



Alliant Energy
4902 North Biltmore Lane
P.O. Box 77007
Madison, WI 53707-1007

1-800-ALLIANT (800-255-4268)
alliantenergy.com

January 31, 2024

Submitted via electronic mail

Ms. Ann Bekta
Wisconsin Department of Natural Resources
2514 Morse Street
Janesville, WI 53545

**Subject: Annual CCR Landfill Report
Wisconsin Power and Light Company
Dry Ash Disposal Facility (WDNR License #3025)
Columbia Energy Center
Portage, WI**

Dear Ms. Bekta,

On behalf of Wisconsin Power and Light Company (WPL), Alliant Energy is submitting this Annual CCR Landfill Report in accordance with NR 506.20(3). The annual report consists of the following required documents:

- Annual CCR Fugitive Dust Control Report
- Annual Inspection Report [NR 506.20(2)(b)]
- Annual Groundwater Monitoring and Corrective Action Report [NR 507.15(3)(m)]
 - Modules 1-3
 - Modules 4-6
 - Modules 10-11
- Leachate Pipe Cleaning and Inspection Report [NR 506.07(5)(g)]

Please note that many of these items are also required by the federal Coal Combustion Residuals (CCR) Rule and have been prepared to satisfy federal requirements. Please call me if you have any questions or concerns regarding these documents and Wisconsin-specific requirements so we can continue to improve this report and future annual reports.

Thank you very much for your consideration of this initial submittal. If you have any questions or comments regarding this information, please call me at (608) 458-3853.

Regards,

A handwritten signature in black ink, appearing to be "S. M. ...", written over a light blue horizontal line.

Jeff Maxted
Manager – Environmental Services
Alliant Energy

CC: Tyler Sullivan – Wisconsin DNR
Eric Sandvig, Director of Operations – Columbia Energy Center
Brian Clepper, James Zumstein – Columbia Energy Center
Phil Gearing, Eric Nelson, Tom Karwoski – SCS Engineers

Annual CCR Fugitive Dust Control Report

Wisconsin Power and Light Company

Columbia Energy Center (COL)

Annual Coal Combustion Residuals (CCR) Fugitive Dust Control Report

November 17, 2023

This report applies to the following CCR units at this facility:

CCR Surface Impoundments

COL Primary Ash Pond

COL Secondary Ash Pond

CCR Landfill

COL Dry Ash Disposal Facility Modules 1-3 (Existing CCR Landfill)

COL Dry Ash Disposal Facility Modules 4-6 (New CCR Landfill)

COL Dry Ash Disposal Facility Modules 10-11 (New CCR Landfill)

Annual Coal Combustion Residuals (CCR) Fugitive Dust Control Report

November 17, 2023

Background

This report describes the actions taken to minimize fugitive CCR dust from CCR units at this facility, provides a record of citizen complaints received since the previous report, and summarizes any corrective actions taken to minimize CCR fugitive dust. This report has been developed in accordance with 40 CFR 257.80(c).

COL Dry Ash Disposal Facility Modules 10-11 (a new CCR landfill) opened in the summer of 2023. A dry ash handling system was commissioned in 2023, resulting in the permanent discontinuation of sluicing at the facility. Subsequently, closure of the COL Primary Ash Pond was initiated in 2023, and all CCR from the Primary Ash Pond was excavated.

Description of the Actions Taken to Control CCR Fugitive Dust

In accordance with the CCR Fugitive Dust Control Plan developed for this facility, the following measures were taken when needed to minimize CCR from becoming airborne:

- Establishing and enforcing a vehicle speed limit of 10 mph or less. Reduced speeds minimize fugitive dust generated from vehicle traffic.
- Storing fly ash in silos and/or buildings prior to transport. Enclosing CCR in silos and/or buildings minimizes exposure to conditions that could lead to airborne CCR.
- Wet-sluicing CCR to existing CCR surface impoundments. Moistened CCR is less likely to become airborne. Note that wet-sluicing of CCR to the Primary Pond was permanently discontinued in 2023 following commissioning of a new bottom ash handling system.
- Covering open-bodied vehicles that are transporting CCR as needed to minimize the generation of fugitive dust during transport of CCR.
- Minimizing fall distances when handling or transferring CCR. The use of telescoping chutes, best practices when handling CCR with end loaders, and other best management practices can be used to minimize the generation of fugitive dust.
- Promptly collecting CCR that is observed in vehicle loading/unloading areas to minimize the potential for CCR to become airborne.
- Applying water directly to CCR using a water truck or irrigation system. Moistened CCR is less likely to become airborne.
- Suspending CCR management activities, including placement of CCR, during excessively windy conditions to minimize CCR from becoming airborne.
- Placement of soil and/or vegetated cover to minimize exposure of CCR in inactive landfill areas to conditions that could lead to fugitive dust.

Record of Citizen Complaints

Citizen complaints pertaining to fugitive dust are managed in accordance with Alliant Corporate Policy ENV-107. Specifically, the complaint must be reported to Environmental Services (1) via phone call and (2) in writing by submitting a completed Environmental Incident Report to Environmental Services within 10 business days. Citizen complaints are tracked within the Alliant Environmental Management Information System (“ENVIANCE”).

There were no citizen complaints at this facility related to CCR fugitive dust during this reporting period.

Summary of Corrective Measures Taken

Corrective actions in response to citizen complaints were not required during this reporting period.

Periodic Review of CCR Fugitive Dust Control Plan

The CCR Fugitive Dust Control Plan is reviewed annually, and updated as necessary, in conjunction with preparation of the Annual CCR Fugitive Dust Control Report [40 CFR 257.80(c)]. During the periodic review, staff evaluate each measure for controlling fugitive dust to ensure that it is still appropriate for minimizing CCR from becoming airborne at the facility, verify that the procedures for conditioning CCR prior to landfilling and the procedure for logging complaints are sufficient, and evaluate other operations changes at the facility to determine whether additional dust control measures should be added.

- END -

Annual Inspection Report

Annual CCR Landfill Inspection, Modules 1-3, Modules 4-6, and Modules 10-11

Columbia Dry Ash Disposal Facility

Prepared for:

Wisconsin Power and Light Company
W8375 Murray Road
Pardeeville, Wisconsin 53954

SCS ENGINEERS

25223067.00 | December 19, 2023

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


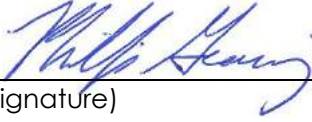
Table of Contents

Section	Page
PE Certification	iii
1.0 Introduction	1
1.1 Purpose.....	1
1.2 Background.....	1
2.0 Summary of Results and Recommendations	2
3.0 Annual Inspection	3
3.1 Operating Record Review.....	3
3.2 Visual Inspection	3
4.0 Inspection Results	4
4.1 Changes in Geometry.....	4
4.2 CCR Volumes	4
4.3 Appearance of Structural Weakness.....	5
4.3.1 Signs of Surface Movement or Instability	6
4.3.2 Inappropriate Vegetation Growth	6
4.3.3 Animal Burrows.....	6
4.3.4 Erosion Damage	6
4.3.5 Unusual Surface Damage Caused by Vehicle Traffic.....	7
4.4 Disruptive Conditions.....	7
4.4.1 Existing Disruptive Conditions	7
4.4.1.1 Current Inspection.....	7
4.4.1.2 Previous Inspection.....	7
4.4.2 Potentially Disruptive Conditions.....	7
4.4.2.1 Current Inspection.....	7
4.4.2.2 Previous Inspection.....	8
4.5 Other Changes Since Previous Annual Inspection	8
5.0 Future Inspections	8
5.1 Existing CCR Landfill.....	8
5.2 New CCR Landfills and Lateral Expansions	8

I:\25223067.00\Deliverables\2023 Federal CCR Inspection\231219_COL Annual CCR Landfill Inspection_FINAL.docx

[This page left blank intentionally]

PE CERTIFICATION

	<p>I, Phillip E. Gearing, hereby certify that this Annual CCR Landfill Inspection Report meets the requirements of 40 CFR 257.84(b)(2), was prepared by me or under my direct supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.</p>
	<p>12/19/2023</p>
<p>(signature)</p>	<p>(date)</p>
<p>Phillip Gearing (printed or typed name)</p>	
<p>License number <u> E-45115 </u></p> <p>My license renewal date is July 31, 2024.</p> <p>Pages or sheets covered by this seal:</p>	
<p>All – Annual CCR Landfill Inspection – Columbia Dry Ash Disposal Facility</p>	

[This page left blank intentionally]

1.0 INTRODUCTION

1.1 PURPOSE

On July 7, 2023, SCS Engineers (SCS) completed an annual inspection of the Wisconsin Power and Light Company (WPL) Columbia Dry Ash Disposal Facility (COL) in Pardeeville, Wisconsin. The annual inspection was completed in accordance with the U.S. Environmental Protection Agency (U.S. EPA) coal combustion residuals (CCR) rule, 40 Code of Federal Regulations (CFR) 257 Subpart D, in particular 257.84(b)(1). According to 40 CFR 257.84(b)(1), an annual inspection by a qualified professional engineer is required for all existing and new CCR landfills, and any lateral expansion of a CCR landfill. The purpose of the annual inspection is to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

- A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and
- A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

This report has been prepared in accordance with 40 CFR 257.84(b)(2) to document the annual inspection.

1.2 BACKGROUND

The COL facility includes an active CCR landfill, which currently consists of the following CCR units:

- Module 1 through Module 3 (existing CCR landfill per 40 CFR 257.53).
- Module 4 through Module 6, Module 10, and Module 11 (new CCR landfill per 40 CFR 257.53).

Modules 1 through 3 were previously described as separate existing CCR landfills, although they are contiguous and are managed as a single landfill by the facility and by the Wisconsin Department of Natural Resources. WPL previously clarified that Modules 1 through 3 are one existing CCR landfill under the federal CCR Rule, and this report reflects WPL's clarification. Modules 4, 5, 6, 10, and 11 are a new CCR landfill that initiated construction after October 19, 2015, and is therefore managed as a separate CCR unit under the CCR Rule, even though it is contiguous to Modules 1 through 3. Modules 10 and 11 were constructed in 2022 and 2023 and became operational in June 2023. Modules 7, 8, and 9 are permitted by the State of Wisconsin, but have not yet been developed.

The inspection requirements in 40 CFR 257.84(b)(1) apply to all of the CCR units listed above.

At the time of the inspection, the active CCR landfill units were in various stages of development or use, as described in the table below.

Disposal Phase	Unit	CCR Rule Status	Basis for Status
Phase 1	Modules 1 - 3	Existing CCR Landfill. Currently accepting CCR.	Final or interim grades have been reached. Final cover completed on portions of the CCR unit. Final closure per 257.102 will not be completed until final grades are reached throughout the CCR unit. Overlay from Module 4 and Module 10 was occurring onto Module 3.
Phase 1/ Phase 2	Modules 4 - 6, Module 10, and Module 11	New CCR Landfill. Currently accepting CCR.	CCR placement began on November 5, 2018 in the unit. CCR placement began in Modules 10 and 11 on June 1, 2023.

2.0 SUMMARY OF RESULTS AND RECOMMENDATIONS

SCS identified no deficiencies or releases during the annual inspection of the CCR units at COL. Deficiencies and releases must be remedied by the owner or operator as soon as feasible and the remedy documented.

SCS did identify additional conditions during the annual inspection that are not considered deficiencies but have the potential to become a deficiency if left unaddressed. Each condition and the recommendations provided by SCS to address them are summarized in the table below. These conditions and recommendations are described in further detail in **Section 4.0**.

Condition	CCR Unit / Area	Recommendation(s)	Report Section
Vegetation growth in down chutes, which could eventually affect final cover.	Grouted Down Chutes (Module 1 Final Cover)	Remove vegetation. Continue to observe and remove existing / future vegetation, as necessary. Monitor during 7-day inspections.	4.3.2
Vegetation growth near inlets and outlets. Vegetation directly adjacent to inlets and outlets was removed by hand during inspection.	Contact water culverts (Module 2)	Remove vegetation. Continue to observe and remove vegetation, as necessary. Monitor during 7-day inspections.	4.3.2
Woody vegetation growth in riprap, which may affect riprap stabilization and liner system if allowed to continue to grow.	West Riprap Slope (Contact Water/ Leachate Pond)	Remove woody growth or other unwanted vegetation in riprap. Continue to observe and remove vegetation, as necessary. Monitor during 7-day inspections.	4.3.2

Condition	CCR Unit / Area	Recommendation(s)	Report Section
Bare areas and rill erosion observed. Future erosion may eventually expose CCR if left un-vegetated.	Intermediate Cover (Modules 3 through 6)	Backfill and grade eroded areas. Add seed and erosion mat to bare areas to promote vegetation growth on intermediate cover. Monitor during 7-day inspections.	4.3.4
Tracking of CCR onto haul road.	West Haul Road Entrance and Access Road	Remove tracked material from haul roads per the fugitive dust plan. Add rock tracking areas for separation from landfill and haul road. Monitor during 7-day inspections.	4.4.2.1

3.0 ANNUAL INSPECTION

Mr. Phillip Gearing of SCS completed an annual inspection of active CCR landfill areas at COL, including Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 on July 7, 2023. Mr. Gearing is a licensed professional engineer in Wisconsin and holds a Bachelor of Science degree in Geological Engineering. He has over 17 years of experience in the design, construction, and operation of solid waste disposal facilities. The scope of the annual inspection is described in **Sections 3.1 and 3.2**. The results of the annual inspection are discussed in **Section 4.0**.

3.1 OPERATING RECORD REVIEW

SCS reviewed the available information in the operating record for COL. Information reviewed by SCS included operating record materials provided by WPL, and the information posted on Alliant Energy’s CCR Rule Compliance Data and Information website for the COL facility.

3.2 VISUAL INSPECTION

SCS completed a visual inspection of Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 to identify signs of distress or malfunction of the CCR units.

The visual inspection included observations of the following:

- CCR placement areas including active filling areas, intermediate cover areas, final cover areas, and exterior non-CCR berms or slopes.
- Leachate collection and removal system components including visible leachate drainage layer materials.
- Leachate and contact water run-off management features including internal contact water drainage features, leachate collection system discharge pipe, and the leachate/surface water pond.
- Non-contact storm water run-on and run-off control features including swales located adjacent to active fill areas, on intermediate/final cover slopes, and outside the landfill limits and the south sedimentation basin.

4.0 INSPECTION RESULTS

The results of the annual inspection, along with a description of any deficiencies or releases identified during the visual inspection, are summarized in the following sections.

4.1 CHANGES IN GEOMETRY

No apparent changes in geometry were noted that would indicate distress or malfunction of the CCR units at the facility since the previous annual inspection of Modules 1 through 3 and Modules 4 through 6 at the COL facility completed under 40 CFR 257.84(b)(1). Modules 10 and 11 were constructed since the previous annual inspection and all changes in geometry observed during the annual inspection were the result of planned CCR filling in the current CCR units.

As noted in **Section 1.2**, all CCR units are currently accepting CCR. A majority of the CCR placement is occurring in Modules 4 through 6, Module 10, and Module 11, but with overlay into Module 3. Final cover or intermediate cover is established along portions of Modules 1 through 3 and Modules 4 through 6. Vegetation is established or becoming established on all final and intermediate cover areas.

4.2 CCR VOLUMES

The approximate volume of CCR contained in each of the active units near the time of the inspection is summarized below. Note that the inspection was performed on July 7, 2023, and a survey of CCR was performed on July 25, 2023. A description of how the estimate was developed is summarized below.

Disposal Phase	Unit	Estimated Volume of CCR in Place	Basis for Estimate and Source
Phase 1	Modules 1-3	1,035,000 cubic yards	CCR volume is less than 2022 volume due to excavation of material from the unit for use in moisture conditioning of pond closure CCR in Modules 5 and 6. There was CCR overlay onto Modules 2 and 3 at the time of the inspection and the unit had yet to reach the previous 2022 inspection elevations. Estimated volume based on a survey performed on 7/25/2023 compared to documented base grades. Estimated volume excludes final cover or intermediate cover material installed at time of survey. Estimated volume considers a vertical boundary at the Module 3 limit to Module 4 and Module 10.
Phase 1/ Phase 2	Modules 4 - 6, Module 10, and Module 11	705,000 cubic yards	CCR continued to be placed in Modules 4 through 6, including overlays. CCR placement began in Modules 10 and 11 in June 2023. CCR volume placed in Modules 4, 5, 6, 10, and 11 was estimated based on a survey performed on 7/25/2023 compared to documented top of leachate drainage layer grades. Estimated volume considers a vertical boundary at the Module 4 limit to Module 3, Module 10 limit to Module 3, and Module 11 limit to Module 4.

4.3 APPEARANCE OF STRUCTURAL WEAKNESS

The inspection included a review of the appearance of an actual or potential structural weakness of the CCR unit. The visual inspection included a review of CCR fill areas including the top slopes, internal side slopes, external side slopes, and internal ramps/haul roads for the presence of the following conditions:

- Signs of surface movement or instability:
 - Sloughing, slumping, or sliding.
 - Surface cracking.
 - Slopes in excess of three horizontal to one vertical (3H:1V).
 - Toe of slope bench movement.
 - Evidence of inadequate compaction of exposed CCR.
- Inappropriate vegetation growth.

- Animal burrows.
- Erosion damage.
- Unusual surface damage caused by vehicle traffic.

4.3.1 Signs of Surface Movement or Instability

No signs of surface movement or instability were noted during the inspection.

4.3.2 Inappropriate Vegetation Growth

No inappropriate vegetation growth impacting the CCR unit was noted during the inspection. The following items have the potential to become a deficiency if left unaddressed:

- Vegetation was observed in the grouted riprap down chutes located on the Module 1 Final Cover. WPL should remove existing vegetation before it becomes established and impacts the final cover. Continued removal of future vegetation as necessary and monitoring during 7-day inspections is recommended.
- Vegetation growth was observed in the inlets and outlets of the Module 2 contact water culverts. During the annual inspection, vegetation directly adjacent to the inlets and outlets was cleared away by hand. Continued removal of future vegetation as necessary and monitoring during 7-day inspections is recommended.
- Vegetation was observed on the west riprap slope in the contact water/leachate pond. WPL should remove woody vegetation growth in the riprap before it becomes established and impacts the riprap stability or liner system. The vegetative growth was not impacting the stability of the CCR landfill at the time of the inspection. Continued vegetation removal from the riprap and monitoring during 7-day inspections is recommended.
- Vegetation made it difficult to observe the leachate outlet from Module 1. The location was staked so it could be located. Vegetation directly adjacent to the Module 1 outlet was cleared away during the annual inspection. No issues with the current operation of the outlet were observed. WPL should monitor vegetation during 7-day inspections and keep the area maintained to allow for the effective observation of flow from the pipe outlet.

4.3.3 Animal Burrows

No animal burrows were noted during the inspection.

4.3.4 Erosion Damage

The following erosion damage was noted during the inspection:

- Areas of bare soil were observed on the intermediate cover of Modules 3 through 6 (CCR Unit Modules 1 through 3 and Modules 4 through 6). Bare soil may erode eventually exposing CCR if not addressed. Bare soil areas should have seed and erosion mat or hydromulch added to promote vegetation growth on the intermediate cover. WPL should continue to monitor during 7-day inspections.

- Rill erosion was observed on the intermediate cover of Module 6 (CCR Unit Modules 4 through 6). Continued erosion may eventually expose CCR if not addressed. WPL should backfill, grade, seed, and erosion mat of hydromulch eroded areas to promote vegetation growth on the intermediate cover. WPL should continue to monitor during 7-day inspections.

The bare soil and erosion conditions noted are not currently considered an operating deficiency since it is unlikely to have a significant impact on the function of the CCR unit. However, WPL should continue to observe these areas during 7-day inspections to confirm that the conditions observed during the visual inspection, or similar future conditions, are addressed. No additional erosion damage was noted during the inspection. The erosion areas were discussed with plant staff after the inspection was performed.

4.3.5 Unusual Surface Damage Caused by Vehicle Traffic

No unusual surface damage caused by vehicle traffic was noted during the inspection.

4.4 DISRUPTIVE CONDITIONS

4.4.1 Existing Disruptive Conditions

4.4.1.1 Current Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the annual inspection.

4.4.1.2 Previous Inspection

No existing conditions that were disrupting the operation and safety of the CCR units were noted during the previous inspection.

4.4.2 Potentially Disruptive Conditions

4.4.2.1 Current Inspection

Tracking of CCR onto landfill haul road. The tracking of CCR onto the landfill west haul road was noted as a potentially disruptive condition. Tracking of CCR from Modules 4 through 6 was observed during the current inspection. The tracking and accumulation of CCR on the landfill entrance and access roads has the potential to produce fugitive dust if not addressed through maintenance of the roads as described in the fugitive dust control plan. WPL should remove CCR from the roads as indicated in the fugitive dust control plan on an as-needed basis.

The tracking and accumulation of CCR on the landfill haul roads is not currently considered an operating deficiency since WPL has maintained, and plans to continue maintaining, the haul roads as described in the fugitive dust control plan. The observed tracking and accumulation of CCR on the landfill haul roads can be addressed through regular housekeeping practices described in the fugitive dust control plan. WPL should maintain rock tracking areas as needed to create separation from active modules and the haul road. Monitoring of tracking and accumulation of CCR on the landfill haul road during 7-day inspections is recommended.

No other potentially disruptive conditions were noted during the inspection.

4.4.2.2 Previous Inspection

The tracking of CCR onto the landfill haul road was noted as a potentially disruptive condition. Tracking of CCR onto the landfill entrance and access roads was observed during the current inspection.

4.5 OTHER CHANGES SINCE PREVIOUS ANNUAL INSPECTION

No changes to site conditions that appear to have the potential to affect the stability or operation of the facility were noted during the inspection.

5.0 FUTURE INSPECTIONS

5.1 EXISTING CCR LANDFILL

As stated in 40 CFR 257.84(b)(4), the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the inspection report is the basis for establishing the deadline to complete the next subsequent inspection. Any required inspection may be conducted prior to the required deadline, provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. The owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record.

The next annual inspection of CCR units Modules 1 through 3, Modules 4 through 6, and Modules 10 and 11 must be completed within 1 year of the placement of this inspection report in the operating record for the COL facility.

5.2 NEW CCR LANDFILLS AND LATERAL EXPANSIONS

The initial annual inspection for modules constructed in the future must be completed within 14 months of the initial receipt of CCR in the module per 40 CFR 257.84(b)(4).

The current annual inspection covers the initial annual inspection for the lateral expansion of the CCR unit with the construction of Modules 10 and 11 completed in June 2023.

