
10/8/2020	21.8
4/13/2021	30.3
10/14/2021	27.7
4/12/2022	17.9
10/26/2022	28.9
4/26/2023	143 (X)
6/29/2023	147 (X)
10/9/2023	80.6

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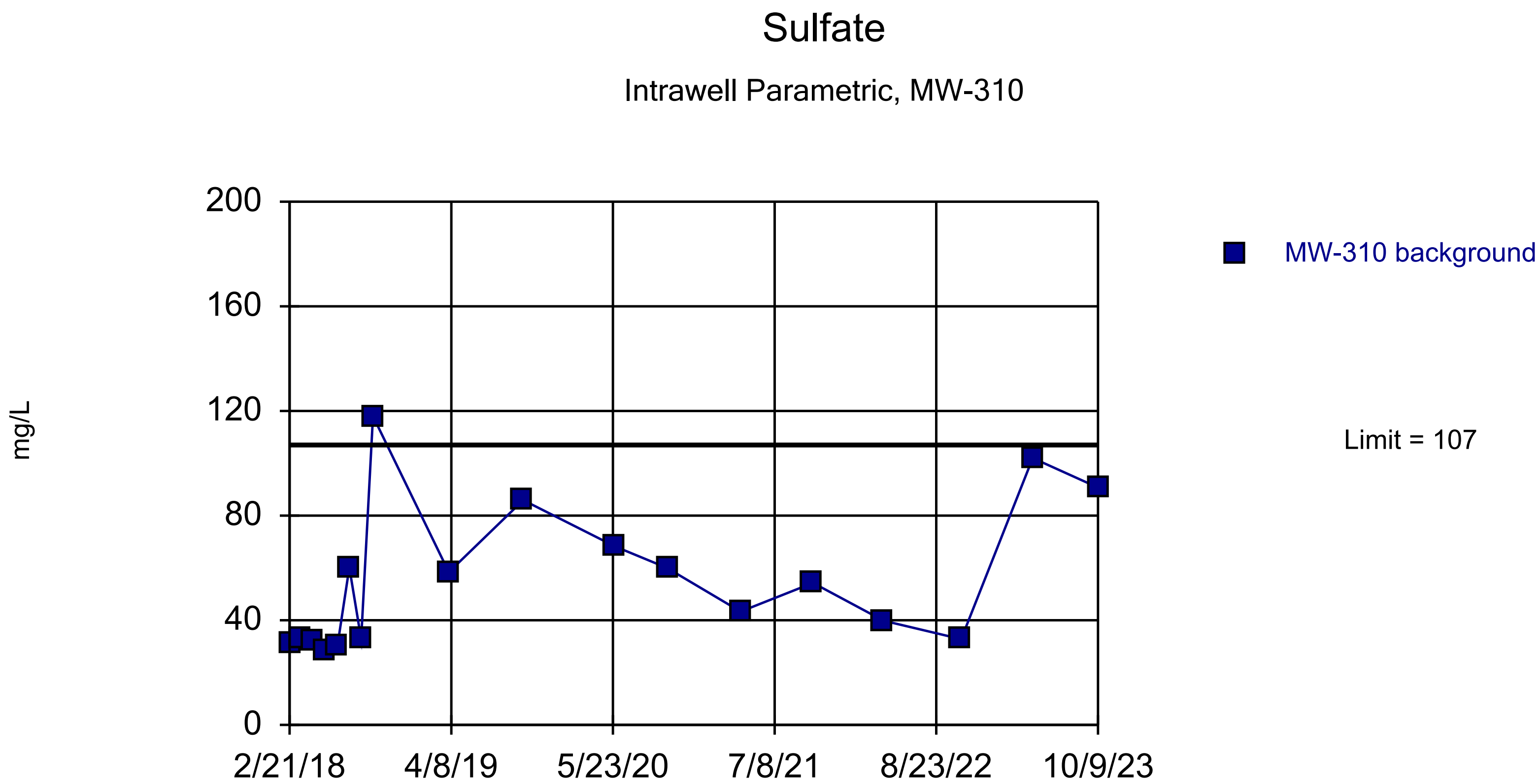


Background Data Summary: Mean=55.64, Std. Dev.=27.53, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8645, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit   Analysis Run 9/3/2024 6:55 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

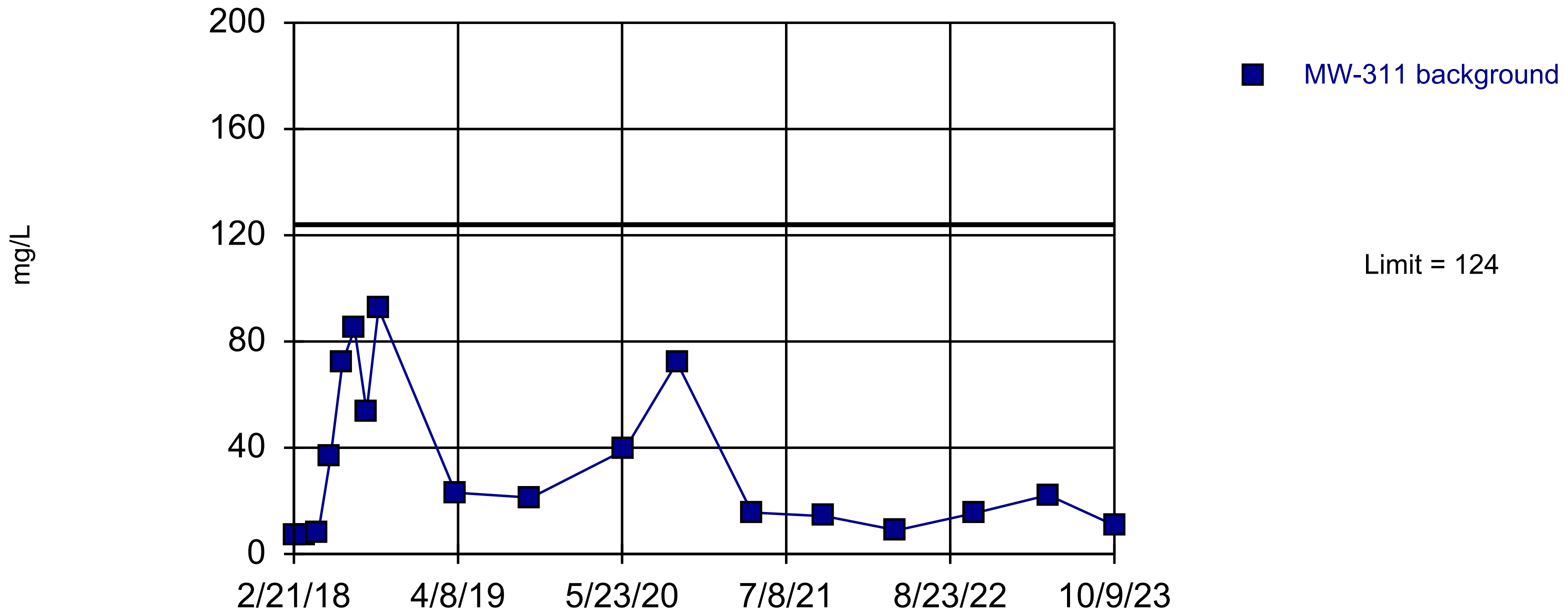
Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 9/3/2024 6:56 PM View: COL MOD 4-6
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	31.6
3/23/2018	33.1
4/23/2018	32
5/24/2018	28
6/23/2018	30.4
7/23/2018	60.2
8/22/2018	32.8
9/21/2018	118
4/2/2019	58.4
10/8/2019	85.9
5/29/2020	68.2
10/8/2020	60
4/13/2021	43.3
10/14/2021	54.3
4/12/2022	39.8
10/26/2022	32.8
4/26/2023	102
10/9/2023	90.7

Sulfate

Intrawell Parametric, MW-311



Background Data Summary (based on natural log transformation): Mean=3.155, Std. Dev.=0.8864, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9241, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Sulfate (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	7.1
3/23/2018	7.2
4/23/2018	7.9
5/24/2018	36.9
6/23/2018	72.3
7/23/2018	84.7
8/22/2018	53.6
9/21/2018	92.4
4/2/2019	23.1
10/8/2019	21.2
5/29/2020	39.1
10/8/2020	72.1
4/14/2021	15.6
10/14/2021	14.2
4/12/2022	8.9
10/27/2022	15.5
4/26/2023	22.2
10/9/2023	10.8