Annual Groundwater Monitoring and Corrective Action Reports

Modules 1-3

Modules 4-6

Modules 10-11

2023 Annual Groundwater Monitoring and Corrective Action Report

Columbia Energy Center
Dry Ash Disposal Facility, Modules 1 through 3
Pardeeville, Wisconsin

Prepared for:

Alliant Energy



SCS ENGINEERS

25223067.00 | January 31, 2024

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

OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Modules 1 through 3 2023 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) unit. The groundwater monitoring system for the Columbia Energy Center (COL) Dry Ash Disposal Facility Modules 1 through 3 monitors a single CCR unit. 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	<u>October 2022</u> Boron: MW-33AR, MW-34A, MW-302 Chloride: MW-33AR Sulfate: MW-33AR, MW-34A, MW-302 <u>April 2023</u> Boron: MW-33AR, MW-34A, MW-302 Chloride: MW-33AR Field pH: MW-34A Sulfate: MW-33AR, MW-34A
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2022 and April 2023 events during 2023. 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	
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

Table of Contents

Section	Page
Overview of Current Status.....	i
1.0 Introduction.....	1
2.0 Background.....	1
2.1 Geologic and Hydrogeologic Setting.....	1
2.1.1 Regional Information.....	1
2.1.2 Site Information.....	2
2.2 CCR Rule Monitoring System.....	2
3.0 §257.90(e) Annual Report Requirements.....	2
3.1 §257.90(e)(1) Site Map.....	3
3.2 §257.90(e)(2) Monitoring System Changes.....	3
3.3 §257.90(e)(3) Summary of Sampling Events.....	3
3.4 §257.90(e)(4) Monitoring Transition Narrative.....	4
3.5 §257.90(e)(5) Other Requirements.....	4
3.5.1 § 257.90(e) General Requirements.....	5
3.5.2 §257.94(d) Alternative Detection Monitoring Frequency.....	5
3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring.....	5
3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency.....	6
3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards.....	6
3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring..	6
3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment.....	6
3.6 §257.90(e)(6) Overview.....	6
4.0 References.....	7

Tables

Table 1.	Groundwater Monitoring Well Network
Table 2.	CCR Rule Groundwater Samples Summary
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network
Table 4.	Horizontal Gradients and Flow Velocity
Table 5.	Groundwater Analytical Results Summary
Table 6.	Groundwater Field Data Summary

Figures

Figure 1.	Site Location Map
Figure 2.	Site Plan and Monitoring Well Locations
Figure 3.	Water Table Map – April 2023
Figure 4.	Water Table Map – October 2023

Appendices

Appendix A	Regional Hydrogeologic Information
Appendix B	Boring Logs and Well Construction Documentation
Appendix C	Laboratory Reports
Appendix D	Historical Monitoring Results
Appendix E	Alternative Source Demonstrations
	E1 October 2022 Detection Monitoring
	E2 April 2023 Detection Monitoring

I:\25223067.00\Deliverables\2023 - Fed CCR Annual Report - COL Mod 1-3\240131_2023 Fed Annual Report - COL Mod 1-3_Final.docx

1.0 INTRODUCTION

This 2023 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 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units. The site location is shown on **Figure 1**.

This report covers the period of groundwater monitoring from January 1, 2023, through December 31, 2023.

The groundwater monitoring system for the Columbia Energy Center (COL) Dry Ash Disposal Facility Modules 1 through 3 monitors a single CCR unit:

- COL Dry Ash Disposal Facility – Modules 1-3 (existing CCR Landfill)

The system is designed to detect monitored constituents at the waste boundary of Modules 1 through 3 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 4 through 6 and Modules 10 and 11 of the COL Dry Ash Disposal Facility.

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 Modules 1 through 3. 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 Engineering, Inc., 1978). During drilling of CCR wells MW-301 and MW-302, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously installed monitoring wells MW-33AR, MW-34A, MW-84A, and M-4R show silty sand and sand as the primary unconsolidated materials at these locations. The boring logs for Ash Disposal Facility Modules 1 through 3 CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated sand unit.

Shallow groundwater at the site generally flows to the north and west across the existing landfill area. The April 2023 water levels and apparent flow directions reflect the influence of a temporary dewatering system installed to lower groundwater levels in the area of the Primary Pond as part of the closure project for that CCR Unit. The water table elevations and groundwater flow directions for the April 2023 monitoring event are shown on **Figure 3**, and the water table elevations and groundwater flow directions for the October 2023 monitoring event are shown on **Figure 4**. 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-302, MW-33AR, and MW-34A. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 29 to 43 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 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 Modules 1 through 3 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;

There were no monitoring system changes in 2023.

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;

Two semiannual groundwater sampling events were completed in 2023 at the COL Dry Ash Disposal Modules 1 through 3 as part of ongoing detection monitoring.

Groundwater samples collected during the semiannual events in April and October 2023 were analyzed for Appendix III constituents. 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 2022 monitoring event data was completed and transmitted to WPL on March 2, 2023. The validation and evaluation of the April 2023 monitoring event data was completed and transmitted to WPL on August 24, 2023. The validation and evaluation of the October 2023 monitoring event data was in progress at the end of 2023 and will be transmitted to WPL in 2024; therefore, the October 2023 monitoring results and analytical report will be included in the 2024 annual report. The October 2023 groundwater elevation data are included in this report.

The sampling results for Appendix III parameters in October 2022 and April 2023 are summarized in **Table 5**. Field parameter results for the October 2022 and April 2023 sampling events are provided in **Table 6**. The analytical laboratory reports for October 2022 and April 2023 are provided in **Appendix C**. Historical results for each monitoring well through April 2023 are summarized in **Appendix D**.

The October 2022 analyses for the samples collected from background wells MW-84 and MW-301 are provided in two laboratory reports: an initial report and a reanalysis report. The reanalysis only affects Appendix IV parameters, which are not required for the Mod 1-3 LF CCR Unit, but are required

for other CCR Units at COL. The background well samples were reanalyzed for select metals because the original results were flagged for detections in the method blank sample and/or were not consistent with historical results. The reanalysis was completed within the method holding time, the metals were not detected in the method blank, and no other flags were applied to the results. Based on the quality control review, the reanalysis results were considered to be more accurate than the original analyses.

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 2023. The COL Dry Ash Disposal Facility, Modules 1 through 3, remained in the detection monitoring program.

In 2023, the monitoring results for the October 2022 and April 2023 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 interwell upper prediction limits (UPLs) based on background monitoring results from the upgradient wells (MW-84A and MW-301). The interwell UPLs were most recently updated in January 2020 using background data collected through October 2019. The January 2020 statistical analysis was included as an appendix in the 2021 Annual Groundwater Monitoring Report. The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. Environmental Protection Agency [U.S. EPA], 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended. The next UPL update is planned for 2024.

For the October 2022 and April 2023 events, SSIs for boron, chloride, and sulfate were identified.

Alternative source demonstrations (ASDs) were completed for the October 2022 and April 2023 events, demonstrating that sources other than the CCR unit were the likely cause of the observed concentrations of boron, chloride, and 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 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

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 2023.

Summary of Key Actions Completed:

- Statistical evaluation and determination of SSIs for the October 2022 and April 2023 monitoring events.
- ASD reports for the SSIs identified from the October 2022 and April 2023 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2023).

Description of Any Problems Encountered: No problems were encountered for Mod 1-3 in 2023.

Discussion of Actions to Resolve the Problems: Not applicable.

Projection of Key Activities for the Upcoming Year (2024):

- Statistical evaluation and determination of any SSIs for the October 2023 and April 2024 monitoring events.
- If an SSI is determined, then within 90 days either:
 - Complete ASD (if applicable), or
 - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2024).

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 2022 and April 2023 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.

[This page left blank intentionally.]

Tables

- 1 Groundwater Monitoring Well Network
- 2 CCR Rule Groundwater Samples Summary
- 3 Groundwater Elevation – State Monitoring Program
and CCR Well Network
- 4 Horizontal Gradients and Flow Velocity
- 5 Groundwater Analytical Results Summary
- 6 Groundwater Field Data Summary

**Table 1. Groundwater Monitoring Well Network
Columbia Energy Center Dry Ash Disposal Facility - Modules 1-3
SCS Engineers Project #25223067.00**

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
MW-302	Downgradient	Compliance
MW-34A	Downgradient	Compliance
MW-33AR	Downgradient	Compliance

Note:

1, Monitoring well MW-1AR was abandoned in 2022 because it was within the footprint of the pending MOD 10-11 expansion area. The monitoring network certification was updated with the abandonment of MW-1AR in October 2022.

Created by: NDK
 Last revision by: NLB
 Checked by: BLR

Date: 9/19/2022
 Date: 11/29/2023
 Date: 12/1/2023

**Table 2. CCR Rule Groundwater Samples Summary
Columbia Energy Center Dry Ash Disposal Facility, Modules 1-3
SCS Engineers Project #25223067.00**

Sample Dates	Compliance Wells			Background Wells	
	MW-302	MW-34A	MW-33AR	MW-84A	MW-301
4/26-27/2023	D	D	D	D	D
10/11/2023	D	D	D	D	D
Total Samples	2	2	2	2	2

Abbreviations:

D = Required by Detection Monitoring Program

Created by: <u>NLB</u>	Date: <u>11/29/2023</u>
Last revision by: <u>NLB</u>	Date: <u>11/29/2023</u>
Checked by: <u>RM</u>	Date: <u>12/12/2023</u>

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
	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
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
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

Ash Pond Facility (Facility ID #02325)

**Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center Dry Ash Disposal Facility - Modules 1-3
SCS Engineers Project #25223067.00
January - December 2023**

Flow Path A - North					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
4/24-27/2023	787.00	786.00	611	0.0016	0.042

Flow Path A - Northwest					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
4/24-27/2023	787.00	786.00	815	0.0012	0.031
10/9-11/2023	785.00	783.00	1035	0.0019	0.049

Wells	K Values (cm/sec)	K Values (ft/d)
MW-34A	N/A	N/A
MW-302	3.22E-02	91.2
MW-33AR	4.01E-04	1.1
Geometric Mean	3.59E-03	10.2

Assumed Porosity, n
0.40

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

ft = feet

ft/d = feet per day

K = hydraulic conductivity

n = effective porosity

V = groundwater flow velocity

h1, h2 = point interpreted groundwater elevation at locations 1 and 2

Δl = distance between location 1 and 2

Δh/Δl = hydraulic gradient

Note:

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

Created by: RM
 Last revision by: RM
 Checked by: NLB

Date: 1/2/2024
 Date: 1/2/2024
 Date: 1/2/2024

Table 5. Groundwater Analytical Results Summary
Columbia Energy Center Dry Ash Disposal Facility - Modules 1-3 / SCS Engineers Project #25223067.00

Parameter Name	UPL Method	UPL	Background Wells				Compliance Wells					
			MW-84A		MW-301		MW-33AR		MW-34A		MW-302	
			10/27/2022	4/27/2023	10/17/2022	4/27/2023	10/27/2022	4/24/2023	10/27/2022	4/26/2023	10/27/2022	4/27/2023
Groundwater Elevation (ft above msl)			784.57	786.97	784.91	787.57	781.94	785.79	783.61	786.22	784.62	786.87
Appendix III												
Boron, ug/L	P	35.6	12.2	10.3	37.5	20.1	586	532	264	220	374	541
Calcium, ug/L	NP	129,000	78,400	68,600	62,800	P6 120,000	77,000	55,300	87,300	49,600	91,200	66,500
Chloride, mg/L	P	6.2	3.4	3.0	2.3	1.5	J 40.5	19.0	2.2	2.0	2.1	1.3
Fluoride, mg/L	DQ	DQ	<0.095	<0.095	<0.095	M0 <0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH, Std. Units	P	7.78	7.31	7.01	6.80	6.65	7.54	7.61	7.53	7.53	7.25	7.36
Sulfate, mg/L	P	30.3	1.1	J 1.3	J 11.6	12.3	153	104	169	48.4	30.3	36.6
Total Dissolved Solids, mg/L	NP	514	302	326	282	526	440	394	436	302	348	352

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

Abbreviations:

mg/L = milligrams per liter
 ug/L = micrograms per liter
 SSI = Statistically Significant Increase
 -- = Not Measured

GPS = Groundwater Protection Standard
 UPL = Upper Prediction Limit
 NP = Nonparametric UPL with 1-of-2 retesting
 P = Parametric UPL with 1-of-2 retesting

LOD = Limit of Detection
 LOQ = Limit of Quantitation
 DQ = Double Quantification

J = Estimated concentration at or above the LOD and below the LOQ.
 P6 = Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
 M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits

Notes:

1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background wells MW-84A and MW-301. Interwell UPLs based on 1-of-2 retesting approach. UPLs updated in January 2020 based on background well results through October 2019.
3. Interwell UPLs calculated based on results from background wells MW-84 and MW-301.

Created by:	<u>NDK</u>	Date:	<u>9/19/2022</u>
Last revision by:	<u>NLB</u>	Date:	<u>7/31/2023</u>
Checked by:	<u>BLR</u>	Date:	<u>8/2/2023</u>
Scientist/Proj Mgr QA/QC:	<u>TK</u>	Date:	<u>12/28/2023</u>

Table 6. Groundwater Field Data Summary
Columbia Energy Center Dry Ash Disposal Facility - Modules 1-3 / SCS Engineers Project #25223067.00

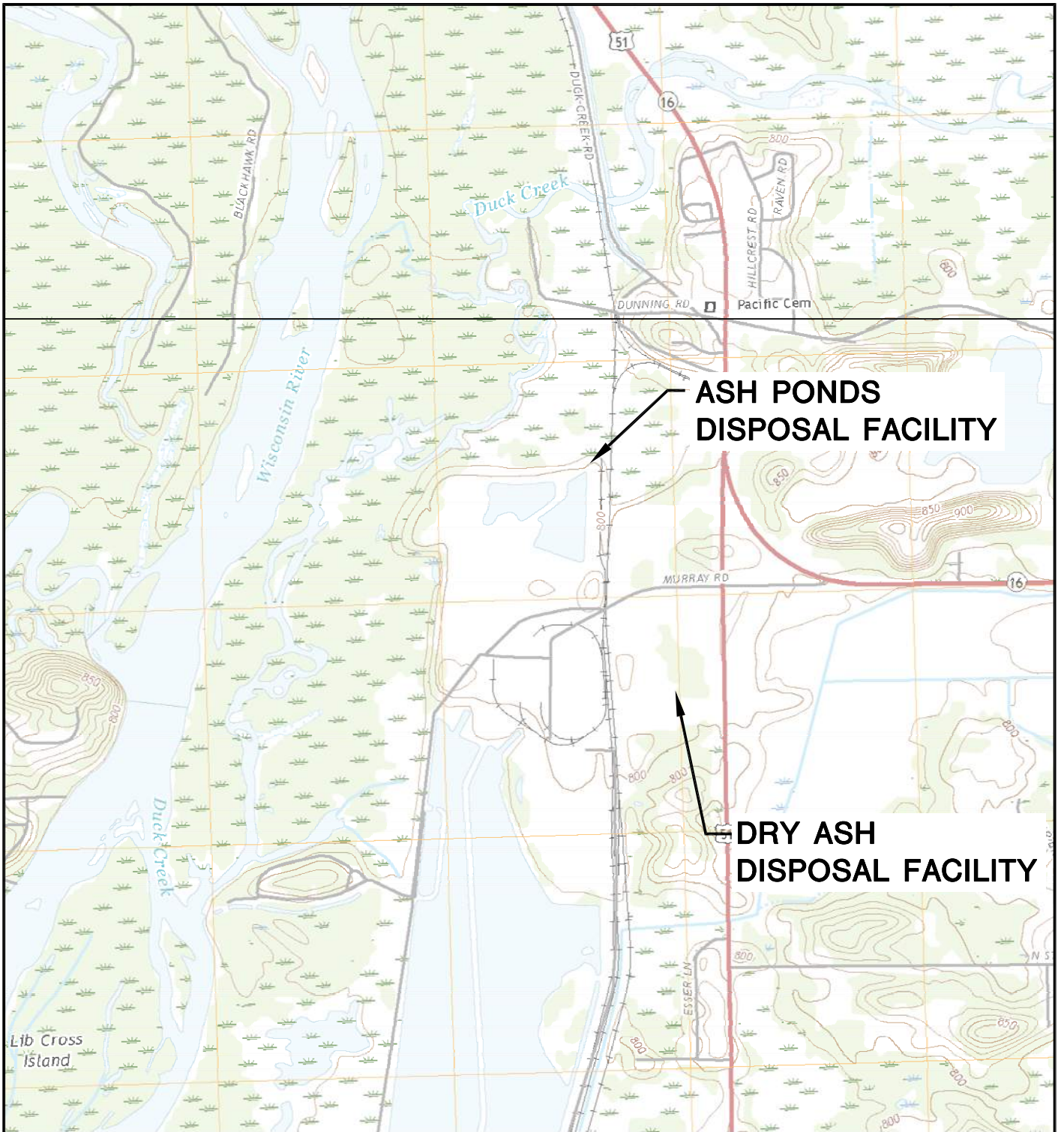
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-84A	10/27/2022	784.57	11.7	7.31	8.31	585	40	0.00
	4/27/2023	786.97	10.7	7.01	9.37	557	103	0.72
MW-301	10/27/2022	784.91	10.8	6.80	0.10	508	81	0.00
	4/27/2023	787.57	8.0	6.65	6.50	857	95	0.00
MW-302	10/27/2022	784.62	11.6	7.25	8.60	616	38	0.00
	4/27/2023	786.87	9.7	7.36	10.91	605	145	1.82
MW-33AR	10/27/2022	781.94	12.7	7.54	8.91	737	101	0.00
	4/27/2023	785.79	10.2	7.61	11.71	609	177	0.20
MW-34A	10/27/2022	783.61	12.6	7.53	8.46	648	39	1.76
	4/26/2023	786.22	10.9	7.53	9.87	466	124	2.11

Created by: RM
 Last revision by: BLR
 Checked by: RM

Date: 12/11/2023
 Date: 12/11/2023
 Date: 12/12/2023

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – April 2023
- 4 Water Table Map – October 2023

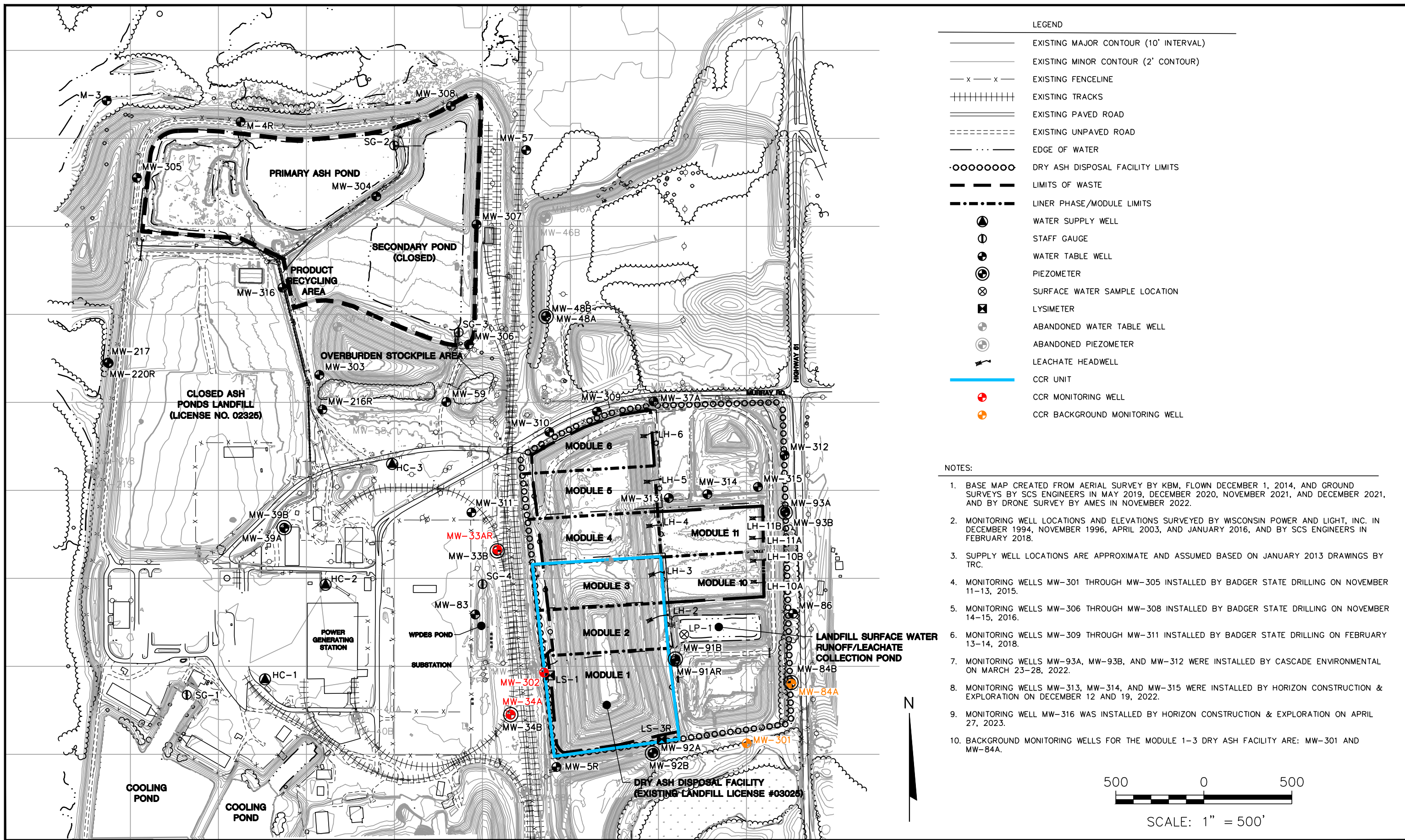


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25220067.00		DRAWN BY:	BSS		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					

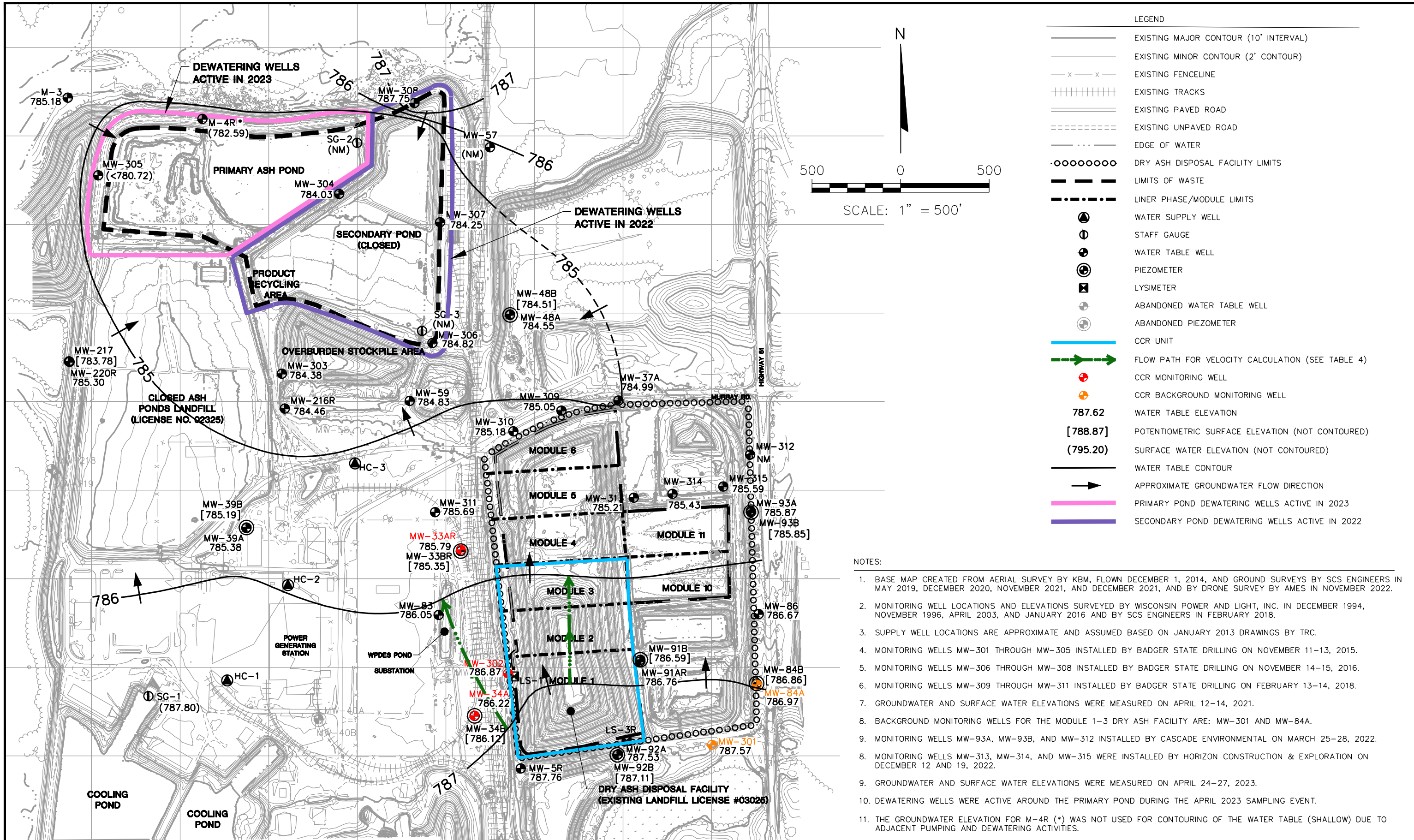
I:\25220067.00\Drawings\ASD Mod 1-3 LF\Site Location Map.dwg, 4/12/2020 7:05:09 PM



- LEGEND**
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - 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
- 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 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. BACKGROUND MONITORING WELLS FOR THE MODULE 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.