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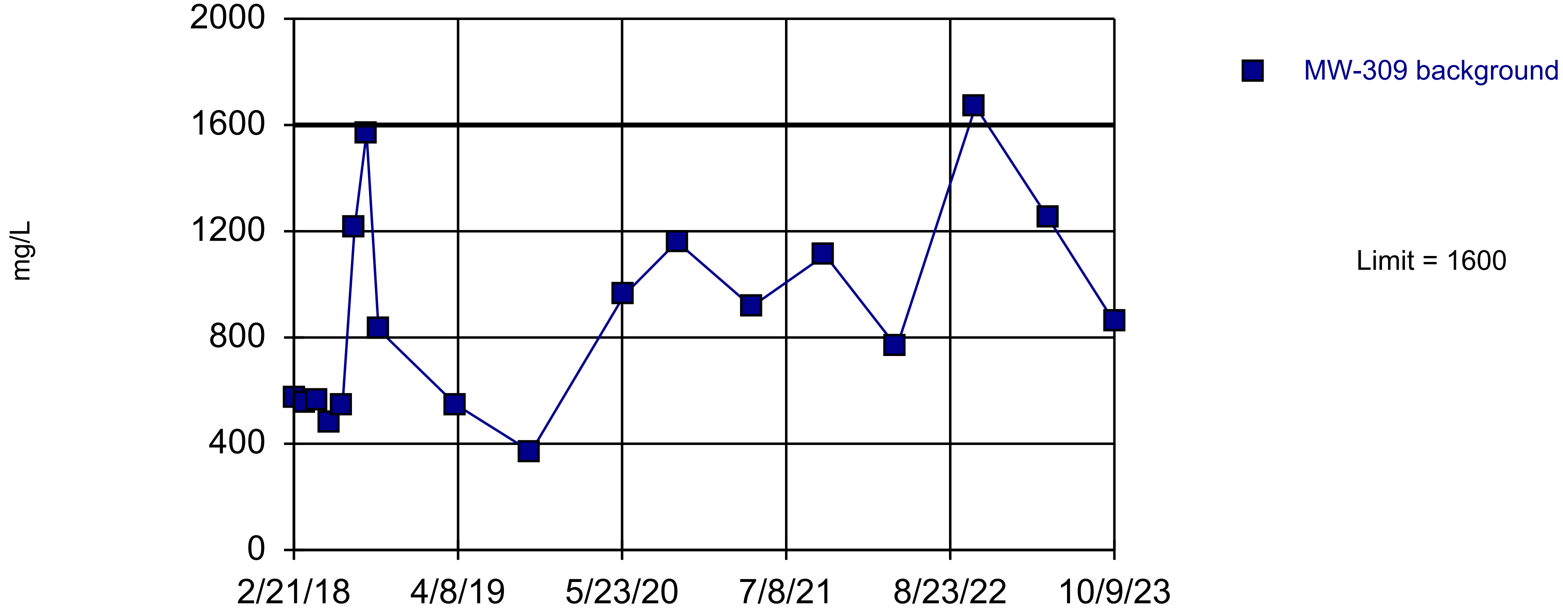
Total Dissolved Solids

Intrawell Parametric, MW-309



Background Data Summary: Mean=885.1, Std. Dev.=379.2, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.928, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Total Dissolved Solids (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-309
2/21/2018	576
3/23/2018	552
4/23/2018	562
5/24/2018	478
6/23/2018	548
7/23/2018	1210
8/22/2018	1570
9/21/2018	830
4/2/2019	548
10/8/2019	370
5/29/2020	960
10/8/2020	1160
4/13/2021	916
10/14/2021	1110
4/12/2022	764
10/26/2022	1670
4/26/2023	1250
10/9/2023	858

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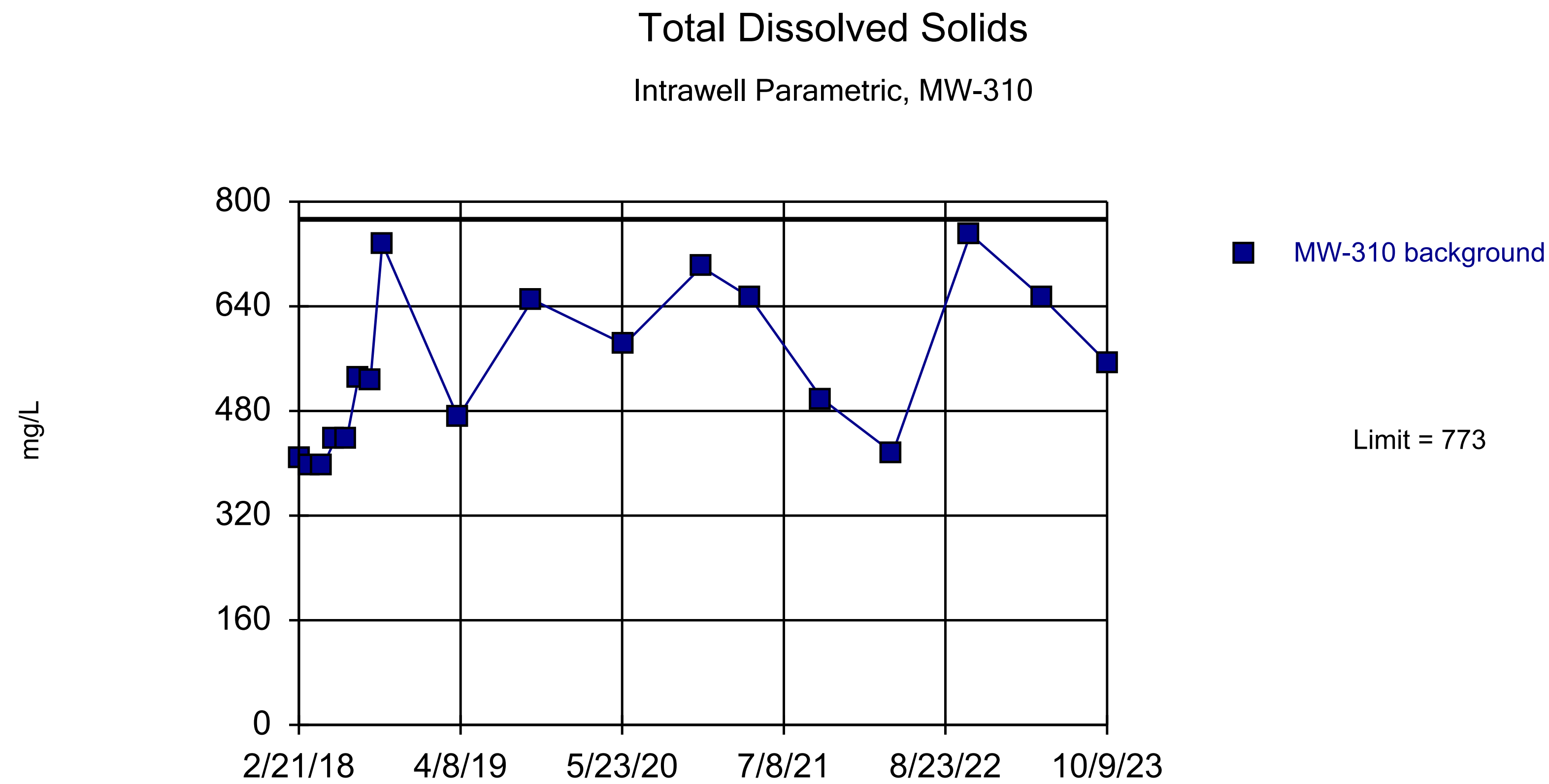


Background Data Summary: Mean=544.2, Std. Dev.=121.3, n=18. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9148, critical = 0.858. Kappa = 1.883 (c=6, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.002922. Assumes 1 future value.

Prediction Limit Analysis Run 9/3/2024 6:55 PM View: COL MOD 4-6

Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Prediction Limit

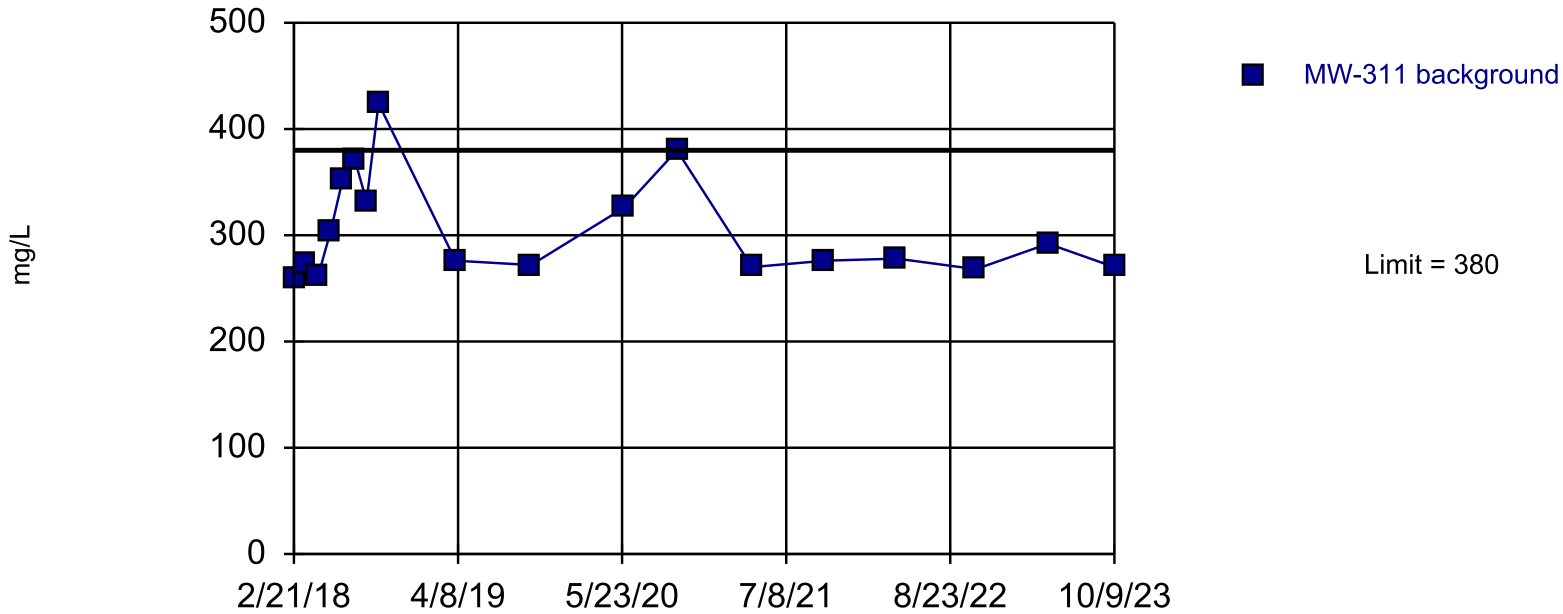
Constituent: Total Dissolved Solids (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-310
2/21/2018	406
3/23/2018	398
4/23/2018	396
5/24/2018	436
6/23/2018	438
7/23/2018	532
8/22/2018	526
9/21/2018	736
4/2/2019	470
10/8/2019	650
5/29/2020	582
12/11/2020	700 (R)
4/13/2021	654
10/14/2021	498
4/12/2022	416
10/26/2022	750
4/26/2023	654
10/9/2023	554