PROJECT NO. 25223067.00	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 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	FIGURE	2
DRAWN: 12/02/2019	CHECKED BY: RM								
REVISED: 01/09/2024	APPROVED BY: TK 1/10/2024								

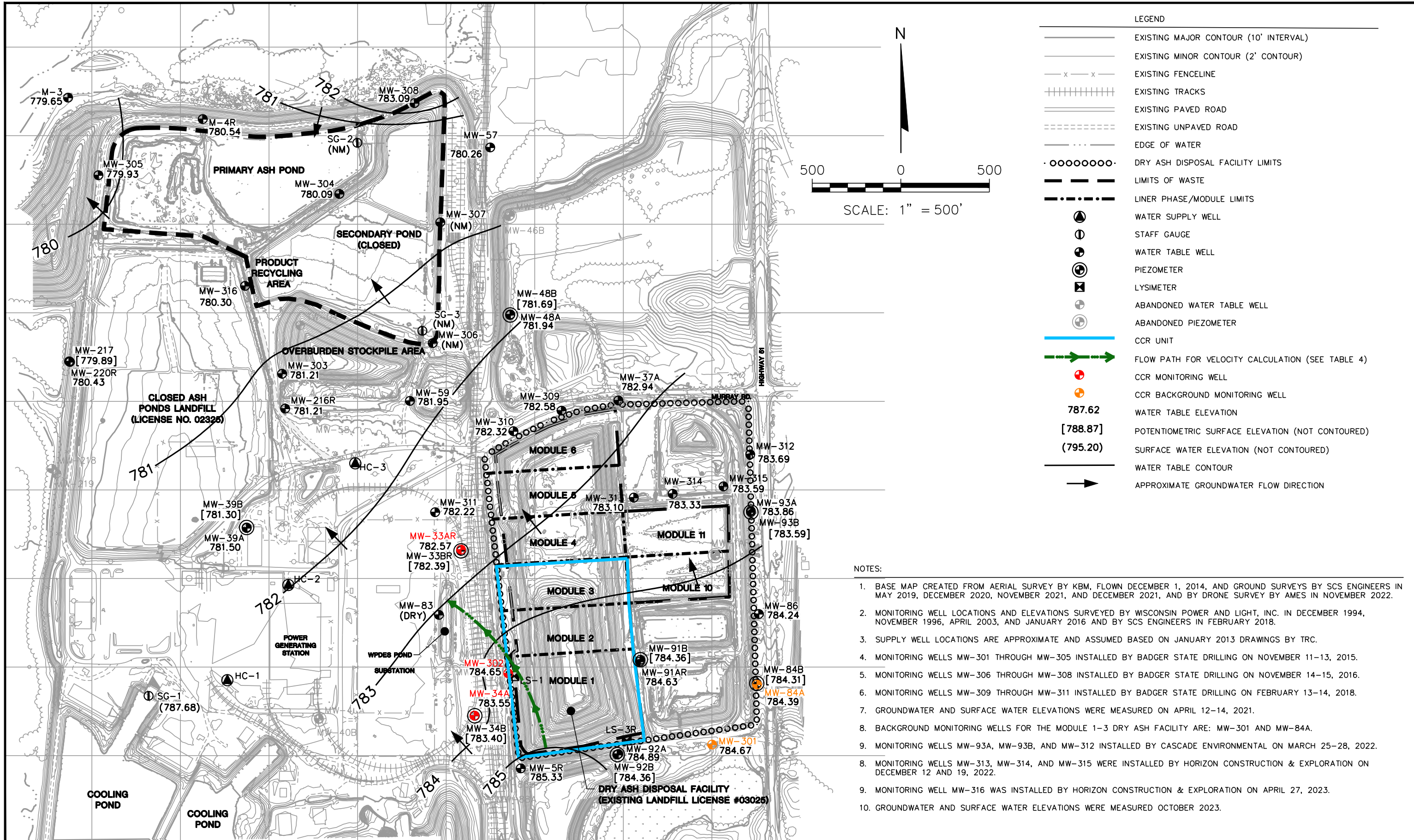
I:\25223067.00\Drawings\Modules 1-3\Site Plan and Monitoring Well Locations.dwg, 1/9/2024 10:28:19 AM



- 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 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
 9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
 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.
 10. DEWATERING WELLS WERE ACTIVE AROUND THE PRIMARY POND DURING THE APRIL 2023 SAMPLING EVENT.
 11. 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	 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 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	WATER TABLE MAP APRIL 2023	FIGURE 3
DRAWN:	10/12/2023	CHECKED BY:	NLB					
REVISED:	01/09/2024	APPROVED BY:	TK 1/29/2024					

I:\25223067.00\Drawings\Modules 1-3\Water Table Map-April 2023.dwg, 1/22/2024 9:27:17 AM




- 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
 - ⊗ 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

- 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 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
 9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
 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. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 2023.

PROJECT NO. 25223067.00	DRAWN BY: KP	<p>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830</p>	<p>CLIENT ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954</p>	<p>SITE ALLIANT ENERGY COLUMBIA ENERGY CENTER MODULES 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI</p>	<p>FIGURE 4</p>
DRAWN: 11/13/2023	CHECKED BY: NLB				
REVISED: 01/09/2024	APPROVED BY: TK 1/10/2024				

I:\25223067.00\Drawings\Modules 1-3\Water Table Map-October 2023.dwg, 1/9/2024 10:33:50 AM



Appendix A
Regional Hydrogeologic Information

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

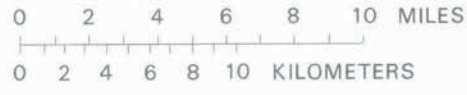
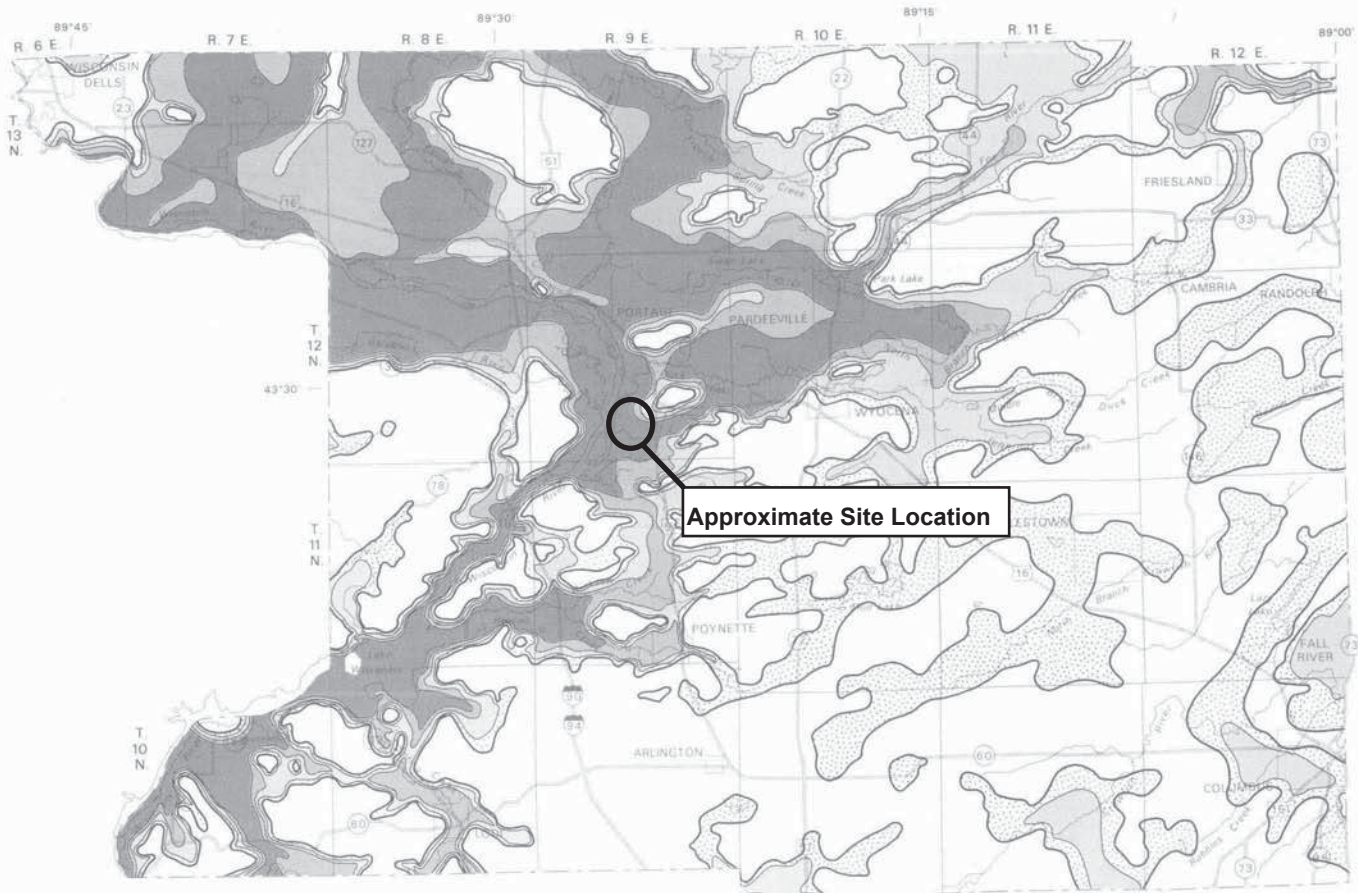
Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	<ul style="list-style-type: none"> Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	<ul style="list-style-type: none"> Dolomite and shaley dolomite Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	<ul style="list-style-type: none"> 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



EXPLANATION

Probable well yields

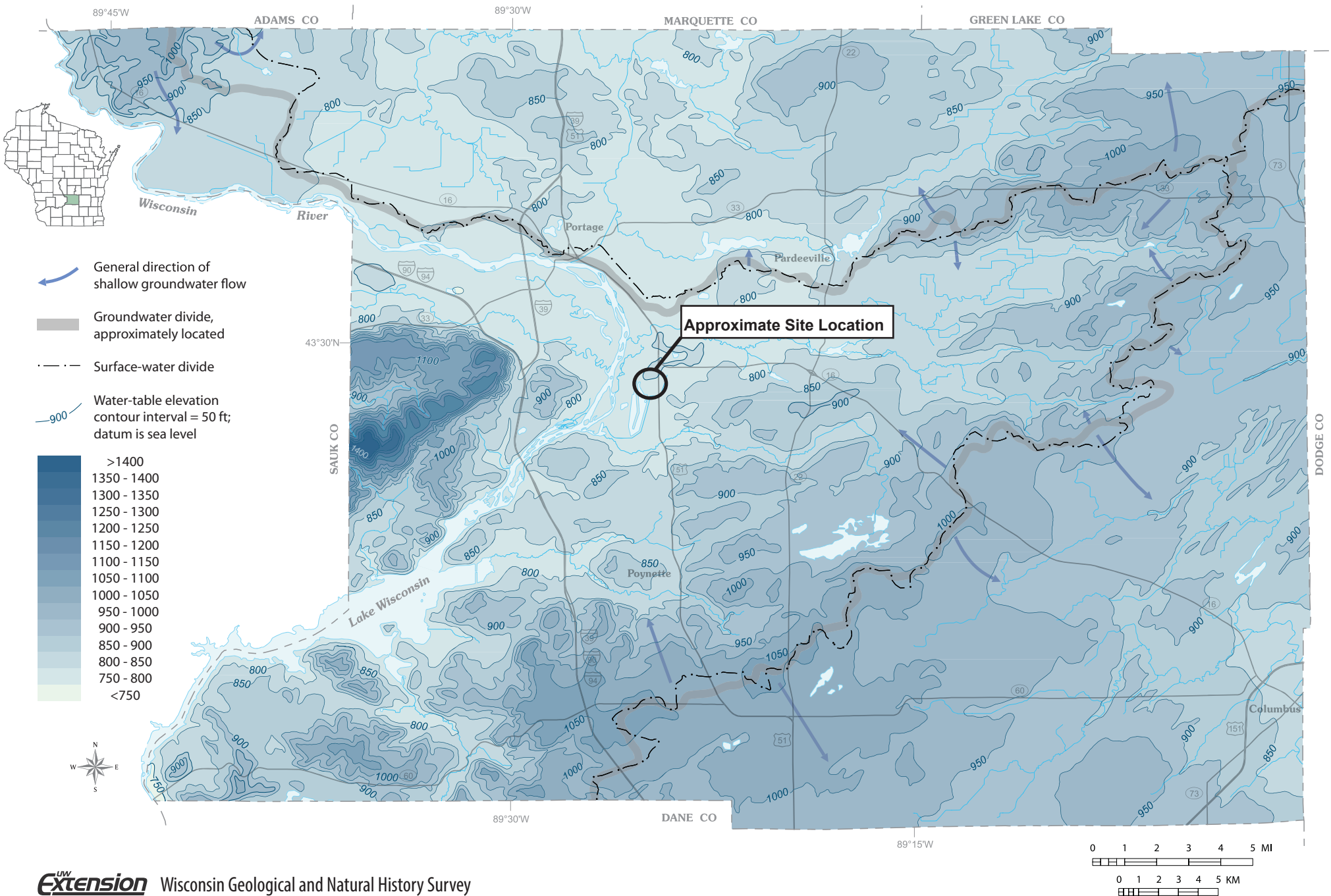
- 
 Chances of more than 100 gallons per minute are poor
- 
 Chances of 500-1000 gallons per minute are good
- 
 Chances of 100-500 gallons per minute are good
- 
 Chances of more than 1000 gallons per minute are good

—————
 Boundary of saturated sand-and-gravel aquifer

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 Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.
 02/26/2024 - Classification: Internal - ECRM13238614

Generalized water-table elevation in Columbia County, Wisconsin



Appendix B


Boring Logs and Well Construction Documentation

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

Facility/Project Name Alliant Energy - Columbia		License/Permit/Monitoring Number 03025		Boring Number MW-33AR	
Boring Drilled By: Name of crew chief (first, last) and Firm Ryan Fisher Boart Longyear		Date Drilling Started 4/9/2003	Date Drilling Completed 4/9/2003	Drilling Method 4 1/4" HSA	
WI Unique Well No. PE223	DNR Well ID No. 138	Common Well Name MW-33AR	Final Static Water Level Feet MSL	Surface Elevation 805.4 Feet MSL	Borehole Diameter 8.0 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>		State Plane 542,663 N, 2,123,584 E S/C/N		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SW 1/4 of Section 27, T 12 N, R 9 E		Lat _____ ' _____ "		Long _____ ' _____ "	
Facility ID 111049180	County Columbia	County Code 11	Civil Town/City/ or Village 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	Soil Properties						RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 27.5	Blind drilled to 29 feet. See log of MW-33BR for lithology.	SM										
				End of boring at 29 feet.											

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

Signature  Firm **RMT, Inc.** Tel: _____ 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.


WDNR_SBL_08 03024WDYR.GPJ WI_DNR98 GDT 7/18/03

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

Facility/Project Name Alliant Energy - Columbia		License/Permit/Monitoring Number 03025		Boring Number MW-33BR	
Boring Drilled By: Name of crew chief (first, last) and Firm Ryan Fisher Boart Longyear		Date Drilling Started 4/8/2003	Date Drilling Completed 4/9/2003		Drilling Method 4 1/4" HSA
WI Unique Well No. PE224	DNR Well ID No. 140	Common Well Name MW-33BR	Final Static Water Level 785.3 Feet MSL	Surface Elevation 805.3 Feet MSL	Borehole Diameter 8.0 inches
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 542,660 N, 2,123,585 E S/C/N NE 1/4 of SW 1/4 of Section 27, T 12 N, R 9 E			Local Grid Location Lat _____ " <input type="checkbox"/> N <input type="checkbox"/> E Long _____ " Feet <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID 111049180	County Columbia	County Code 11	Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
1 SS	24	4 4 4 4	5	SILTY SAND (SM), 85% fine to medium sand, 15% fines, nonplastic, 10YR 5/4 yellowish brown, no odor, moist.	SM									
2 SS	24	3 5 5 5	10											

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

Signature  Firm **RMT, Inc.** Tel: _____ 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

WDNR, SEL_96 03024WDNR.GPJ WI_DNR98.GDT 7/18/03

Boring Number **MW-33BR** Use only as an attachment to Form 4400-122.

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
3 SS	24	4 5 4 5	16 17 18 19											
4 SS	24	4 3 4 4	20 21 22 23	Same as above, but wet.	SM									
5 SS	24	50/0	25 26 27 28 29	Hit a rock, auger through.										
6 SS	24	8 20 19 27	30 31 32 33 34	SILTY SAND WITH GRAVEL (SM), 70% fine to medium sand, 15% gravel, 15% fines, nonplastic, 10YR 4/3 brown, wet, dense.										
7 SS	24	10 17 19 24	35 36 37 38 39 40		SM									

WDNR_SBL_98 03024WDYR.EPJ WL DNR98.GDT 7/1/803

Boring Number **MW-33BR** Use only as an attachment to Form 4400-122.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
8 SS	24	18 20 28 39	41	Same as above.										
9 SS	24	27 50/2	45		SM									
10 SS	24	7 50/1	53	WEATHERED SANDSTONE, 95% poorly graded medium sand, 5% fines, white to brown, well sorted and rounded, poorly cemented.										
			56	End of boring at 56 feet.										

WDNR_S&L_98 03024WDYR.GPJ W\DNF98.GDT 7/18/03

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

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

Facility/Project Name Alliant Energy - Columbia	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-33AR
Facility License, Permit or Monitoring No. 03025	Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Well Location <input checked="" type="checkbox"/> Lat. " ' " Long. " ' " or	Wis. Unique Well No. PE223 DNR Well Number 138
Facility ID 111049180	St. Plane 542,663 ft. N, 2,123,584 ft. E. S/C/N	Date Well Installed 04/09/2003
Type of Well Well Code 71/dw	Section Location of Waste/Source NE 1/4 of SW 1/4 of Sec. 27, T. 12 N, R. 9 E W	Well Installed By: (Person's Name and Firm) R. Fischer
Distance from Waste/Source 500 ft. Inf. Stds. Apply <input type="checkbox"/>	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number Boart Longyear

A. Protective pipe, top elevation <u>808.09</u> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <u>808.29</u> ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>4.0</u> in. b. Length: <u>7.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <u>805.4</u> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <u>804.4</u> ft. MSL or <u>1.0</u> ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 30 Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. <u>10.5</u> Lbs/gal mud weight ... Bentonite slurry <input checked="" type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. <u>3.5</u> Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input checked="" type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	6. Bentonite seal: a. Bentonite granules <input checked="" type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	7. Fine sand material: Manufacturer, product name & mesh size a. <u>#7 Badger</u> b. Volume added <u>0.5</u> ft ³
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. <u>#40 Badger</u> b. Volume added <u>4.5</u> ft ³
17. Source of water (attach analysis, if required):	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top <u>794.4</u> ft. MSL or <u>11.0</u> ft.	10. Screen material: <u>PVC</u> a. Screen Type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top <u>789.4</u> ft. MSL or <u>16.0</u> ft.	b. Manufacturer <u>Boart Longyear</u> c. Slot size: <u>0.010</u> in. d. Slotted length: <u>10.0</u> ft.
G. Filter pack, top <u>788.4</u> ft. MSL or <u>17.0</u> ft.	i. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
H. Screen joint, top <u>787.4</u> ft. MSL or <u>18.0</u> ft.	
I. Well bottom <u>777.4</u> ft. MSL or <u>28.0</u> ft.	
J. Filter pack, bottom <u>776.4</u> ft. MSL or <u>29.0</u> ft.	
K. Borehole, bottom <u>776.4</u> ft. MSL or <u>29.0</u> ft.	
L. Borehole, diameter <u>8.0</u> in.	
M. O.D. well casing <u>2.37</u> in.	
N. I.D. well casing <u>2.06</u> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.
Signature R. Fischer Firm RMT, Inc. Tel: _____ Fax: _____

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.

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 8536, MADISON, WIS. 53715 • TEL. (608) 257-4848

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

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling _____

Upon Completion of Drilling _____

Time After Drilling _____

Depth to Water _____

Depth to Cave In _____

10/5/83 10/5/83

Start _____ Complete _____

Crew Chief JVS Rig B-40

Drilling Method ED 0-37'

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

Facility/Project Name Alliant Energy - Columbia	County Columbia	Well Name MW-33AR	
Facility License, Permit or Monitoring Number 03025	County Code 11	Wis. Unique Well Number PE223	DNR Well Number 138

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 **60 min.**

4. Depth of well (from top of well casing) **31.3 ft.**

5. Inside diameter of well **2.06 in.**

6. Volume of water in filter pack and well casing **6.0 gal.**

7. Volume of water removed from well **35.0 gal.**

8. Volume of water added (if any) **0.0 gal.**

9. Source of water added _____

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

17. Additional comments on development:
Pumped dry 3 times.

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 23.47 ft.	23.62 ft.
Date	b. 4/10/2003	4/10/2003
Time	c. 08:50 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	11:50 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	0.0 inches	0.0 inches
13. Water clarity (Describe)	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 <u>Opaque, brown</u>	Clear <input type="checkbox"/> 2 0 Turbid <input checked="" type="checkbox"/> 2 5 <u>Slight, tan</u>

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

14. Total suspended solids **72 mg/l**

15. COD **mg/l**

16. Well developed by: Person's Name and Firm

Peter M. Chase
RMT, Inc.

Facility Address or Owner/Responsible Party Address

Name: Peter M. Chase

Firm: RMT, Inc.

Street: 744 Heartland Tr.

City/State/Zip: Madison, WI 53717

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

Signature: 

Print Name: Peter M. Chase

Firm: RMT, Inc.

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

FACILITY NAME
Wisconsin Power and Light Co. Dry Ash

SAMPLING REQUIRED (✓ ONE) YES NO
POINT (✓ ONE) CAN BE SAMPLED CANNOT BE SAMPLED

COMMON NAME OF SAMPLING POINT
mw 34A

PREVIOUS COMMON NAME OF SAMPLING POINT

FACILITY ID NO.

POINT ID NO.

TYPE OF POINT (✓ ONE)
 1 (G) GROUND WATER
 11 MONITOR WELL
 12 PIEZOMETER
 13 PRIVATE WELL
 14 LYSIMETER
 15 SPRING
 16 RESISTIVITY PROBE
 2 (L) LEACHATE
 21 FLOW OR SEEP
 22 POND
 23 COLLECTION SYSTEM
 3 (S) SURFACE WATER
 31 UPSTREAM
 32 MID-SITE
 33 DOWNSTREAM
 34 RUN-OFF
 35 IMPOUNDED

POINT LOCATION
2,155 . 200 FT. (+) E. (-) W.
541 . 742 FT. (+) N. (-) S.
 FROM GRID ORIGIN BENCHMARK

DATE POINT ESTABLISHED
09/28/77
 MON DAY YEAR

COMMENTS ABOUT SAMPLING POINT:

Well depth - 30.6' Gradient from landfill down gradient
Geologic formation of well screen - sand
Location of well seals/materials used - bentonite seal above well screen

WELL DESCRIPTION	REQUIRED SAMPLING (MG/L except as noted)		
	NO.	PARAMETERS	MONTHS OF REQUIRED SAMPLING
PIPE DIAMETER <u>2.00</u> INCHES	<input checked="" type="checkbox"/> 00410	ALKALINITY (AS CA CO ₃)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00310	BOD (5 DAY)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00916	CALCIUM	1-2-3-4-5-6-7-8-9-10-11-12
PIPE TOP ELEVATION <u>806.00</u> FEET <input checked="" type="checkbox"/> MSL <input type="checkbox"/> BITE	<input type="checkbox"/> 00307	CHLORIDES	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00340	COD	1-2-3-4-5-6-7-8-9-10-11-12
GROUND SURFACE ELEVATION <u>802.70</u> FEET <input checked="" type="checkbox"/> MSL <input type="checkbox"/> SITE	<input checked="" type="checkbox"/> 00872	CONDUCTIVITY (SU)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00277	COPPER (DISSOLVED)	1-2-3-4-5-6-7-8-9-10-11-12
TYPE OF CASING (✓ ONE) <input checked="" type="checkbox"/> 1 PLASTIC <input type="checkbox"/> 2 STEEL	<input checked="" type="checkbox"/> 00900	HARDNESS (AS CA CO ₃)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 01046	IRON (DISSOLVED)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00348	MAGNESIUM	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00620	NITRATES (AS NO ₃)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00640	NITROGEN (TOTAL INORGANIC N)	1-2-3-4-5-6-7-8-9-10-11-12
COMMENTS ABOUT REQUIRED SAMPLING: <u>Avg. vol. of water to be bailed:</u>	<input checked="" type="checkbox"/> 00400	PH (SU)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00129	PHENOLS	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00929	SOLIUM	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00945	SULFATES	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00360	TOTAL DIS. SOLIDS	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00842	WATER ELEVATION (FT. MSL)	1-2-3-4-5-6-7-8-9-10-11-12
	<input type="checkbox"/> 00275	ZINC (DISSOLVED)	1-2-3-4-5-6-7-8-9-10-11-12
	NO.	PARAMETERS (OTHERS)	MONTHS
<u>Groundwater flow - westerly</u>	<input checked="" type="checkbox"/> 01022	Boron	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/>	Color	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/>	Odor	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/>	Turbidity	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 01002	Arsenic	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 01007	Barium	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00312	Cadmium	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00273	Chromium	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00240	Lead	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00126	Mercury	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 00270	Selenium	1-2-3-4-5-6-7-8-9-10-11-12
	<input checked="" type="checkbox"/> 01077	Silver	1-2-3-4-5-6-7-8-9-10-11-12

SUBSTATION

ASH POND
DISCHARGE
DRAINAGE DITCH
ERR
B*34A&B

medium to
coarse sand
and gravel

fill-
fine to
medium
sand

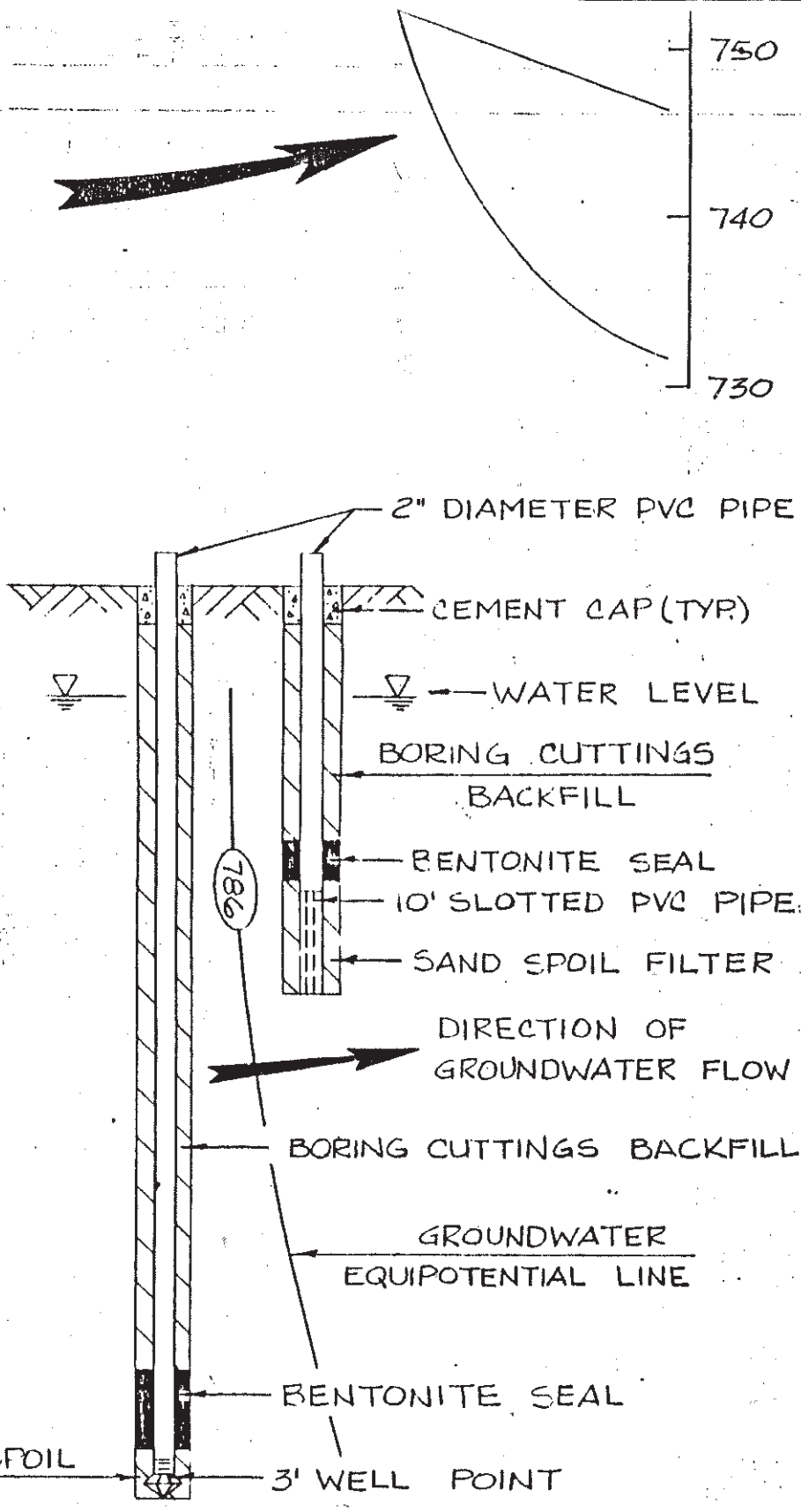
fine to
medium
sand

dstone



Scale:
Horizontal 1"=100'
Vertical 1"=10'
No legend available

Warzyn Engineering Inc.
Geologic Cross Sections
Drawing No. C7134-11
Date 1-20-78



TYPICAL MONITORING WELL DETAIL

NOT TO SCALE

Date - 1-20-78 Drawing No. 7134-9

Warzyn Engineering Inc.

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

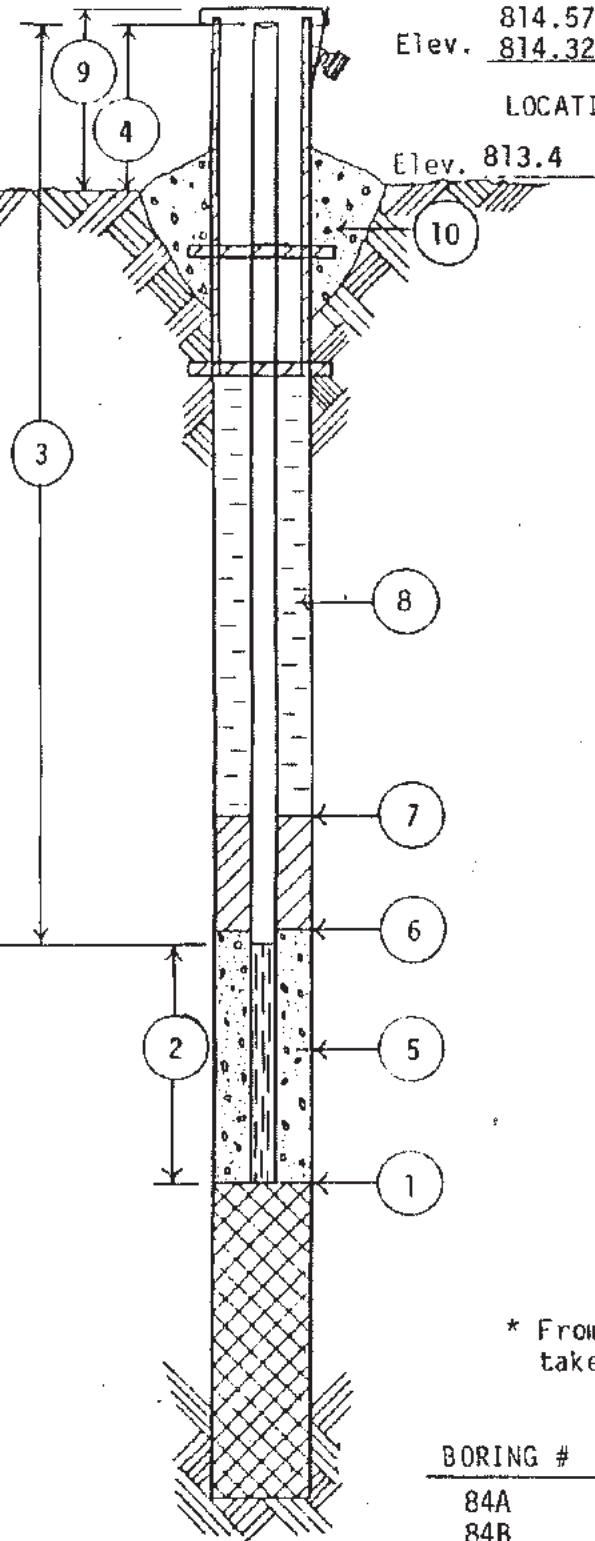
DATE 10/5/83

Elev. 814.57 Steel
Elev. 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"	

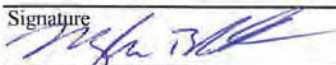


Route To: Watershed/Wastewater Waste Management
 Remediation/Redevelopment Other

Facility/Project Name WPL-Columbia SCS#: 25215135.00		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State Drilling			Date Drilling Started 11/11/2015	Date Drilling Completed 11/11/2015	Drilling Method hollow stem auger
WI Unique Well No. VY701	DNR Well ID No.	Common Well Name	Final Static Water Level Feet	Surface Elevation 803.69 Feet	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 541562.2 N, 2025001.0 E S/C/N			Local Grid Location		
1/4 of 1/4 of Section 27, T 12 N, R 9 E			Lat _____ "	Long _____ "	<input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID	County Columbia	County Code 11	Civil Town/City/ or Village Portage		

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

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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-301**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

Sample		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					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S7	20	5 4 4 3	16 17	SILTY SAND, yellowish brown (10YR 5/6), fine to medium grained.											
S8	20	2 4 4 5	18 19 20												
S9	23	4 4 3 6	21 22												SM
S10	21	3 2 4 10	23 24 25												Same as above except, 10YR 6/4.
				28	End of boring at 28 ft bgs.										

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

Facility/Project Name WPL-Columbia		SCS#: 25215135.00		License/Permit/Monitoring Number	Boring Number MW-302
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State Drilling			Date Drilling Started 11/11/2015	Date Drilling Completed 11/12/2015	Drilling Method hollow stem auger
WI Unique Well No. VY702	DNR Well ID No.	Common Well Name	Final Static Water Level Feet	Surface Elevation 809.93 Feet	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Pla 541964.7 N, 2123849 E S/C/N			Lat _____ "	Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
1/4 of _____		1/4 of Section 27, T 12 N, R 9 E	Long _____ "	Feet _____ Feet _____	
Facility ID	County Columbia	County Code 11	Civil Town/City/ or Village Portage		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments				
									Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200					
S1	12	10 13 17 16	1 2	SILTY SAND, fine to medium grained, trace gravel, 10YR 5/6.														
S2	12	10 12 8 6	4 5	Same as above except, large gravel at bottom, trace to little gravel.														
S3	20	2 4 4 5	7	Same as above except, 10YR 4/6.	SM													
S4	23	3 3 4 5	9 10	Same as above except, 10YR 5/8.														
S5	20	3 3 3 4	12	Same as above except, 10YR 6/6.														
S6	20	3 4 4 7	14 15	POORLY GRADED SAND, 10YR 6/6.	SP													

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

Signature <i>[Signature]</i> for Zach Watson	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53711	Tel: (608) 224-2830 Fax:
---	--	-----------------------------

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

Boring Number **MW-302**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Pocket Penetration (tsf)	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S7	20	6 8	16	POORLY GRADED SAND, light tan 10YR 8/3.										
		10 12	17											M
S8	20	5 6	19		SP									
		8 8	20											M
S9	19	3 3	21											
		3 2	22											M
S10	20	3 3	23	SILTY SAND, 10YR 5/6.	SM									
		8 8	24	W										
S11	23	5 9	25	POORLY GRADED SAND, 10YR 8/3.										
		12 12	26	W										
			27	Same as above except, light tan 10YR 6/6.										
			30		SP									
			35	End of boring at 35 ft bgs.										

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

Facility/Project Name Alliant-Columbia	County Name Columbia	Well Name MW-301	
Facility License, Permit or Monitoring Number	County Code 11	Wis. Unique Well Number VY701	DNR Well ID Number

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 _____ 120 min.

4. Depth of well (from top of well casing) _____ 29 . 4 ft.

5. Inside diameter of well _____ 2 . 00 in.

6. Volume of water in filter pack and well casing _____ 7 . 6 gal.

7. Volume of water removed from well _____ 84 . 0 gal.

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

9. Source of water added _____

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 21 . 72 ft.	_____ 21 . 77 ft.
Date	b. _____ 12 / _____ 02 / _____ 2015	_____ 12 / _____ 02 / _____ 2015
Time	c. _____ 08 : 30 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ 10 : 30 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ 0 . inches	_____ 0 . inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 (Describe) _____	Clear <input checked="" type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (Describe) _____

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: Gary Last Name: Sterkel
 Firm: SCS ENGINEERS

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party

First Name: Nate Last Name: Sievers

Facility/Firm: Wisconsin Power and Light

Street: W8375 Murray Rd.

City/State/Zip: Pardeville, WI 53954

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

Signature: *[Handwritten Signature]* for Gary Sterkel

Print Name: Gary Sterkel

Firm: SCS ENGINEERS

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

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

Facility/Project Name Alliant - Columbia	County Name Columbia	Well Name MW-302	
Facility License, Permit or Monitoring Number	County Code 11	Wis. Unique Well Number VY702	DNR Well ID Number

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 _____ 120 min.

4. Depth of well (from top of well casing) _____ 33 . 6 ft.

5. Inside diameter of well _____ 2 . 00 in.

6. Volume of water in filter pack and well casing _____ 5 . 4 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)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 28 . 37 ft.	_____ 28 . 41 ft.
Date	b. _____ 12 / _____ 02 / _____ 2015	_____ 12 / _____ 02 / _____ 2015
Time	c. _____ 02 : 00 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	_____ 04 : 00 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ 0 . inches	_____ 0 . inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 (Describe)	Clear <input checked="" type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (Describe)
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:	Gary	
Last Name:	Sterkel	
Firm:	SCS ENGINEERS	

Name and Address of Facility Contact /Owner/Responsible Party

First Name: Nate Last Name: Sievers
Name: _____ Name: _____

Facility/Firm: Wisconsin Power and Light

Street: W8375 Murray Rd.

City/State/Zip: Pardeeville, WI 53954

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

Signature: *Gary Sterkel* for SCS.

Print Name: Gary Sterkel

Firm: SCS ENGINEERS

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

State of Wisconsin
Department of Natural Resources

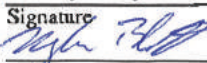
Route to: Watershed/Wastewater Waste Management
 Remediation/Redevelopment Other

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

Facility/Project Name WPL-Columbia	Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. _____ " Long. _____ " or _____	Wis. Unique Well No. DNR Well ID No. VY701
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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number _____
Enf. Stds. Apply <input type="checkbox"/>		Badger State Drilling

A. Protective pipe, top elevation --- 807.16 ft. MSL	1. Cap and lock? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation --- 806.89 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in. b. Length: --- 5 ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation --- 803.69 ft. MSL	d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
D. Surface seal, bottom --- 791.69 ft. MSL or --- 12 ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 30 Other <input type="checkbox"/>
13. Sieve analysis performed? <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft ³ volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. _____ 4 ft ³ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. Fine sand material: Manufacturer, product name & mesh size a. _____ RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added _____ 0.5 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. _____ RW Sidley #5 <input type="checkbox"/> b. Volume added _____ 2 ft ³
17. Source of water (attach analysis, if required): _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top --- 803.69 ft. MSL or --- 0 ft.	10. Screen material: PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top --- 791.69 ft. MSL or --- 12 ft.	b. Manufacturer _____ Johnson c. Slot size: 0.01 in. d. Slotted length: --- 10 ft.
G. Filter pack, top --- 789.69 ft. MSL or --- 14 ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 14 Other <input checked="" type="checkbox"/>
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.	

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 53718-6751

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

State of Wisconsin
Department of Natural Resources

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. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-302
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location Lat. <input type="checkbox"/> " Long. <input type="checkbox"/> or	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
Facility ID	St. Plane 541964.7 ft. N. 2123849 ft. E. S/C/N	Date Well Installed 11 / 12 / 2015 m m d d y y y y
Type of Well Well Code 11 / MW	Section Location of Waste/Source SE 1/4 of SW 1/4 of Sec. 27, T. 12 N, R. 9 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst
Distance from Waste/Source <input type="checkbox"/> ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Badger State Drilling

A. Protective pipe, top elevation	813.19 ft. MSL	1. Cap and lock?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation	813.00 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	809.93 ft. MSL	a. Inside diameter:	6 in.
D. Surface seal, bottom	793.53 ft. MSL or 16.4 ft.	b. Length:	5 ft.
12. USCS classification of soil near screen:		c. Material:	Steel <input type="checkbox"/> 04 Other <input type="checkbox"/>
GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/>		d. Additional protection?	<input type="checkbox"/> Yes <input type="checkbox"/> No
SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/>		If yes, describe: yes bumper posts	
Bedrock <input type="checkbox"/>		3. Surface seal:	Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
13. Sieve analysis performed?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Material between well casing and protective pipe:	Bentonite <input checked="" type="checkbox"/> 30 Other <input type="checkbox"/>
14. Drilling method used:	Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	Bentonite to grade, sand above	Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01		5. Annular space seal:	a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 d. % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 e. Ft ³ volume added for any of the above
Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		f. How installed:	Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
16. Drilling additives used?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Bentonite seal:	a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input type="checkbox"/> 32 c. 4.7 ft ³ Other <input type="checkbox"/>
Describe		7. Fine sand material: Manufacturer, product name & mesh size	
17. Source of water (attach analysis, if required):		a. RW Sidley Inc. #7	<input type="checkbox"/>
		b. Volume added 1 ft ³	
		8. Filter pack material: Manufacturer, product name & mesh size	
		a. RW Sidley #5	<input type="checkbox"/>
		b. Volume added 2.5 ft ³	
E. Bentonite seal, top	809.93 ft. MSL or 0 ft.	9. Well casing:	Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
F. Fine sand, top	793.53 ft. MSL or 16.4 ft.	10. Screen material: PVC	
G. Filter pack, top	791.53 ft. MSL or 18.4 ft.	a. Screen type:	Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
H. Screen joint, top	789.53 ft. MSL or 20.4 ft.	b. Manufacturer Johnson	
I. Well bottom	779.53 ft. MSL or 30.4 ft.	c. Slot size: 0.01 in.	
J. Filter pack, bottom	776.93 ft. MSL or 33 ft.	d. Slotted length: 10 ft.	
K. Borehole, bottom	776.93 ft. MSL or 33 ft.	11. Backfill material (below filter pack):	None <input type="checkbox"/> 14 Other <input checked="" type="checkbox"/>
L. Borehole, diameter	8.5 in.		
M. O.D. well casing	2 3/8 in.		
N. I.D. well casing	2 in.		