Total Dissolved Solids

Intrawell Non-parametric, MW-311



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is second highest of 18 background values. Well-constituent pair annual alpha = 0.03184. Individual comparison alpha = 0.01605 (1 of 2). Assumes 1 future value.

Prediction Limit   Analysis Run 9/3/2024 6:55 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

Prediction Limit

Constituent: Total Dissolved Solids (mg/L)   Analysis Run 9/3/2024 6:56 PM   View: COL MOD 4-6

Columbia Energy Center   Client: SCS Engineers   Data: December - Chem- export-Dec2020

	MW-311
2/21/2018	260
3/23/2018	274
4/23/2018	262
5/24/2018	304
6/23/2018	352
7/23/2018	372
8/22/2018	332
9/21/2018	424
4/2/2019	276
10/8/2019	272
5/29/2020	326
10/8/2020	380
4/14/2021	270
10/14/2021	276
4/12/2022	278
10/27/2022	268
4/26/2023	292
10/9/2023	270

Attachment 5

UPL Summary – Current and Previous

UPL Summary - COL Modules 4-6

Source	1/10/2020 Mod 4 Stats Memo						9/4/2024 Mod 4-6 Stats Memo					
Parameter Name	**UPL Method and Value (Intrawell)**						**UPL Method and Value (Intrawell)**					
Appendix III	**MW-309**		**MW-310**		**MW-311**		**MW-309**		**MW-310**		**MW-311**	
Boron, µg/L	P	42.2	P	81.9	P	49.8	P	61.9	P	82.4	P	43.1
Calcium, µg/L	P	99,900	P	56,000	P	84,200	P	137,000	P	65,700	P	76,300
Chloride, mg/L	P	901	P	205	P	4.41	P	772	P	277	P	3.67
Fluoride, mg/L	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ	DQ
Field pH, Std. Units	P	8.18	P	8.12	P	8.07	P	7.94	P	8.02	P	7.95
Sulfate, mg/L	P	53.1	NP	118	P	131	P	64.6	P	107	P	124
Total Dissolved Solids, mg/L	P	1730	P	759	P	462	P	1600	P	773	NP	380

Abbreviations:

UPL = Upper Prediction Limit
GPS = Groundwater Protection Standard
mg/L = milligrams per liter
µg/L = micrograms per liter
P = Parametric UPL with 1-of-2 retesting
NP = Nonparametric UPL (highest background value) with 1-of-2- retesting
DQ = Double Quantification Rule (not detected in background)

Created by: MDB 5/9/2023
Last revision by: SCC Date: 9/3/2024
Checked by: RM Date: 9/4/2024

\\Mad-fs01\data\Projects\Client\Alliant\CCR Groundwater Reporting\UPL Calcs\COL\[UPL Summary_COL Mod 4-6.xlsx]Mod 4-6