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

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

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



Appendix C
Laboratory Reports

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

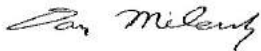
Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

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

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

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

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 430492

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2479204

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

LABORATORY CONTROL SAMPLE: 2479205

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2479206 2479207

Parameter	Units	40253959001		2479207		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	ug/L	<0.066	5	5	5.0	4.8	100	95	85-115	5	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 431884 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

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

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

LABORATORY CONTROL SAMPLE: 2487055

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056		2487057		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	<0.15	250	250	268	263	107	105	75-125	2	20		
Arsenic	ug/L	0.30J	250	250	260	260	104	104	75-125	0	20		
Barium	ug/L	7.5	250	250	250	245	97	95	75-125	2	20		
Beryllium	ug/L	<0.25	250	250	268	265	107	106	75-125	1	20		
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20		
Cadmium	ug/L	<0.15	250	250	259	254	104	102	75-125	2	20		
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	20	P6	
Chromium	ug/L	<1.0	250	250	251	247	100	99	75-125	1	20		
Cobalt	ug/L	0.46J	250	250	247	244	99	97	75-125	1	20		
Lead	ug/L	<0.24	250	250	260	257	104	103	75-125	1	20		
Lithium	ug/L	0.37J	250	250	272	255	109	102	75-125	6	20		
Molybdenum	ug/L	<0.44	250	250	256	255	102	102	75-125	0	20		
Selenium	ug/L	<0.32	250	250	271	267	108	107	75-125	1	20		
Thallium	ug/L	<0.14	250	250	258	257	103	103	75-125	1	20		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

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

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

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

LABORATORY CONTROL SAMPLE: 2477982

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

SAMPLE DUPLICATE: 2477983

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 430502

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

SAMPLE DUPLICATE: 2479241

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

SAMPLE DUPLICATE: 2479545

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 430807 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: 40253965001, 40253965002

METHOD BLANK: 2480961 Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

LABORATORY CONTROL SAMPLE: 2480962

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480963 2480964

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 544795

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: 40253965001, 40253965002

METHOD BLANK: 2644705

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 544797

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: 40253965001, 40253965002

METHOD BLANK: 2644706

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

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

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Client Name: SCS Engineering

Sample Preservation Receipt Form

Project # 41253965

All containers needing preservation have been checked and noted below:

Yes No N/A

Lab Lot# of pH paper: W57722

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

Initial when completed: SB

Date/Time

Pace Lab #	Glass			Plastic			Vials				Jars			General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥5	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)																		
	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												
001									2		1															2														2.5/5
003																																							2.5/5	
005																																							2.5/5	
007																																							2.5/5	
009																																							2.5/5	
011																																							2.5/5	
013																																							2.5/5	
015																																							2.5/5	
017																																							2.5/5	
019																																							2.5/5	

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

AG1U	1 liter amber glass	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 amber glass NaOH
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineering

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

WO#: **40253965**



Tracking #: _____

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

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

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 123 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 0 / Corr: 0.2

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 10/11/22 / Initials: SG

Labeled By Initials: NK

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

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

December 29, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

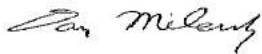
Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

- Pace Analytical Services - Green Bay

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 434044	Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A	Analysis Description: 6020B MET
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40255945001, 40255945002

METHOD BLANK: 2498851 Matrix: Water

Associated Lab Samples: 40255945001, 40255945002

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

LABORATORY CONTROL SAMPLE: 2498852

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2498853 2498854

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR MOD 1-3
Pace Project No.: 40253963

Dear Meghan Blodgett:

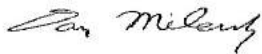
Enclosed are the analytical results for sample(s) received by the laboratory on October 31, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

- Pace Analytical Services - Green Bay

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40253963001	MW-302	Water	10/27/22 14:15	10/31/22 09:15
40253963002	MW-33AR	Water	10/27/22 12:50	10/31/22 09:15
40253963003	MW-34A	Water	10/27/22 11:25	10/31/22 09:15
40253963004	FIELD BLANK-MOD1-3LF	Water	10/27/22 12:50	10/31/22 09:15
40253963005	MW-312	Water	10/28/22 00:00	10/31/22 15:35
40253963006	MW-93B	Water	10/28/22 15:05	10/31/22 15:35

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40253963001	MW-302	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253963002	MW-33AR	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253963003	MW-34A	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253963004	FIELD BLANK-MOD1-3LF	EPA 6020B	KXS	2
			SM 2540C	SRK
		EPA 9040	YER	1
		EPA 300.0	HMB	3
		40253963005	MW-312	
40253963006	MW-93B		JXA	1

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: MW-302 **Lab ID: 40253963001** Collected: 10/27/22 14:15 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay							
Boron	374	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 16:00	7440-42-8	
Calcium	91200	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 16:00	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.25	Std. Units			1		10/27/22 14:15		
Field Specific Conductance	616.1	umhos/cm			1		10/27/22 14:15		
Oxygen, Dissolved	8.60	mg/L			1		10/27/22 14:15	7782-44-7	
REDOX	38.2	mV			1		10/27/22 14:15		
Turbidity	0.00	NTU			1		10/27/22 14:15		
Static Water Level	784.62	feet			1		10/27/22 14:15		
Temperature, Water (C)	11.6	deg C			1		10/27/22 14:15		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	348	mg/L	20.0	8.7	1		11/01/22 11:29		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.4	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	2.1	mg/L	2.0	0.43	1		11/12/22 14:26	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/14/22 13:00	16984-48-8	
Sulfate	30.3	mg/L	2.0	0.44	1		11/12/22 14:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: MW-33AR **Lab ID: 40253963002** Collected: 10/27/22 12:50 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Boron	586	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 16:07	7440-42-8	
Calcium	77000	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 16:07	7440-70-2	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.54	Std. Units			1		10/27/22 12:50		
Field Specific Conductance	737	umhos/cm			1		10/27/22 12:50		
Oxygen, Dissolved	8.91	mg/L			1		10/27/22 12:50	7782-44-7	
REDOX	101.2	mV			1		10/27/22 12:50		
Turbidity	0.00	NTU			1		10/27/22 12:50		
Static Water Level	781.94	feet			1		10/27/22 12:50		
Temperature, Water (C)	12.7	deg C			1		10/27/22 12:50		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	440	mg/L	20.0	8.7	1		11/01/22 11:29		
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		11/03/22 13:55		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	40.5	mg/L	20.0	4.3	10		11/12/22 14:40	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/14/22 13:14	16984-48-8	
Sulfate	153	mg/L	20.0	4.4	10		11/12/22 14:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: MW-34A **Lab ID: 40253963003** Collected: 10/27/22 11:25 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Boron	264	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 16:14	7440-42-8	
Calcium	87300	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 16:14	7440-70-2	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.53	Std. Units			1		10/27/22 11:25		
Field Specific Conductance	648.0	umhos/cm			1		10/27/22 11:25		
Oxygen, Dissolved	8.46	mg/L			1		10/27/22 11:25	7782-44-7	
REDOX	38.8	mV			1		10/27/22 11:25		
Turbidity	1.76	NTU			1		10/27/22 11:25		
Static Water Level	783.61	feet			1		10/27/22 11:25		
Temperature, Water (C)	12.6	deg C			1		10/27/22 11:25		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	436	mg/L	20.0	8.7	1		11/01/22 11:30		
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		11/03/22 13:55		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	2.2	mg/L	2.0	0.43	1		11/12/22 14:55	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/14/22 13:28	16984-48-8	
Sulfate	169	mg/L	20.0	4.4	10		11/14/22 12:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: FIELD BLANK-MOD1-3LF **Lab ID:** 40253963004 Collected: 10/27/22 12:50 Received: 10/31/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Boron	<3.0	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 15:37	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 15:37	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		11/01/22 11:30		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.2	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		11/12/22 15:10	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/14/22 13:43	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		11/12/22 15:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: MW-312 **Lab ID: 40253963005** Collected: 10/28/22 00:00 Received: 10/31/22 15:35 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Static Water Level	783.50	feet			1		10/28/22 00:00		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

Sample: MW-93B **Lab ID: 40253963006** Collected: 10/28/22 15:05 Received: 10/31/22 15:35 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Static Water Level	782.76	feet			1		10/28/22 15:05		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

QC Batch:	431884	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3010A	Analysis Description:	6020B MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

METHOD BLANK: 2487054 Matrix: Water
Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	11/30/22 12:41	
Calcium	ug/L	<76.2	254	11/30/22 12:41	

LABORATORY CONTROL SAMPLE: 2487055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	253	101	80-120	
Calcium	ug/L	10000	10200	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056 2487057

Parameter	Units	40253965001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20	
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

QC Batch:	430299	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

METHOD BLANK: 2477981 Matrix: Water
Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

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

LABORATORY CONTROL SAMPLE: 2477982

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

SAMPLE DUPLICATE: 2477983

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

QC Batch:	430502	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

SAMPLE DUPLICATE: 2479241

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

SAMPLE DUPLICATE: 2479545

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

QC Batch:	430807	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: 40253963001, 40253963002, 40253963003, 40253963004

METHOD BLANK: 2480961 Matrix: Water
Associated Lab Samples: 40253963001, 40253963002, 40253963003, 40253963004

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

LABORATORY CONTROL SAMPLE: 2480962

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480963 2480964

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222067 COLUMBIA CCR MOD 1-3

Pace Project No.: 40253963

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR MOD 1-3
Pace Project No.: 40253963

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40253963001	MW-302	EPA 3010A	431884	EPA 6020B	431956
40253963002	MW-33AR	EPA 3010A	431884	EPA 6020B	431956
40253963003	MW-34A	EPA 3010A	431884	EPA 6020B	431956
40253963004	FIELD BLANK-MOD1-3LF	EPA 3010A	431884	EPA 6020B	431956
40253963001	MW-302				
40253963002	MW-33AR				
40253963003	MW-34A				
40253963005	MW-312				
40253963006	MW-93B				
40253963001	MW-302	SM 2540C	430299		
40253963002	MW-33AR	SM 2540C	430299		
40253963003	MW-34A	SM 2540C	430299		
40253963004	FIELD BLANK-MOD1-3LF	SM 2540C	430299		
40253963001	MW-302	EPA 9040	430502		
40253963002	MW-33AR	EPA 9040	430502		
40253963003	MW-34A	EPA 9040	430502		
40253963004	FIELD BLANK-MOD1-3LF	EPA 9040	430502		
40253963001	MW-302	EPA 300.0	430807		
40253963002	MW-33AR	EPA 300.0	430807		
40253963003	MW-34A	EPA 300.0	430807		
40253963004	FIELD BLANK-MOD1-3LF	EPA 300.0	430807		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY / Analytical Request Document

4028963

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:		Page : 1 Of 1	
Company: SCS ENGINEERS		Report To: Meghan Blodgett		Attention:		Regulatory Agency	
Address: 2830 Dairy Drive		Copy To:		Company Name:		State / Location	
Madison, WI 53718		Purchase Order #:		Address:		WI	
Email: mblodgett@scsengineers.com		Project Name: 25219067 Columbia CCR Mod 1-3		Pace Quote:			
Phone: 608-216-7362 Fax:		Project #: 25222067		Pace Project Manager: dan.milewsky@pacelabs.com			
Requested Due Date:				Pace Profile #: 3948-12,13			

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 / , -) Sample IDs must be unique	MATRIX	CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives								Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)										
				START DATE	END DATE			Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test	Metal(B/Ca)	TDS and pH	Metals (Full list)	Radium 226	Radium 228	Chloride/Fluoride/Sulfate														
1	MW-302	WT			10/27/22	1415												X	X																001	
2	MW-33AR	WT			10/27/22	2250												X	X															002		
3	MW-34A	WT			10/27/22	1125												X	X															003		
4	FIELD BLANK-MOD1-3LF	WT			10/27/22	1250												X	X	X	X	X												004		
5	MW-33A	WT																X	X	X	X	X												Removed from program		
6																																				
7																																				
8																																				
9																																				
10																																				
11																																				
12																																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
ALL SAMPLES UNFILTERED Full list metals=Sb,As,B,Ba,Ca,Cd,Cr,Cu,Pb,U,Mn,Se,Tl and Hg	Adam Watson, SCSEng	10/28/22	1530	CS Logist,CS	10/28/22	09:15	Matt Tom Sammelbeck Pace 10/28/22 09:15 0.5 Y N Y

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

Effective Date: 8/16/2022

Sample Preservation Receipt Form

Client Name: SCS Engineering
 All containers needing preservation have been checked and noted below:
 Lab Lot# of pH paper: W06722

Project # L4053963
 Yes No N/A
 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: SS Date/Time:

Pace Lab #	Glass						Plastic					Vials					Jars			General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)																									
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JG1U	JG9U	WG1U								WPFU	SP5T	ZPLC	GN 1	GN 2																				
001								<u>2</u>																																													2.5 / 5
003								<u>2</u>	<u>1</u>																																						2.5 / 5						
005	08/16/22																																																				
007	10/3/22																																																				
009	10/3/22																																																				
011	10/3/22																																																				
013	10/3/22																																																				
015	10/3/22																																																				
017	10/3/22																																																				
019	10/3/22																																																				

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

AG1U 1 liter amber glass	BP1U 1 liter plastic unpres	VG9C 40 mL clear ascorbic w/ HCl	JG1U 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	WG1U 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

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineering

WO#: 40253963

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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-119 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1 / 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: 10/3/22 Initials: SG
Labeled By Initials: NK

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

May 26, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

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

Revised Report: REDOX has been added to the field data list for MW-84A.

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261460001	MW-301	Water	04/27/23 12:20	04/28/23 08:40
40261460002	MW-84A	Water	04/27/23 14:05	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40261460001	MW-301	EPA 6020B	TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40261460002	MW-84A	EPA 6020B	TXW
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	SRK			1	PASI-G
EPA 300.0	HMB			3	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:01	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:01	7440-38-2	
Barium	9.8	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:01	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:01	7440-41-7	
Boron	20.1	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:01	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:01	7440-43-9	
Calcium	120000	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:01	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:01	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:01	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:01	7439-92-1	
Lithium	0.62J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:01	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:01	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:01	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:01	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:00	7439-97-6	M0
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.65	Std. Units			1		04/27/23 12:20		
Field Specific Conductance	857.0	umhos/cm			1		04/27/23 12:20		
Oxygen, Dissolved	6.50	mg/L			1		04/27/23 12:20	7782-44-7	
REDOX	95.3	mV			1		04/27/23 12:20		
Turbidity	0.00	NTU			1		04/27/23 12:20		
Static Water Level	787.57	feet			1		04/27/23 12:20		
Temperature, Water (C)	8.0	deg C			1		04/27/23 12:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	526	mg/L	20.0	8.7	1		05/01/23 10:51		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.9	Std. Units	0.10	0.010	1		05/02/23 16:48		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.5J	mg/L	2.0	0.43	1		05/12/23 16:00	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:00	16984-48-8	
Sulfate	12.3	mg/L	2.0	0.44	1		05/12/23 16:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-84A **Lab ID: 40261460002** Collected: 04/27/23 14:05 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:08	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:08	7440-38-2	
Barium	12.6	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:08	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:08	7440-41-7	
Boron	10.3	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:08	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:08	7440-43-9	
Calcium	68600	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:08	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:08	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:08	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:08	7439-92-1	
Lithium	0.71J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:08	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:08	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:08	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:08	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:12	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.01	Std. Units			1		04/27/23 14:05		
Field Specific Conductance	556.6	umhos/cm			1		04/27/23 14:05		
Field Oxidation Potential	103.4	mV			1		04/27/23 14:05		
Oxygen, Dissolved	9.37	mg/L			1		04/27/23 14:05	7782-44-7	
Turbidity	0.72	NTU			1		04/27/23 14:05		
Static Water Level	786.97	feet			1		04/27/23 14:05		
Temperature, Water (C)	10.7	deg C			1		04/27/23 14:05		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	326	mg/L	20.0	8.7	1		05/01/23 10:51		
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		05/02/23 16:52		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.0	mg/L	2.0	0.43	1		05/12/23 16:59	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:59	16984-48-8	
Sulfate	1.3J	mg/L	2.0	0.44	1		05/12/23 16:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 444256

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2550653

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/09/23 08:56	

LABORATORY CONTROL SAMPLE: 2550654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550655 2550656

Parameter	Units	40261460001		2550655		2550656		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Mercury	ug/L	<0.066	5	5	5.8	5.9	115	119	85-115	3	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

QC Batch: 443628 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547530 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/11/23 17:42	
Arsenic	ug/L	<0.28	1.0	05/11/23 17:42	
Barium	ug/L	<0.70	2.3	05/11/23 17:42	
Beryllium	ug/L	<0.25	1.0	05/11/23 17:42	
Boron	ug/L	<3.0	10.0	05/11/23 17:42	
Cadmium	ug/L	<0.15	1.0	05/11/23 17:42	
Calcium	ug/L	<76.2	254	05/11/23 17:42	
Chromium	ug/L	<1.0	3.4	05/11/23 17:42	
Cobalt	ug/L	<0.12	1.0	05/11/23 17:42	
Lead	ug/L	<0.24	1.0	05/11/23 17:42	
Lithium	ug/L	<0.22	1.0	05/11/23 17:42	
Molybdenum	ug/L	<0.44	1.5	05/11/23 17:42	
Selenium	ug/L	<0.32	1.1	05/11/23 17:42	
Thallium	ug/L	<0.14	1.0	05/11/23 17:42	

LABORATORY CONTROL SAMPLE: 2547531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	250	100	80-120	
Arsenic	ug/L	250	255	102	80-120	
Barium	ug/L	250	234	94	80-120	
Beryllium	ug/L	250	233	93	80-120	
Boron	ug/L	250	220	88	80-120	
Cadmium	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	241	96	80-120	
Cobalt	ug/L	250	241	96	80-120	
Lead	ug/L	250	241	96	80-120	
Lithium	ug/L	250	237	95	80-120	
Molybdenum	ug/L	250	245	98	80-120	
Selenium	ug/L	250	257	103	80-120	
Thallium	ug/L	250	227	91	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Parameter	Units	2547532		2547533		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	0.52J	250	250	268	263	107	105	75-125	2	20		
Arsenic	ug/L	12.4	250	250	264	262	100	100	75-125	1	20		
Barium	ug/L	128	250	250	405	384	111	102	75-125	5	20		
Beryllium	ug/L	0.83J	250	250	261	259	104	103	75-125	1	20		
Boron	ug/L	43.8	250	250	309	302	106	103	75-125	2	20		
Cadmium	ug/L	0.56J	250	250	249	243	99	97	75-125	3	20		
Calcium	ug/L	147000	10000	10000	163000	156000	157	94	75-125	4	20	P6	
Chromium	ug/L	30.1	250	250	279	274	100	98	75-125	2	20		
Cobalt	ug/L	19.2	250	250	257	254	95	94	75-125	1	20		
Lead	ug/L	26.6	250	250	280	274	102	99	75-125	2	20		
Lithium	ug/L	23.9	250	250	277	276	101	101	75-125	0	20		
Molybdenum	ug/L	1.3J	250	250	246	241	98	96	75-125	2	20		
Selenium	ug/L	1.9J	250	250	267	264	106	105	75-125	1	20		
Thallium	ug/L	0.44J	250	250	250	251	100	100	75-125	0	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443675	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547666 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

QC Batch: 444310 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: 40261460001, 40261460002

METHOD BLANK: 2550800 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/12/23 14:40	
Fluoride	mg/L	<0.095	0.32	05/12/23 14:40	
Sulfate	mg/L	<0.44	2.0	05/12/23 14:40	

LABORATORY CONTROL SAMPLE: 2550801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550802 2550803

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261459001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	2.3	20	20	22.6	22.7	102	102	90-110	0	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	105	104	90-110	0	15		
Sulfate	mg/L	11.0	20	20	31.5	31.5	103	103	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.387 (0.805) C:NA T:99%	pCi/L	05/18/23 14:53	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.417 ± 0.322 (0.623) C:80% T:87%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.417 ± 0.709 (1.43)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.365 (0.772) C:NA T:95%	pCi/L	05/18/23 15:08	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.326 ± 0.316 (0.647) C:79% T:93%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.326 ± 0.681 (1.42)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585758

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: 40261460001, 40261460002

METHOD BLANK: 2845167

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.356 ± 0.319 (0.642) C:76% T:89%	pCi/L	05/15/23 15:19	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585757

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: 40261460001, 40261460002

METHOD BLANK: 2845166

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0428 ± 0.195 (0.397) C:NA T:94%	pCi/L	05/18/23 14:53	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

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

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261460001	MW-301	EPA 3010A	443628	EPA 6020B	443733
40261460002	MW-84A	EPA 3010A	443628	EPA 6020B	443733
40261460001	MW-301	EPA 7470	444256	EPA 7470	444285
40261460002	MW-84A	EPA 7470	444256	EPA 7470	444285
40261460001	MW-301				
40261460002	MW-84A				
40261460001	MW-301	EPA 903.1	585757		
40261460002	MW-84A	EPA 903.1	585757		
40261460001	MW-301	EPA 904.0	585758		
40261460002	MW-84A	EPA 904.0	585758		
40261460001	MW-301	Total Radium Calculation	589747		
40261460002	MW-84A	Total Radium Calculation	589747		
40261460001	MW-301	SM 2540C	443675		
40261460002	MW-84A	SM 2540C	443675		
40261460001	MW-301	EPA 9040	443847		
40261460002	MW-84A	EPA 9040	443847		
40261460001	MW-301	EPA 300.0	444310		
40261460002	MW-84A	EPA 300.0	444310		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Face

CHAIN-OF-CUSTODY / Analytical Request Document

40261460

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

Section A Subscribing a sample via this chain of custody constitutes acknowledgment and acceptance of the Page Terms and Conditions found at <https://info.pacelabs.com/hubs/pas-standard-larms.pdf>

Page : 1 of 1

Company	SCS ENGINEERS	Report To	Meghan Blodgett
Address	2830 Dairy Drive	Copy To	
Madison, WI 53719		Purchase Order #	
Email:	mblodgett@scsengineers.com	Project Name	25223067 Columbia CCR Background
Phone	608-216-7382	Fax	
Requested Due Date		Project #	25223067
		Attention	
		Company Name	
		Address:	
		Pace Quote	
		Pace Project Manager	dan.milwsky@pacelabs.com
		Pace Profile #:	
		Requested Analysis Filtered (Y/N)	
		Regulatory Agency	
		State / Location	

ITEM #	MATRIX	CODE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test	Residual Chlorine (Y/N)		
					START DATE	END DATE			npreserved	2SO4	NO3	HCl	NaOH	Na2S2O3			Methanol	Other
1	MMW-301	WT	WT		4/27	1220		X	X	X	X	X	X	X	X		001	
2	MMW-84A	WT	WT		4/27	1405		X	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)	
	Budget Russell	4/27	1600	See signature	4/27	0840		Y	Y	Y	
	CS Bergstrom	4/27	0840	See signature	4/27	0840		Y	Y	Y	
<p>SAMPLER NAME AND SIGNATURE</p> <p>PRINT Name of SAMPLER: Budget Russell</p> <p>SIGNATURE of SAMPLER: <i>Budget Russell</i></p> <p>DATE Signed: 4/27/2023</p>											

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SLS Engineers

WO#: **40261460**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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 - 9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 2.0

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

Person examining contents:
 Date: 4/28/23 Initials: SG
 Labeled By Initials: mt

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

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> , Pace IR, Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>002 same "1045"</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>		<u>4/28/23 SG</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: chart used white out on bottle types 4/28/23 SG

May 16, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR MOD1-3
Pace Project No.: 40261462

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay

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

Sincerely,



Tod Noltemeyer for
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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261462001	MW-302	Water	04/27/23 11:40	04/28/23 08:40
40261462002	MW-33AR	Water	04/27/23 10:30	04/28/23 08:40
40261462003	MW-34A	Water	04/26/23 10:20	04/28/23 08:40
40261462004	FIELD BLANK-MOD1-3LF	Water	04/27/23 11:00	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40261462001	MW-302	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261462002	MW-33AR	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261462003	MW-34A	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261462004	FIELD BLANK-MOD1-3LF	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Sample: MW-302 **Lab ID: 40261462001** Collected: 04/27/23 11:40 Received: 04/28/23 08:40 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	541	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 23:13	7440-42-8	
Calcium	66500	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 23:13	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.36	Std. Units			1		04/27/23 11:40		
Field Specific Conductance	605.2	umhos/cm			1		04/27/23 11:40		
Oxygen, Dissolved	10.91	mg/L			1		04/27/23 11:40	7782-44-7	
REDOX	144.7	mV			1		04/27/23 11:40		
Turbidity	1.82	NTU			1		04/27/23 11:40		
Static Water Level	786.87	feet			1		04/27/23 11:40		
Temperature, Water (C)	9.7	deg C			1		04/27/23 11:40		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	352	mg/L	20.0	8.7	1		05/01/23 10:51		
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		05/02/23 16:55		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	1.3J	mg/L	2.0	0.43	1		05/12/23 17:58	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 17:58	16984-48-8	
Sulfate	36.6	mg/L	2.0	0.44	1		05/12/23 17:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Sample: MW-33AR **Lab ID: 40261462002** Collected: 04/27/23 10:30 Received: 04/28/23 08:40 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	532	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 23:20	7440-42-8	
Calcium	55300	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 23:20	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.61	Std. Units			1		04/27/23 10:30		
Field Specific Conductance	609.3	umhos/cm			1		04/27/23 10:30		
Oxygen, Dissolved	11.71	mg/L			1		04/27/23 10:30	7782-44-7	
REDOX	176.7	mV			1		04/27/23 10:30		
Turbidity	0.20	NTU			1		04/27/23 10:30		
Static Water Level	785.79	feet			1		04/27/23 10:30		
Temperature, Water (C)	10.2	deg C			1		04/27/23 10:30		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	394	mg/L	20.0	8.7	1		05/01/23 10:52		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		05/02/23 16:56		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	19.0	mg/L	2.0	0.43	1		05/12/23 18:13	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 18:13	16984-48-8	
Sulfate	104	mg/L	10.0	2.2	5		05/15/23 11:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Sample: MW-34A **Lab ID: 40261462003** Collected: 04/26/23 10:20 Received: 04/28/23 08:40 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	220	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 23:28	7440-42-8	
Calcium	49600	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 23:28	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.53	Std. Units			1		04/26/23 10:20		
Field Specific Conductance	465.8	umhos/cm			1		04/26/23 10:20		
Oxygen, Dissolved	9.87	mg/L			1		04/26/23 10:20	7782-44-7	
REDOX	124.4	mV			1		04/26/23 10:20		
Turbidity	2.11	NTU			1		04/26/23 10:20		
Static Water Level	786.22	feet			1		04/26/23 10:20		
Temperature, Water (C)	10.9	deg C			1		04/26/23 10:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	302	mg/L	20.0	8.7	1		05/01/23 10:52		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		05/02/23 17:03		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	2.0	mg/L	2.0	0.43	1		05/12/23 18:28	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 18:28	16984-48-8	
Sulfate	48.4	mg/L	2.0	0.44	1		05/12/23 18:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

Sample: FIELD BLANK-MOD1-3LF **Lab ID: 40261462004** Collected: 04/27/23 11:00 Received: 04/28/23 08:40 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	05/02/23 05:28	05/10/23 19:48	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 19:48	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		05/01/23 10:52		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.4	Std. Units	0.10	0.010	1		05/02/23 17:16		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		05/12/23 18:43	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 18:43	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		05/12/23 18:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

QC Batch:	443772	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3010A	Analysis Description:	6020B MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

METHOD BLANK: 2547952 Matrix: Water
Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	05/10/23 19:11	
Calcium	ug/L	<76.2	254	05/10/23 19:11	

LABORATORY CONTROL SAMPLE: 2547953

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	225	90	80-120	
Calcium	ug/L	10000	9600	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547954 2547955

Parameter	Units	40261411001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	32.0	250	250	249	245	87	85	75-125	2	20	
Calcium	ug/L	91800	10000	10000	104000	105000	124	132	75-125	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD1-3
Pace Project No.: 40261462

QC Batch: 443675 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

METHOD BLANK: 2547666 Matrix: Water
Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

QC Batch:	444310	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: 40261462001, 40261462002, 40261462003, 40261462004

METHOD BLANK: 2550800 Matrix: Water
Associated Lab Samples: 40261462001, 40261462002, 40261462003, 40261462004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/12/23 14:40	
Fluoride	mg/L	<0.095	0.32	05/12/23 14:40	
Sulfate	mg/L	<0.44	2.0	05/12/23 14:40	

LABORATORY CONTROL SAMPLE: 2550801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550802 2550803

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261459001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	2.3	20	20	22.6	22.7	102	102	90-110	0	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	105	104	90-110	0	15		
Sulfate	mg/L	11.0	20	20	31.5	31.5	103	103	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 COLUMBIA CCR MOD1-3

Pace Project No.: 40261462

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR MOD1-3
Pace Project No.: 40261462

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261462001	MW-302	EPA 3010A	443772	EPA 6020B	443833
40261462002	MW-33AR	EPA 3010A	443772	EPA 6020B	443833
40261462003	MW-34A	EPA 3010A	443772	EPA 6020B	443833
40261462004	FIELD BLANK-MOD1-3LF	EPA 3010A	443772	EPA 6020B	443833
40261462001	MW-302				
40261462002	MW-33AR				
40261462003	MW-34A				
40261462001	MW-302	SM 2540C	443675		
40261462002	MW-33AR	SM 2540C	443675		
40261462003	MW-34A	SM 2540C	443675		
40261462004	FIELD BLANK-MOD1-3LF	SM 2540C	443675		
40261462001	MW-302	EPA 9040	443847		
40261462002	MW-33AR	EPA 9040	443847		
40261462003	MW-34A	EPA 9040	443847		
40261462004	FIELD BLANK-MOD1-3LF	EPA 9040	443847		
40261462001	MW-302	EPA 300.0	444310		
40261462002	MW-33AR	EPA 300.0	444310		
40261462003	MW-34A	EPA 300.0	444310		
40261462004	FIELD BLANK-MOD1-3LF	EPA 300.0	444310		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY / Analytical Request Document

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

40261462

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

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	Page: 1 Of 1
Company: SCS ENGINEERS	Report To: Meghan Blodgett	Attention:	Regulatory Agency
Address: 2830 Dairy Drive	Copy To:	Company Name:	
Madison, WI 53718		Address:	State / Location
Email: mblodgett@scsengineers.com	Purchase Order #:	Pace Quote:	
Phone: 608-216-7362 Fax:	Project Name: 25223067 Columbia CCR Mod 1-3	Pace Project Manager: dan.milewsky@pacelabs.com	WI
Requested Due Date:	Project #: 25223067	Pace Profile #: 3946-12,13	

ITEM #	SAMPLE ID <small>One Character per box. (A-Z, 0-9, /, -)</small> Sample ids must be unique	MATRIX <small>Drinking Water: DW Water: WT Waste Water: WW Product: P Soil/Solid: SL Oil: OL Wipe: WP Air: AR Other: OT Tissue: TS</small>	CODE <small>DW WT WW P SL OL WP AR OT TS</small>	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analyses Test	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)											
				MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)			START		END		Unpreserved	H2SO4	HNO3		HCl	NaOH	Na2S2O3	Methanol	Other	Metals (Bi/Ca)		TDS and pH	Metals (full list)	Radium 226	Radium 228	Chloride, Fluoride, Sulfate						
								DATE	TIME	DATE	TIME																	N	N	N	N	N	N
								DATE	TIME	DATE	TIME																	N	N	N	N	N	N
1	MW-302	WT		4/27	1145			X	X	X				X	X									001									
2	MW-33AR	WT		4/27	1030			X	X	X				X	X									002									
3	MW-34A	WT		4/26	1020			X	X	X				X	X									003									
4	FIELD BLANK-MOD1-3LF	WT		4/27	1100			X	X	X				X	X									004									
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 <small>full list metals=Sb,As,B,Be,Cs,Cd,Cr,Cu,Pb,U,Mo,Se,Tl and Hg</small>	Bridget Russell	4/27	1030				
	CS Logistics	4/28/23	0840	<i>[Signature]</i>	4/18/23	0840	22 Y Y Y


SAMPLER NAME AND SIGNATURE		TEMP in C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Bridget Russell					
SIGNATURE of SAMPLER: <i>[Signature]</i>	DATE Signed: 4/27/2023				

Sample Condition Upon Receipt Form (SCUR)

Client Name: SLS Engineers

Project #:

WO#: **40261462**



40261462

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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 - 9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 / Corr: 2.0


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

Person examining contents:
 Date: 4/28/23 Initials: SG
 Labeled By Initials: mlk

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


Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> ; Pace IR, Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W3</u>	<u>004 BP3U37D "FB MOD 1-4" 4/28/23</u> <u>004 BP3U37D "F-TU/PLK MOD1" SG</u>	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____



Appendix D

Historical Monitoring Results



Appendix E
Alternative Source Demonstrations

E1 October 2022 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration October 2022 Detection Monitoring

Dry Ash Disposal Facility, Modules 1-3
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:



SCS ENGINEERS

25223067.00 | May 31, 2023

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

Table of Contents

Section	Page
PE Certification	iii
1.0 Introduction	1
1.1 §257.94(e)(2) Alternative Source Demonstration Requirements	1
1.2 Site Information and Map	1
1.3 Statistically Significant Increases Identified	2
1.4 Overview of Alternative Source Demonstration.....	2
2.0 Background	3
2.1 Regional Geology and Hydrogeology	3
2.1.1 Regional Information.....	3
2.1.2 Site Information	3
2.2 CCR Rule Monitoring System	3
2.3 Other Monitoring Wells.....	4
3.0 Methodology and Analysis Review	4
3.1 Sampling and Field Analysis	4
3.2 Laboratory Analysis Review	4
3.3 Statistical Evaluation Review.....	5
3.4 Summary of Methodology and Analysis Review Findings	5
4.0 Alternative Sources	5
4.1 Potential Causes of SSI.....	5
4.1.1 Natural Variation	5
4.1.2 Man-Made Alternative Sources	5
4.2 Lines of Evidence	6
4.2.1 Pre-Landfill Water Quality	6
4.2.2 Long-Term Concentration Trends	7
4.2.3 Groundwater Flow Direction Changes.....	7
4.2.4 Chloride and Boron Concentrations	8
5.0 Alternative Source Demonstration Conclusions	8
6.0 Site Groundwater Monitoring Recommendations	8
7.0 References	8

Tables

Table 1.	Groundwater Analytical Results Summary – October 2022 Event
Table 2.	Historical Analytical Results for Parameters with SSIs
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network
Table 4.	Analytical Results – Lysimeters and Leachate Pond

Figures



- Figure 1. Site Location Map
- Figure 2. Site Plan and Monitoring Well Locations
- Figure 3. Water Table Map – October 2022

Appendices

- Appendix A Trend Plots for CCR Wells
- Appendix B Feasibility Study Water Quality Information
- Appendix C Long-Term Concentration Trend Plots
- Appendix D Historical Groundwater Flow Maps

I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\230531_COL_1-3 LF_Oct22 ASD_Final.docx

PE CERTIFICATION

	<p>I, Sherren Clark, hereby certify that the information in this alternative 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.</p>
	<p style="text-align: center;">  5/31/2023 </p>
	<p>(signature) (date)</p>
	<p>Sherren Clark, PE (printed or typed name)</p>
	<p>License number E-29863</p> <p>My license renewal date is July 31, 2024.</p> <p>Pages or sheets covered by this seal: Alternative Source Demonstration, October 2022 Detection Monitoring, Dry Ash Disposal Facility, Modules 1-3, Columbia Energy Center, Pardeeville, Wisconsin</p>

[This page left blank intentionally]

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*.

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 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 evaluates the SSIs observed in the statistical evaluation of the October 2022 detection monitoring event at the Columbia Energy Center (COL) Dry Ash Disposal Facility (ADF), Modules 1-3 CCR Unit. The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018). The October 2017 ASD and subsequent semiannual updates have provided several lines of evidence demonstrating that SSIs reported for boron, chloride, field pH, and sulfate concentrations in the downgradient monitoring wells were likely due to man-made sources other than the CCR Units and/or naturally occurring constituents in the alluvial aquifer.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the October 2022 monitoring event were consistent with those for the previous events.

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 ADF and the Ash Ponds Facility. This ASD will evaluate the conditions at the site for Modules 1-3 of the ADF only. The ADF is operated under the Wisconsin Department of Natural Resources (WDNR) License No. 3025.

The groundwater monitoring system monitors the following CCR Unit:

- COL Dry ADF – Modules 1-3 (existing CCR Landfill)

Modules 1-3 were originally described as separate existing CCR landfills, although they are contiguous and are managed as a single landfill by the facility and by the WDNR. Wisconsin Power and Light Company (WPL) subsequently clarified that Modules 1-3 are one existing CCR landfill under the federal CCR Rule, and this report reflects WPL's clarification.

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 as **Figure 2**. Separate monitoring systems have been established for the other CCR Units at COL, which include Modules 4-6 of the COL ADF, the primary ash pond, and the secondary ash pond.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified by comparing the monitoring results to Upper Prediction Limits (UPLs) established in accordance with 40 CFR 257.93(f)(3) and the statistical method previously selected for the CCR Unit. The UPLs are based on an interwell approach using two background monitoring wells: MW-84A and MW-301. The interwell UPLs were calculated based on a 1-of-2 resampling approach. The UPLs and results for the October 2022 monitoring event are summarized in **Table 1**.

The October 2022 SSIs include the following parameters and wells:

- Boron: MW-33AR, MW-34A, MW-302
- Chloride: MW-33AR
- Sulfate: MW-33AR, MW-34A, MW-302

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**).

The CCR Rule constituent results from background and compliance sampling for parameters with SSIs are provided in **Table 2**. The laboratory reports for the October 2022 detection monitoring event will be included in the 2023 Annual Groundwater Monitoring and Corrective Action Report to be completed in January 2024. 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

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018).

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 the uppermost aquifer, as defined under 40 CFR 257.53. 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 October 2017 ASD (SCS, 2018).

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 ADF were described as generally sandy with interbedded silty clay lenses up to 20 feet thick (Warzyn, 1978). During drilling of CCR wells MW-301 and MW-302, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously installed monitoring wells MW-33AR, MW-34A, MW-84A, and MW-1AR (abandoned) show silty sand and sand as the primary unconsolidated materials at these locations. All CCR monitoring wells are screened within the unconsolidated sand unit.

Shallow groundwater at the site generally flows to the north and west across the existing landfill Modules 1-3 area, then generally flows west toward the Wisconsin River. The groundwater flow map for October 2022 is shown on **Figure 3**. Historically, localized groundwater mounding was associated with the ash ponds, but the ash ponds are currently in the closure process. The October 2022 flow map shows temporary inward gradients in the vicinity of the Secondary Ash Pond due to dewatering activities. These temporary changes in flow do not affect groundwater flow directions in the vicinity of Mod 1-3. The groundwater elevation data for the CCR monitoring wells and state monitoring program wells are provided in **Table 3**.

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-302, MW-33AR, and MW-34A. MW-1AR was added to the monitoring program in 2021 as a supplemental well because monitoring data have indicated that the groundwater flow direction in this part of the site is sometimes to the northeast. MW-1AR was abandoned in 2022 because it was

within the footprint of the pending MOD 10-11 expansion area. The monitoring network certification was updated with the abandonment of MW-1AR in October 2022. Flow direction in this area of the site will continue to be monitored by additional wells in the State monitoring program, including new water level-only monitoring wells MW-312 and MW-93A, which will be part of the future Modules 10 and 11 monitoring well network. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 29 to 51 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 did not identify any sampling errors for field data that may have caused or contributed to observed SSIs.

The October 2022 monitoring event was completed in accordance with the Sampling and Analysis Plan for the monitoring system.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2022 detection monitoring event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for boron, chloride, or 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 analysis issues that could have caused or contributed to the observed SSIs for boron, chloride, and sulfate.

Time series plots of the SSI constituent analytical data were 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 plots are provided in **Appendix A**. The concentrations observed are similar to historical concentrations. The sulfate concentration at MW-34A was slightly higher than other recent results, but within the range of historical results (see Section 4.2.2) and does not appear to be an anomalous result due to sampling or laboratory error.

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 review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for the October 2022 detection monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2022 monitoring event based on the methodology and analysis review. No other errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, chloride, and sulfate SSIs at the downgradient monitoring wells; 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 interwell approach, comparing the October 2022 detection monitoring results to the UPLs calculated based on the sampling of the background wells (MW-84A and MW-301). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation. Previous monitoring results for boron, chloride, and sulfate at COL Modules 1-3 landfill are shown in **Table 2**.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, chloride, and sulfate SSIs.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, chloride, and sulfate SSIs could include the closed ash pond landfill, the active and inactive ash ponds, the former ash

pond effluent ditch, the coal storage area, road salt use, railroad operations, or other plant operations.

Based on the groundwater flow directions and on previous investigations at the site, the former ash pond effluent ditch appears to be the most likely cause of the boron and/or sulfate SSIs for wells MW-33AR, MW-34A, and MW-302. The ash pond effluent ditch, a non-CCR alternative source, also likely contributed to the chloride SSI at MW-33AR.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, chloride, and sulfate in compliance wells MW-33AR, MW-34A, and MW-302, relative to the background wells, are due to an alternative source include:

1. Elevated levels of boron, chloride, and sulfate were present in the area west of the landfill, where the three compliance wells are located before the landfill was constructed.
2. Monitoring performed under the state program documents that the concentrations of boron, chloride, and sulfate were elevated before CCR disposal in the landfill began, and have decreased since the landfill has been in operation.
3. Groundwater flow directions have changed through time due to changes in water management at the plant, so that groundwater impacted by the effluent ditch formerly flowed to the east, under the landfill, and is now flowing west and/or north.
4. The variations in chloride results for well MW-33AR since detection monitoring was initiated have not correlated with boron concentrations, as would be expected for a CCR leachate source; therefore, an alternative source is more likely.

4.2.1 Pre-Landfill Water Quality

Elevated levels of boron, chloride, and sulfate were present in the area west of the landfill, where the three compliance wells are located, before the landfill was constructed. Groundwater monitoring performed in 1977 and 1978 as part of the Feasibility Study for the landfill permitting showed that wells located along the west side of the future landfill footprint, where the current compliance wells are located, had elevated results for sulfate, chloride, and specific conductance. The 1978 Feasibility Study (Warzyn, 1978) for the dry ADF discusses the influence of the ash pond effluent ditch on groundwater west of the proposed site. The former ash pond effluent ditch carried effluent from the ash ponds located north of the plant, and flowed south between the west side of the current landfill and the substation. Groundwater monitoring in December 1977 indicated that sulfate was present at 1,200 milligrams per liter (mg/L) in MW-33A, which was located near the point where the ash pond effluent discharged from a culvert into the effluent ditch. The sulfate concentration at this well decreased to 830 mg/L in the December 1978 sampling (Warzyn, 1979). Current concentrations of sulfate in this area, while above background, are much lower. The October 2022 sulfate result for MW-33AR (installed to replace MW-33A) was 153 mg/L, for MW-34A was 169 mg/L, and for MW-302 was 30.3 mg/L (Table 1).

Selected text and tables from the 1978 Feasibility Study and the 1979 Supplementary Feasibility Study Report are included in **Appendix B**.

4.2.2 Long-Term Concentration Trends

Monitoring performed under the state program documents that the concentrations of boron and sulfate were elevated before CCR disposal in the landfill began, and have decreased since the landfill has been in operation. Routine groundwater monitoring for the COL ADF began after the Plan of Operation was approved and prior to initial CCR disposal. The earliest data available from the WDNR Groundwater Environmental Monitoring System (GEMS) database is from September 1984. Initial placement of CCR in test plots in Module 1 of the ADF was approved in October 1984, and CCR disposal began sometime after that. Therefore, the initial groundwater monitoring results in the GEMS database represent pre-disposal conditions for the landfill.

The earliest historic monitoring data show that before CCR disposal in the landfill began, concentrations of boron and sulfate were significantly higher than current concentrations in the area west of the landfill where the compliance wells are located. Graphs of historical concentrations are provided in **Appendix C**. Results for compliance well MW-33AR are plotted with results from well MW-33A. MW-33AR was a replacement well for MW-33A at a slightly different location and depth. The well screen was installed approximately 10 feet higher in MW-33AR than in MW-33A, intersecting the water table, which may explain the increase in concentration that occurred with the well replacement. Results for compliance well MW-302 are plotted with results from monitoring well MW-85, which was located near the current MW-302 location (see **Figure 2**) and was monitored from September 1984 through September 1995.

The recent boron concentrations are consistent with generally decreasing or stable historical concentrations at MW-33AR and MW-34A (**Appendix A** and **Appendix C**). Recent boron concentrations at MW-302 have been variable, but remain well below the concentrations observed in samples from MW-85 prior to CCR disposal in the landfill.

4.2.3 Groundwater Flow Direction Changes

Groundwater flow directions have changed through time due to changes in water management at the plant, so that groundwater impacted by the effluent ditch formerly flowed to the east, under the landfill, and is now flowing west. The 1978 Feasibility Study report states that the southern 2/3 of the proposed fill area (including the area of the active CCR landfill phases) exhibits a southeast and southerly groundwater flow direction, toward an agricultural drainage ditch southeast and south of the landfill area. The 1981 Plan of Operation indicates that flow in the landfill area is to the east-southeast. A water table map prepared by RMT, based on October 2002 water level measurements, shows flow under the landfill generally to the east and northeast from a groundwater high near the effluent ditch and Wisconsin Pollutant Discharge Elimination System (WPDES) pond between the landfill and the substation. The 1981 and 2002 water table maps are provided in **Appendix D**.

Under current conditions, groundwater flow below the active landfill area is generally to the north and northwest. The flow changes with time reflect the termination of discharge to the ash pond effluent ditch in the mid-2000s. When discharge via this ditch was active, the ditch was a source of recharge to the groundwater and created a high groundwater area with flow moving away from the ditch to the east. After discharge to the ditch was terminated, water levels in this area decreased significantly and the groundwater flow direction changed.

With the changes in groundwater flow, historically impacted groundwater moved in alternating directions. While the effluent ditch was active, impacted groundwater likely moved eastward past the current compliance wells, as indicated by the long-term concentration data. Although the compliance

wells on the west side of MOD 1-3 are downgradient from the landfill under current flow conditions, the observed groundwater impacts may be residual from the past when the wells were downgradient from the effluent ditch.

4.2.4 Chloride and Boron Concentrations

The chloride results for well MW-33AR increased beginning in 2016, peaked in April 2018 and April 2019, decreased significantly in May 2020, and have remained relatively consistent since then. A slight increase was observed in the sample collected during the April 2022 event, followed by a decrease for the October 2022 event. The 2022 concentrations were still significantly lower than the values observed in 2019 (**Table 2** and **Appendix A**). Over the same time period, boron concentrations at MW-33AR have been stable, following a long steady decreasing trend.

The lack of correlation with boron indicates the source of the increase and subsequent decrease in chloride is not likely the CCR landfill. Sampling of the landfill leachate pond and lysimeters LS-1 and LS-3R, located on the western and southern edges of MOD 1-3, indicates that boron and chloride concentrations are generally both higher than background (**Table 5**); therefore, a leachate source would tend to influence concentrations of both parameters. Furthermore, the peak chloride concentrations in the groundwater samples from MW-33AR in 2018 and 2019 exceeded the chloride concentrations measured in the leachate at that time, indicating the leachate was not the source of chloride at this location (**Table 2**, **Table 5**, and **Appendix A**). Recent samples from the leachate pond have shown increased concentrations of chloride, but this increase does not correlate with results at MW-33AR, which have decreased, or with chloride results from the lysimeters, which remain low. Based on the comparison of groundwater and leachate chloride results, an alternative man-made source, such as road salt, is a more likely source of chloride than the CCR Unit.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, chloride, and sulfate concentrations in downgradient monitoring wells MW-33AR, MW-34A, and/or MW-302 demonstrate that the SSIs are likely primarily due to sources other than the CCR Unit. Boron, sulfate, and chloride concentrations were elevated prior to disposal of CCR in the landfill and are associated with historical discharges from the ash ponds via the effluent ditch located west of the landfill. Elevated chloride concentrations detected at well MW-33AR appear likely to be related to an alternative non-CCR source, such as salt.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the COL Modules 1-3 CCR Units may continue with detection monitoring based on this ASD. The ASD report will be included in the 2023 Annual Report due January 31, 2024.

7.0 REFERENCES

SCS Engineers, 2018, Alternative Source Demonstration, October 2017 Detection Monitoring, Columbia Energy Center Dry Ash Disposal Facility, April 2018.

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., 1979, and Preliminary Engineering Concepts, Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

Tables

- 1 Groundwater Analytical Results Summary – October 2022 Event
- 2 Historical Analytical Results for Parameters with SSIs
- 3 Groundwater Elevation – State Monitoring Program and CCR Well Network
- 4 Analytical Results – Lysimeters and Leachate Pond

**Table 1. Groundwater Analytical Results Summary -
Columbia Landfill MOD 1-3 / SCS Engineers Project #25223067.00**

Parameter Name	UPL Method	UPL	Background Wells			Compliance Wells		
			MW-84A	MW-301	MW-33AR	MW-34A	MW-302	
			10/27/2022	10/27/2022	10/27/2023	10/27/2022	10/27/2022	
Appendix III								
Boron, ug/L	P	35.6	12.2	37.5	586	264	374	
Calcium, ug/L	NP	129,000	78400	62800 P6	77000	87300	91200	
Chloride, mg/L	P	6.2	3.4	2.3	40.5	2.2	2.1	
Fluoride, mg/L	DQ	DQ	<0.095	<0.095 M0	<0.095	<0.095	<0.095	
Field pH, Std. Units	P	7.78	7.31	6.80	7.54	7.53	7.25	
Sulfate, mg/L	P	30.3	1.1 J	11.6	153	169	30.3	
Total Dissolved Solids, mg/L	NP	514	302	282	440	436	348	

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 Qualification
 SSI = Statistically Significant Increase
 -- = Not Measured
 µg/L = micrograms per liter

NP = Nonparametric UPL with 1-of-2 retesting
 P = Parametric UPL with 1-of-2 retesting
 LOQ = Limit of Quantitation
 LOD = Limit of Detection
 mg/L = milligrams per liter

J = Estimated concentration at or above the LOD and below the LOQ.
 P6 = Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
 M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits

Notes:

1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background wells MW-84A and MW-301. Interwell UPLs based on 1-of-2 retesting approach. UPLs updated in January 2020 based on background well results through October 2019
3. Interwell UPLs calculated based on results from background wells MW-84 and MW-301.

Created by: <u>NDK</u>	Date: <u>5/17/2022</u>
Last revision by: <u>NLB</u>	Date: <u>4/25/2023</u>
Checked by: <u>RM</u>	Date: <u>5/1/2023</u>
Scientist/Proj Mgr QA/QC: <u>TK</u>	Date: <u>5/9/2023</u>

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Background	MW-301	12/22/2015	26.5	3.70 J	9.30
		4/5/2016	25.2	4.00	15.3
		7/8/2016	23.6	3.50 J	15.0
		10/13/2016	30.6	2.20	13.9
		12/29/2016	32.8	2.00 J	12.3 J
		1/25/2017	32.6	1.50 J	6.50
		4/11/2017	28.8	2.00	10.3
		6/6/2017	21.3	3.50	17.1
		8/8/2017	30.6	5.50	31.6
		10/23/2017	34.3	4.00	27.5
		4/25/2018	24.3	2.30	8.60
		8/8/2018	22.8	--	--
		10/22/2018	27.8	3.20	19.2
		4/3/2019	26.9	2.90 J, B	5.30 J
		10/9/2019	35.9	1.70	8.40
		5/29/2020	21.3	2.00 J	11.5 J
		10/8/2020	28.8	3.40	25.1
		4/13/2021	22.2	1.50 J	8.5
	10/14/2021	31.4	2.70	17.4	
	4/13/2022	28.7	1.90 J	12.7	
	10/27/2022	37.5	2.3	11.6	
	MW-84A	12/22/2015	11.9	4.90	4.90
		4/5/2016	14.0	4.70	4.30
		7/8/2016	14.7	5.10	3.70 J
		7/28/2016	--	--	--
		10/13/2016	11.1	4.30	2.60 J
		12/29/2016	14.7	4.70	2.70 J
		1/25/2017	16.1	4.60	3.00
		4/11/2017	12.9	4.90	2.80 J
		6/6/2017	14.8	5.50	2.70 J
		8/8/2017	22.9	5.50	2.00 J
		10/24/2017	13.8	5.10	2.20 J
		4/25/2018	25.0	4.80	2.80 J
		8/8/2018	12.8	--	--
10/22/2018		10.1 J	4.20	1.60 J	
4/3/2019		13.6	3.60 B	1.40 J	
10/9/2019		12.0	3.90	1.30 J	
5/29/2020	10.0	3.70	1.50 J		
10/8/2020	9.7 J	4.30	1.30 J		
4/13/2021	14.3	4.40	1.40 J		
10/14/2021	11.1	3.50	17.4		
4/13/2022	10.5	5.20	1.40 J, MO		
10/27/2022	12.2	3.4	1.1 J		

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Compliance	MW-302	12/22/2015	80.0	4.20	37.4
		4/5/2016	78.8	4.10	55.6
		7/7/2016	134	3.10 J	35.4
		10/13/2016	132	1.10 J	64.7
		12/29/2016	106	1.20 J	56.4
		1/25/2017	149	1.60 J	61.6
		4/11/2017	322	1.60 J	81.3
		6/6/2017	671	3.50	84.6
		8/8/2017	833	4.50	79.0
		10/24/2017	691	6.90	78.4
		4/24/2018	1,950	15.0	109
		9/21/2018	203	1.70 J	30.0
		10/22/2018	296	1.80 J	26.9
		4/2/2019	254	1.50 J	25.2
		10/9/2019	246	1.10 J	16.7
		5/29/2020	611	1.20 J	34.6
		10/8/2020	648	1.10 J	36.5
		4/13/2021	521	1.40 J	36.9
		10/14/2021	495	1.30 J	37.8
	4/12/2022	389	0.79 J	22.1 M0	
	10/27/2022	374	2.1	30.3	
	MW-33AR	12/21/2015	954	10.6	96.2
		4/5/2016	813	12.5	91.5
		7/7/2016	794	12.5	99.2
		10/13/2016	827	52.5	124
		12/29/2016	812	39.6	132
		1/25/2017	763	41.4	133
		4/11/2017	760	47.1	139
		6/6/2017	692	68.1	151
		8/7/2017	697	105	164
		10/24/2017	678	119	175
		4/24/2018	601	188	163
		9/21/2018	683	32.6	124
		10/22/2018	682	14.4	112
4/2/2019		568	229	201	
10/8/2019		548	153	182	
5/28/2020	566	15.9	104		
10/8/2020	569	27.3	97.4		
4/13/2021	473	26.9	94.3		
6/11/2021	--	--	--		
10/12/2021	564	22.6	96.4		
4/12/2022	558	59.0	155		
10/27/2022	586	40.5	153		

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Compliance	MW-34A	12/21/2015	230	4.90	69.9
		4/5/2016	220	5.10	71.6
		7/7/2016	216	5.60	63.4
		7/28/2016	--	--	--
		10/13/2016	212	6.80	54.8
		12/29/2016	224	7.10	63.9
		1/25/2017	214	7.20	71.2
		4/11/2017	214	6.20	87.6
		6/6/2017	201	7.80	106
		8/7/2017	205	7.40	105
		10/24/2017	208	7.60	98.0
		4/24/2018	209	8.20	144
		9/21/2018	241	17.1	141
		10/22/2018	233	19.9	123
		4/4/2019	204	18.7	70.4
		10/8/2019	207	57.9	39.8
		5/28/2020	210	3.90	44.4
		10/8/2020	213	2.10	58.7
		4/13/2021	203	2.30	59.3
		6/11/2022	--	--	--
	10/12/2021	212	1.90 J, M0	56.1	
	4/12/2022	237	2.20	146	
	10/27/2022	264	2.20	169	
MW-1AR ⁽²⁾	4/14/2021	16.1	1.50 J	4.40 M0	
	10/14/2021	12.4	1.20 J	3.10	

Abbreviations:

µg/L = micrograms per liter or parts per billion (ppb)

mg/l = milligrams per liter or parts per million (ppm)

J = Estimated value below the laboratory's limit of quantitation

B = Analyte was detected in the associated Method Blank.

M0 = matrix spike recovery and/or matrix spike duplicate recovery outside of laboratory control limits.

Notes:

(1) Analytical laboratory reports provided in the Annual Groundwater Monitoring and Corrective Action Reports.

(2) MW-1AR was added to the sampling network in 2021 to provide additional evaluation of site conditions in the CCR unit. MW-1AR was abandoned in March of 2022.

Created by: NDK
 Last revision by: NLB
 Scientist Check: RM

Date: 3/19/2020
 Date: 4/25/2023
 Date: 5/1/2023

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

Notes:
NM = not measured

Created by:	<u>MDB</u>	Date:	<u>5/6/2013</u>
Last revision by:	<u>NLB</u>	Date:	<u>4/25/2023</u>
Checked by:	<u>RM</u>	Date:	<u>5/1/2023</u>

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

I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Tables\[Table 3 - GW Elevations.xls]levels

**Table 4. Analytical Results - Lysimeters and Leachate Pond
Columbia Dry Ash Disposal Facility
SCS Engineers Project #25223067.00**

Monitoring Point	Monitoring Period	Monitoring Point Dry/ Broken	Boron, Total (µg/L)	Chloride, Total (mg/L)	Sulfate, Total (mg/L)
LS-1	2015-Apr	DRY	--	--	--
	2015-Oct	BROKEN	--	--	--
	2016-Apr	DRY	--	--	--
	2016-Oct	--	6,530	12.3	789
	2017-Apr	--	6,510	20.7 J	814
	2017-Oct	--	6,200	14.2 J	764
	2018-Apr	--	5,920	16.0 J	856
	2018-Oct	DRY	--	--	--
	2019-Apr	--	5,640	22.0 J	911
	2019-Oct	--	6,180	19.2 J	861
	2020-May	--	6,180	25.4 J	1,040
	2020-Oct	--	5,640	27.2 J	950
	2021-Apr	--	6,010	21.1 J	976
	2021-Oct	--	6,230	14.3 J	987
	2022-Apr	--	6,140	13.3 J	1,040
2022-Oct	--	6,000	16.7 J	898	
LS-3R	2015-Apr	--	6,480	20.6 B	807
	2015-Oct	DRY	--	--	--
	2016-Apr	DRY	--	--	--
	2016-Oct	DRY	--	--	--
	2017-Apr	DRY	--	--	--
	2017-Oct	DRY	--	--	--
	2018-Apr	DRY	--	--	--
	2018-Oct	--	6,180	26.2 J	841
	2019-Apr	DRY	--	--	--
	2019-Oct	DRY	--	--	--
	2020-May	DRY	--	--	--
	2020-Oct	DRY	--	--	--
	2021-Apr	DRY	--	--	--
	2021-Oct	DRY	--	--	--
	2022-Apr	DRY	--	--	--
2022-Oct	DRY	--	--	--	

**Table 4. Analytical Results - Lysimeters and Leachate Pond
Columbia Dry Ash Disposal Facility
SCS Engineers Project #25223067.00**

Monitoring Point	Monitoring Period	Monitoring Point Dry/ Broken	Boron, Total (µg/L)	Chloride, Total (mg/L)	Sulfate, Total (mg/L)
LP-1	2015-Apr	--	4,060	27.8	734
	2015-Oct	--	4,300	37.1	820
	2016-Apr	--	1,830	26.8	416
	2016-Oct	--	4,610	71.5	835
	2017-Apr	--	2,690	66.3	587
	2017-Oct	--	4,970	91.7	739
	2018-Apr	--	2,060	63.2	634
	2018-Oct	--	2,630	151	907
	2019-Apr	--	570	35.1	249
	2019-Oct	--	1,270	63.9	602
	2020-May	--	2,460	179	952
	2020-Oct	--	2,710	243	1,160
	2021-Apr	--	3,340	319	1,180
	2021-Oct	--	3,440	299	1,470
	2022-Apr	--	1,030	89.2	506
2022-Oct	--	2,040	175	752	

Abbreviations:

µg/L = micrograms per liter

-- = not analyzed

mg/L = milligrams per liter

Notes:

B = Analyte was detected in the associated method blank.

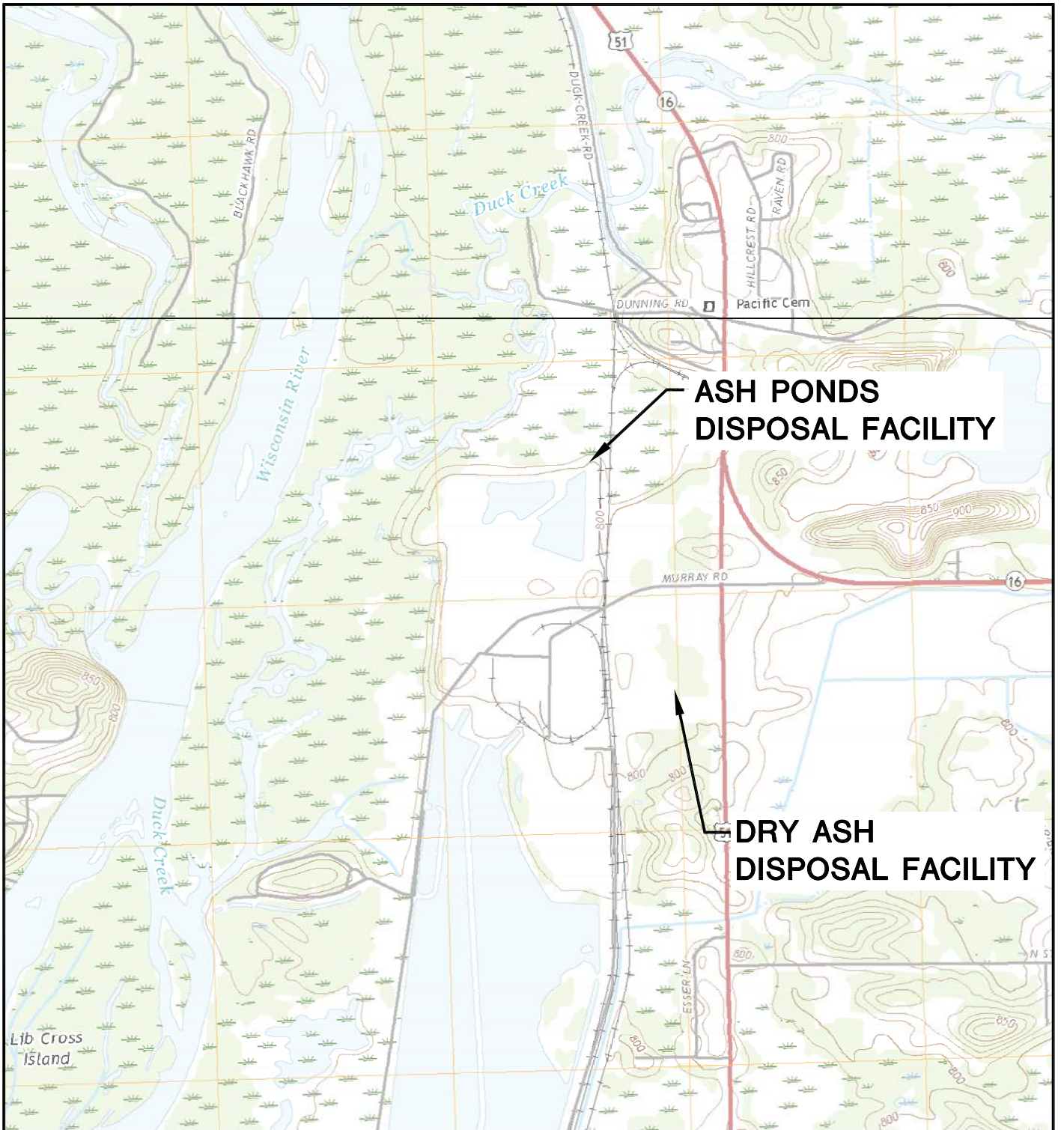
J = Estimated concentration at or above the Limit of Detection (LOD) and below the Limit of Quantitation (LOQ).

Created by: MDB
Last revision by: NLB
Checked by: RM

Date: 12/1/2014
Date: 5/1/2023
Date: 5/1/2023

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – October 2022

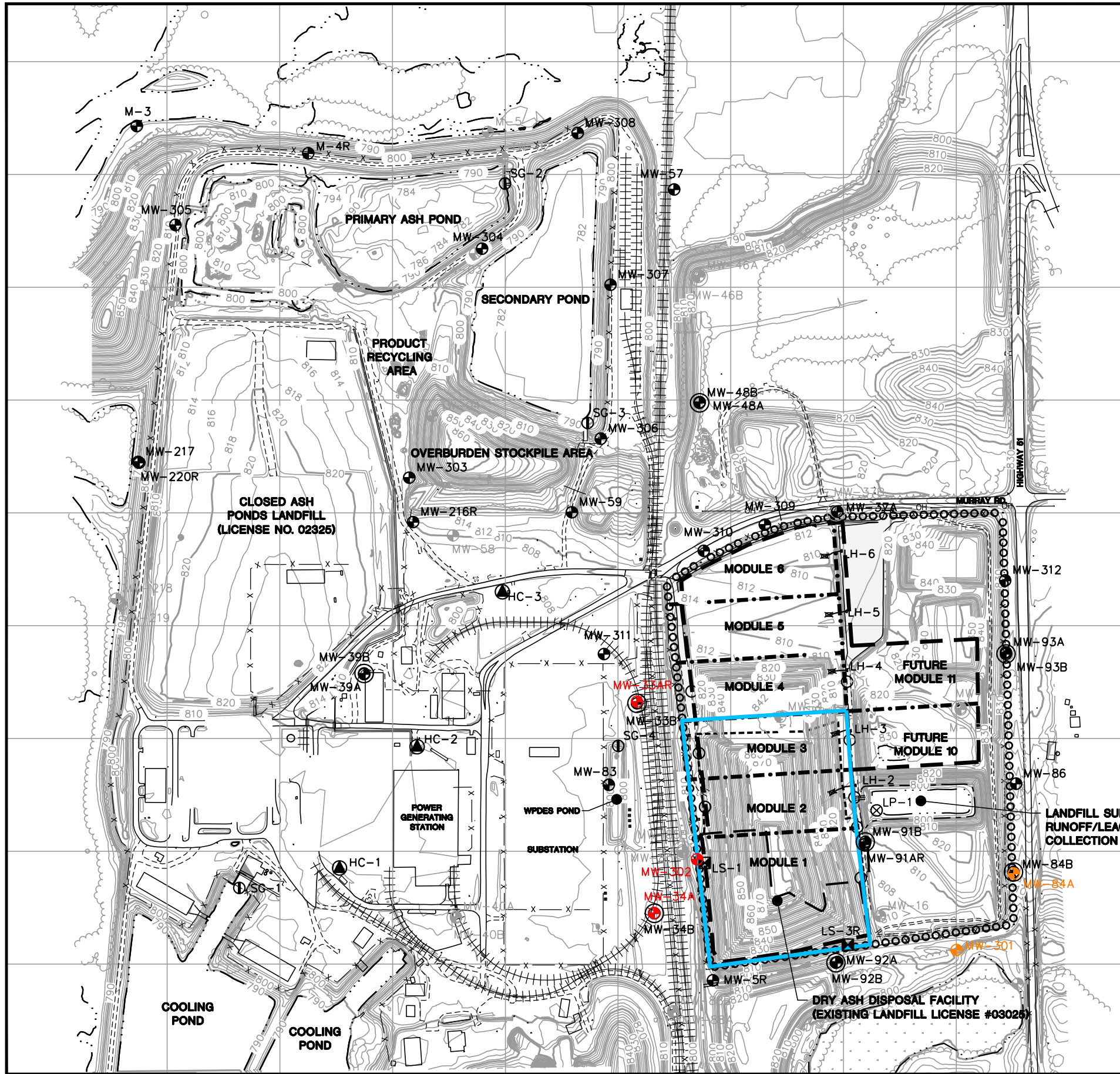


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



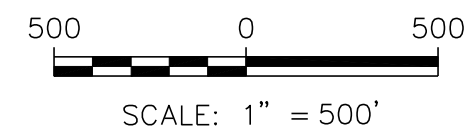
CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SITE LOCATION MAP		FIGURE 1
	PROJECT NO.	25220067.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830		
	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



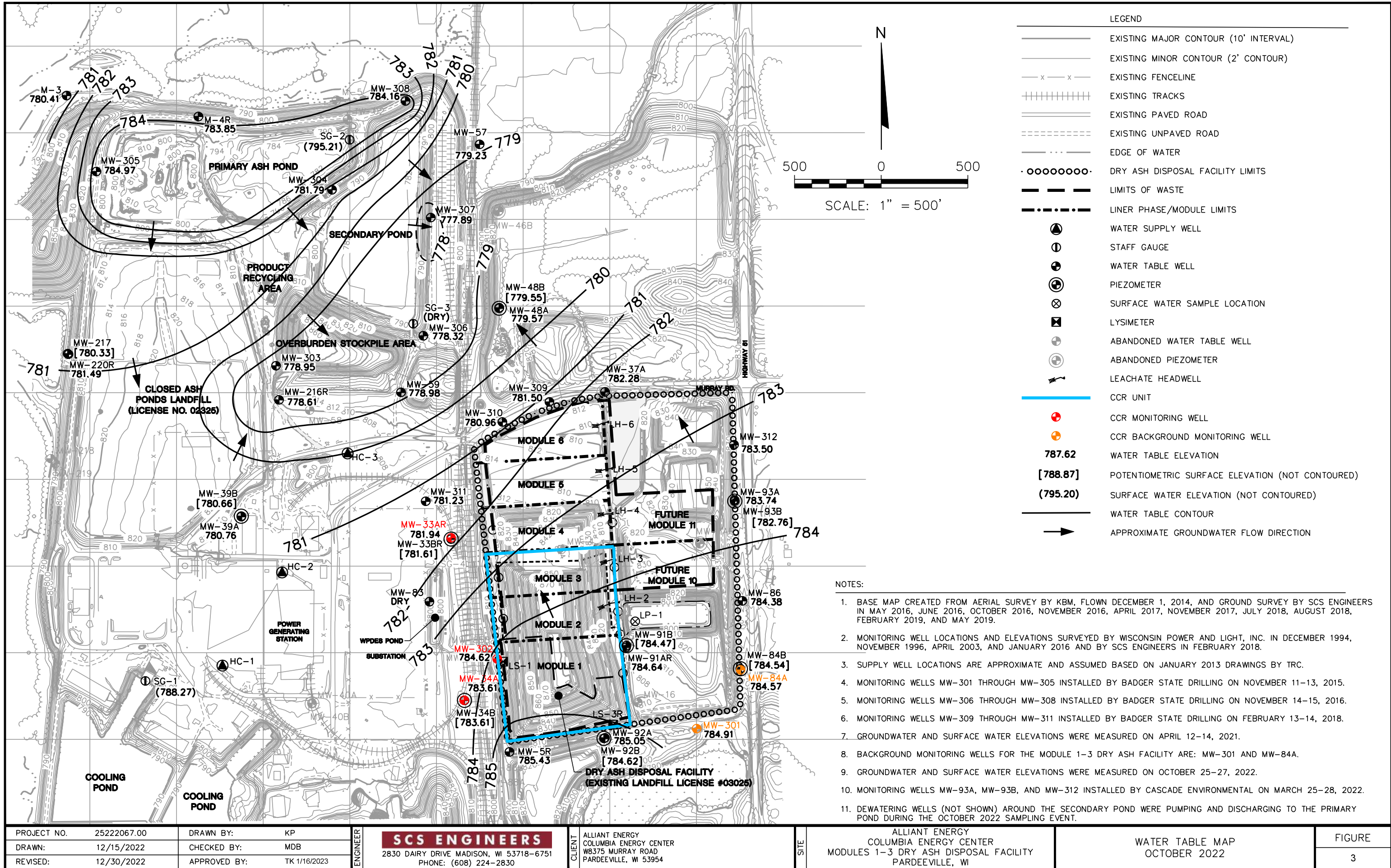
- LEGEND
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - x - x - EXISTING FENCELINE
 - ||||| EXISTING TRACKS
 - ==== EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EDGE OF WATER
 - DRY ASH DISPOSAL FACILITY LIMITS
 - LIMITS OF WASTE
 - - - LINER PHASE/MODULE LIMITS
 - ⊕ 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

- 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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
 8. BACKGROUND MONITORING WELLS FOR THE MODULE 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.



PROJECT NO. 25222067.00	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 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	FIGURE	2
DRAWN: 12/02/2019	CHECKED BY: NDK/RM								
REVISED: 01/16/2023	APPROVED BY: TK 1/16/2023								

I:\25222067.00\Drawings\Modules 1-3\Site Plan and Monitoring Well Locations.dwg, 1/16/2023 11:52:11 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
	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

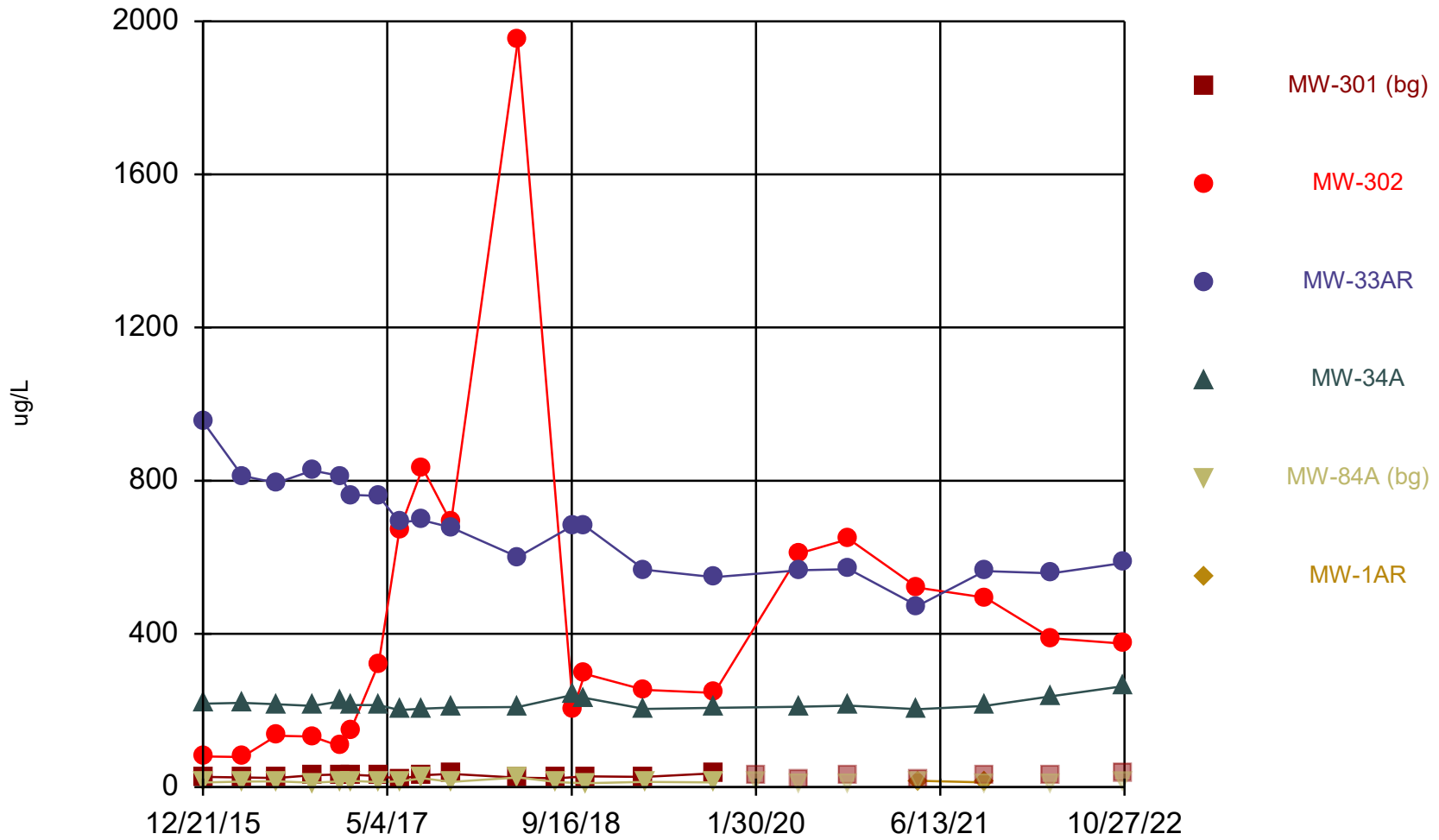
- NOTES:
1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED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

PROJECT NO. 25222067.00	DRAWN BY: KP	 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 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	WATER TABLE MAP OCTOBER 2022	FIGURE
DRAWN: 12/15/2022	CHECKED BY: MDB					3
REVISED: 12/30/2022	APPROVED BY: TK 1/16/2023					

I:\25222067.00\Drawings\Modules 1-3\Water Table Map-October 2022.dwg, 1/16/2023 12:43:58 PM

Appendix A
Trend Plots for CCR Wells

Boron



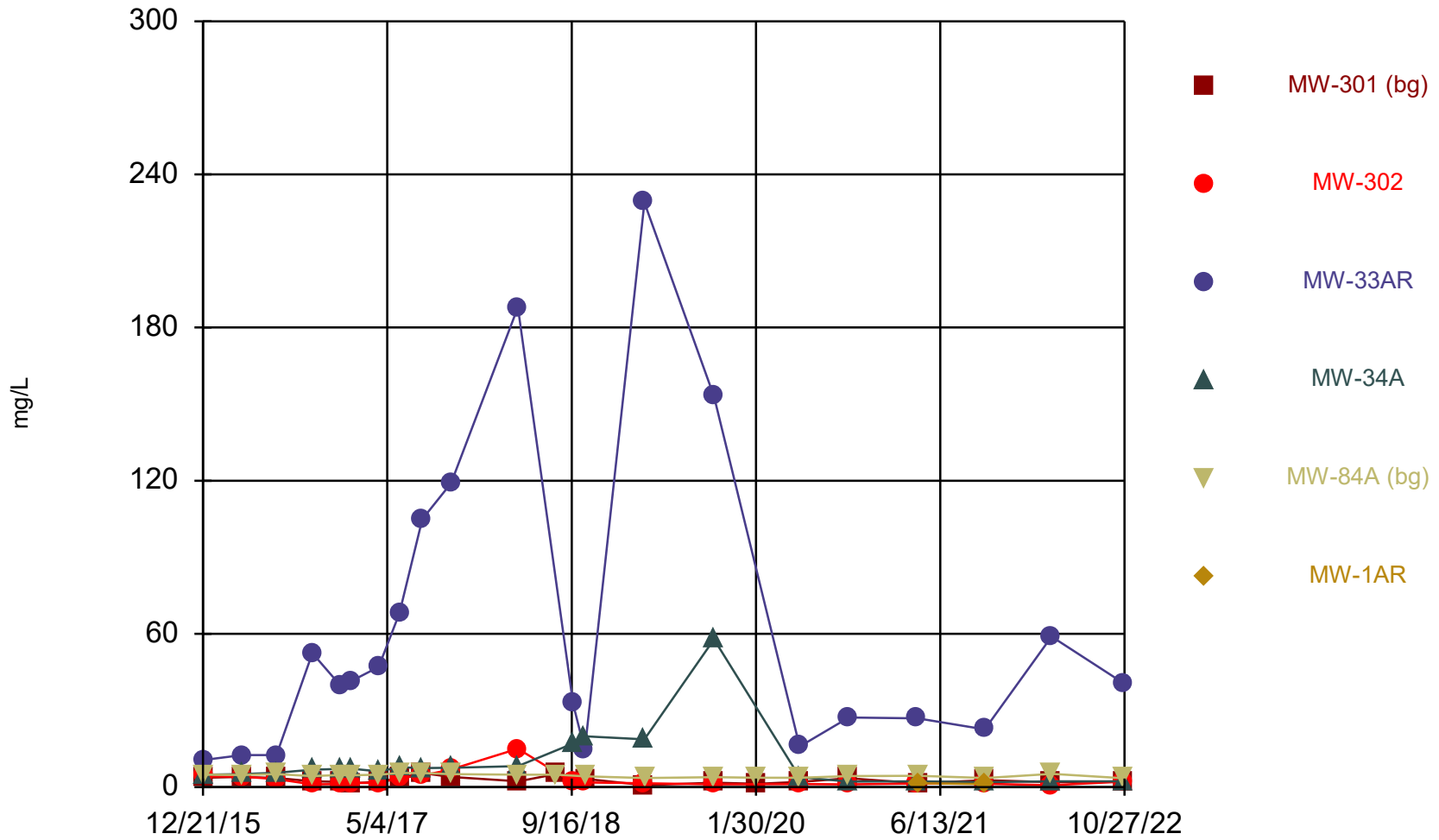
Time Series Analysis Run 5/9/2023 11:42 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 5/9/2023 11:45 AM View: COL Primary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			954	217.5 (D)		
12/22/2015	26.5	80			11.9	
4/5/2016	25.2	78.8	813	220	14	
7/7/2016		134	794	216		
7/8/2016	23.6				14.7	
10/13/2016	30.6	132	827	212	11.1	
12/29/2016	32.8	106	812	224	14.7	
1/25/2017	32.6	149	763	214	16.1	
4/11/2017	28.8	322	760	214	12.9	
6/6/2017	21.3	671	692	201	14.8	
8/7/2017			697	205		
8/8/2017	30.6	833			22.9	
10/23/2017	34.3					
10/24/2017		691	678	208	13.8	
4/24/2018		1950	601	209		
4/25/2018	24.3				25	
8/8/2018	22.8				12.8	
9/21/2018		203	683	241		
10/22/2018		296	682	233		
10/24/2018	27.8				10.1 (J)	
4/2/2019	26.9	254	568	204		
4/3/2019					13.6	
10/8/2019			548	207		
10/9/2019	35.9	246			12	
2/3/2020	27.9				15.7	
5/28/2020			566	210		
5/29/2020	21.3	611			10	
10/8/2020	28.8	648	569	213	9.7 (J)	
4/13/2021		521	473	203		
4/14/2021	22.2				14.3	16.1
10/12/2021			564	212		
10/14/2021	31.4	495			11.1	12.4
4/12/2022		389	558	237		
4/13/2022	28.7				10.5	
10/27/2022	37.5	374	586	264	12.2	

Chloride



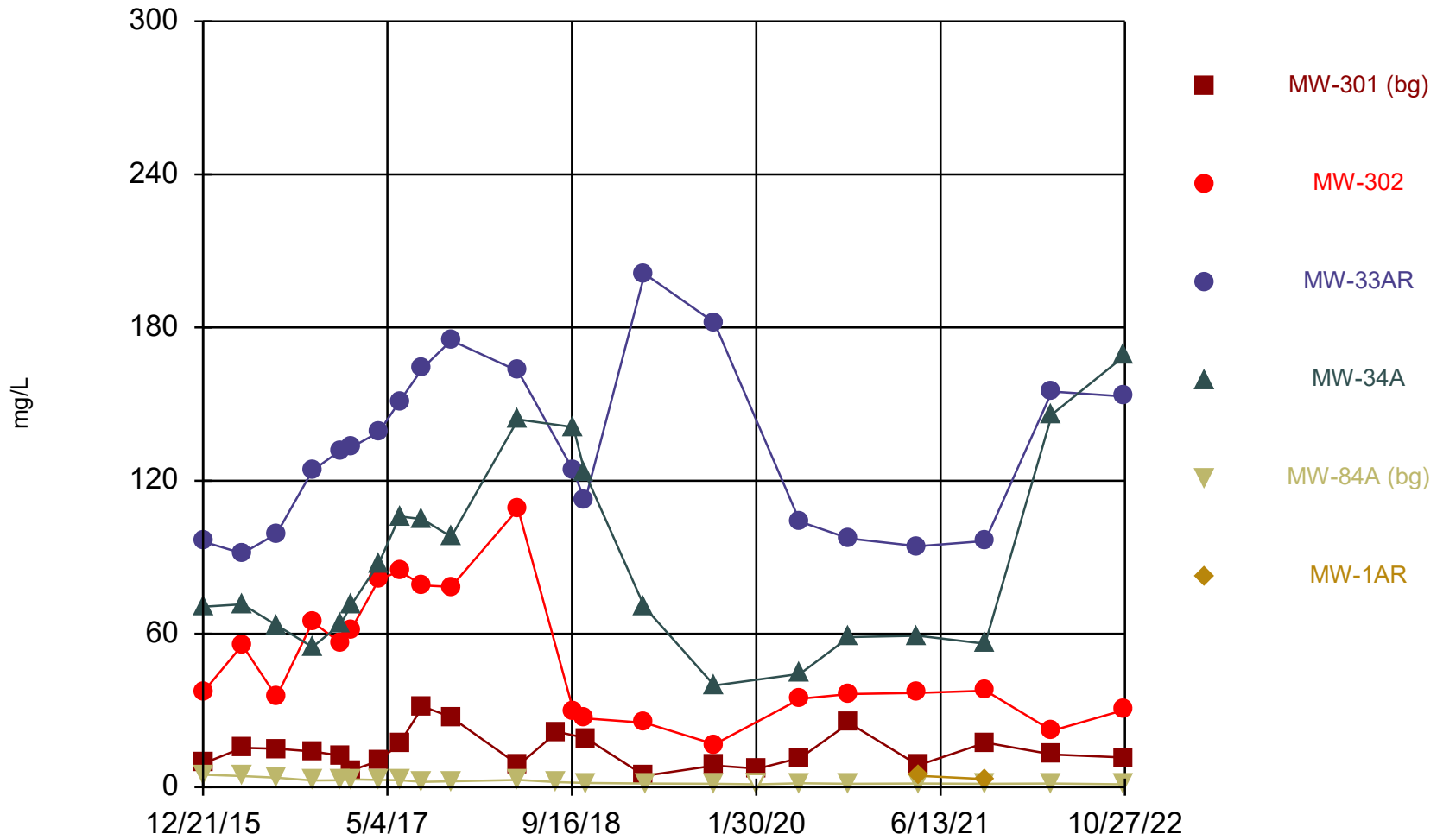
Time Series Analysis Run 5/9/2023 11:42 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Chloride (mg/L) Analysis Run 5/9/2023 11:45 AM View: COL Primary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			10.6	4.85 (D)		
12/22/2015	3.7 (J)	4.2			4.9	
4/5/2016	4	4.1	12.5	5.1	4.7	
7/7/2016		3.1 (J)	12.5	5.6		
7/8/2016	3.5 (J)				5.1	
10/13/2016	2.2	1.1 (J)	52.5	6.8	4.3	
12/29/2016	2 (J)	1.2 (J)	39.6	7.1	4.7	
1/25/2017	1.5 (J)	1.6 (J)	41.4	7.2	4.6	
4/11/2017	2	1.6 (J)	47.1	6.2	4.9	
6/6/2017	3.5	3.5	68.1	7.8	5.5	
8/7/2017			105	7.4		
8/8/2017	5.5	4.5			5.5	
10/23/2017	4					
10/24/2017		6.9	119	7.6	5.1	
4/24/2018		15	188	8.2		
4/25/2018	2.3				4.8	
8/8/2018	5.2				4.9	
9/21/2018		1.7 (J)	32.6	17.1		
10/22/2018		1.8 (J)	14.4	19.9		
10/24/2018	3.2				4.2	
4/2/2019	0.79 (J)	1.5 (J)	229	18.7		
4/3/2019					3.6	
10/8/2019			153	57.9		
10/9/2019	1.7 (J)	1.1 (J)			3.9	
2/3/2020	1.3 (J)				3.7	
5/28/2020			15.9	3.9		
5/29/2020	2 (J)	1.2 (J)			3.7	
10/8/2020	3.4	1.1 (J)	27.3	2.1	4.3	
4/13/2021		1.4 (J)	26.9	2.3		
4/14/2021	1.5 (J)				4.4	1.5 (J)
10/12/2021			22.6	1.9 (J)		
10/14/2021	2.7	1.3 (J)			3.5	1.2 (J)
4/12/2022		0.79 (J)	59	2.2		
4/13/2022	1.9 (J)				5.2	
10/27/2022	2.3	2.1	40.5	2.2	3.4	

Sulfate




Time Series Analysis Run 5/9/2023 11:42 AM View: COL Primary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 5/9/2023 11:46 AM View: COL Primary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			96.2	70.6 (D)		
12/22/2015	9.3	37.4			4.9	
4/5/2016	15.3	55.6	91.5	71.6	4.3	
7/7/2016		35.4	99.2	63.4		
7/8/2016	15				3.7 (J)	
10/13/2016	13.9	64.7	124	54.8	2.6 (J)	
12/29/2016	12.3 (J)	56.4	132	63.9	2.7 (J)	
1/25/2017	6.5	61.6	133	71.2	3	
4/11/2017	10.3	81.3	139	87.6	2.8 (J)	
6/6/2017	17.1	84.6	151	106	2.7 (J)	
8/7/2017			164	105		
8/8/2017	31.6	79			2 (J)	
10/23/2017	27.5					
10/24/2017		78.4	175	98	2.2 (J)	
4/24/2018		109	163	144		
4/25/2018	8.6				2.8 (J)	
8/8/2018	21.6				1.9 (J)	
9/21/2018		30	124	141		
10/22/2018		26.9	112	123		
10/24/2018	19.2				1.6 (J)	
4/2/2019	4.4	25.2	201	70.4		
4/3/2019					1.4 (J)	
10/8/2019			182	39.8		
10/9/2019	8.4	16.7			1.3 (J)	
2/3/2020	7.2				<2.2 (U)	
5/28/2020			104	44.4		
5/29/2020	11.5	34.6			1.5 (J)	
10/8/2020	25.1	36.5	97.4	58.7	1.3 (J)	
4/13/2021		36.9	94.3	59.3		
4/14/2021	8.5				1.4 (J)	4.4
10/12/2021			96.4	56.1		
10/14/2021	17.4	37.8			1.3 (J)	3.1
4/12/2022		22.1	155	146		
4/13/2022	12.7				1.4 (J)	
10/27/2022	11.6	30.3	153	169	1.1 (J)	



Appendix B
Feasibility Study Water Quality Information

1370



FEASIBILITY STUDY
PROPOSED FLY ASH AND/OR SCRUBBER SLUDGE
DISPOSAL FACILITY-COLUMBIA SITE
WISCONSIN POWER AND LIGHT COMPANY
TOWN OF PACIFIC, COLUMBIA COUNTY, WISCONSIN

Jan 78

C 7134

conceivable that groundwater flow in the area north of Murray Road may be altered such that contaminants derived from the present ash settling basin might be diverted southerly towards the homes along Murray Road. These questions would have to be addressed in greater detail, consistent with the goals of Wisconsin Power and Light Company.

WATER QUALITY

During the first two weeks of December, 1977, 64 water samples were obtained from surface waters and groundwater monitoring wells at the Columbia Energy Center. The purpose of the sampling was to assess background water quality in the vicinity of the proposed disposal site. The sampling stations included 59 monitoring wells, the cooling lake, ash settling pond, the drainage ditch carrying the ash pond discharge waters and the agricultural drainage ditch along the southern boundary of the site. Due to the large number of sampling stations, the analyses were limited to pH, specific conductance, iron, calcium, magnesium, sulfate and chloride. The analytical data is contained in Appendix F and is discussed below.

pH

Most groundwaters found in the United States have pH values ranging from around 6.0 to 8.5. The pH of a water represents the result of a number of interrelated chemical equilibria. This equilibria can be altered shortly after sampling by gains or losses of carbon dioxide, the oxidation of ferrous iron and numerous other chemical reactions. Thus, pH measurements must be taken shortly after obtaining the sample. For this study, the pH of samples was determined immediately upon return to the laboratory.

Within the proposed site boundaries at the Columbia Energy Center, pH values ranged between 6.3 and 8.1 and averaged 7.5. Typically, the lower pH values were observed in the lowland areas and wetlands, probably as a result of acidic organic soils. The pH of water in the ash disposal settling pond and the cooling lake was 11.4 and 8.3, respectively.

SPECIFIC CONDUCTANCE

Specific conductance, or conductivity, is the ability of a substance to conduct an electric current. The conductance determination is correlative with the dissolved-solids concentration. Conductivity, however, is temperature dependent and thus requires the reference of specific conductance measurements to a standard temperature. The values discussed here are referred to 25°C.

The specific conductance of groundwater in the study area ranged from 220 umhos/cm to a maximum of 2600 umhos/cm. The highest conductivity readings were observed in monitoring wells located along the coal storage area and the drainage ditch carrying the ash pond discharge where values up to 2600 umhos/cm were measured. The conductivity of the ash pond effluent was 1380 umhos/cm. This data appears to confirm earlier speculation of infiltration of effluent from the ash pond discharge channel and from the coal storage area into the groundwater. Conductance within the proposed site boundaries averaged approximately 465 umhos/cm.

Conductivity in the ash disposal settling pond was measured at 1510 umhos/cm. Shallow monitoring wells M-6 and 39A, located adjacent to the pond also exhibited elevated values of 1160 umhos/cm and 1800 umhos/cm, respectively.

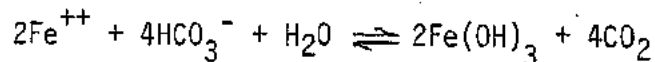
High conductivities were also observed along U. S. Highway 51 at monitoring wells 51A and 51B. The chloride data, discussed below, indicates infiltration of road salt has probably occurred at this location.

Specific conductance measurements obtained in the vicinity of the proposed disposal site are shown on Drawing C 7134-15.

IRON

The element iron is an abundant element found in most rocks and soil. It generally occurs as sulfides and oxides in igneous and metamorphic rocks and as iron oxide and hydroxide cementing materials in coarse-grained sedimentary rocks.

Ferrous iron is unstable in the presence of oxygen where it is bound to hydroxide anions as $2\text{Fe}(\text{OH})_3$.



If subjected to a strong reducing environment, such as a marsh, the reaction is reversed and iron goes back into solution. The amount which dissolves is related to a number of variables including the velocity with which water moves through this environment.

The U. S. Public Health Service recommends an iron concentration of less than 0.3 mg/l in water used for drinking and culinary purposes. Laundry and porcelain tend to be stained when concentrations reach 0.5 to 1.0 mg/l. At this level it can also be tasted.

The presence of iron under the proposed disposal area in the majority of cases was below the detection limit of 0.1 mg/l. In monitoring wells 5 and 18, located in or near the central marsh area, iron increased to 10 mg/l and 5.7 mg/l, respectively. In the southern marsh, monitoring wells exhibited concentrations between 0.5 mg/l and 6.1 mg/l. Although the iron concentration in the cooling lake was below the detection limit, down-gradient wells 44 and 30A located on the cooling lake dike yielded values of 11 mg/l and 26 mg/l iron respectively. Boring logs indicated trace amounts of organic material at the base of the dike which is probably the reason for the high concentrations observed. At the same location, iron in well 30B installed to a depth of 100 feet below the surface was below 0.1 mg/l. Thus, the occurrence of high iron concentrations in this area appears restricted to groundwater in the upper portion of the aquifer where organic material is present and conditions are favorable for the dissolution of iron.

The ash pond discharge in the drainage ditch paralleling the west site boundary showed an iron concentration of 3.7 mg/l. Shallow monitoring wells 33A and 34A adjacent to the ditch indicated less than 0.1 mg/l iron.

North of Murray Road the iron concentration in monitoring wells in the marsh and uplands were typically less than 0.1 mg/l. Although the ash basin had less than 0.1 mg/l iron, several wells along cross-section F-F' showed anomalously high values (#M6-2.3 mg/l; #47-16 mg/l; #51B-21 mg/l).

CALCIUM

Calcium, because of its relative abundance and mobility, is the principle cation in most natural fresh water. Calcium is a constituent of many rock types but is found in greatest quantities in waters leaching deposits of limestone and dolomite. In sandstone and other detrital rock, calcium carbonate is a common cement between grains.

Monitoring wells located within the site boundaries exhibited calcium concentrations between 30 mg/l and 66 mg/l and averaged about 42 mg/l. Similar to iron, the concentrations of calcium in monitoring wells along cross-section F-F' were anomalously high, up to 150 mg/l calcium. Water table wells along the drainage ditch carrying the ash pond discharge averaged 83 mg/l while the ash pond effluent contained 28 mg/l. Generally the amount of calcium in groundwater decreased with depth. Nested monitoring wells typically showed somewhat lower concentrations of calcium in the deeper wells.

MAGNESIUM

As a relatively abundant element on the earth's crust, the principle sources of magnesium in natural waters are considered to be ferromagnesian minerals in igneous rocks and magnesium carbonate in carbonate rocks (limestone and dolomite). Waters in which magnesium is the predominant cation are somewhat unusual. Like calcium, magnesium imparts the property of hardness to water and is, therefore, of concern to industrial users.

Generally, concentrations of magnesium were 1/3 to 1/2 of the calcium levels. Magnesium concentrations within the site boundaries ranged between 10 mg/l and 36 mg/l and averaged 27 mg/l. Similar to calcium and iron, higher magnesium values were observed, in general, north of Murray Road and especially in monitoring wells along cross-section F-F'.



SULFATE

Sulphur is widely distributed in reduced form in both igneous and sedimentary rocks as metallic sulfides and when present in sufficient concentrations, constitutes ore of economic importance. During weathering processes with aerated water, the sulfides are oxidized to sulfate ions and are dissolved into water. Pyrite (FeS_2) crystals often occur in sedimentary rocks and are particularly associated with biogenic deposits such as coal which were deposited under strongly reducing conditions.

The concentrations of sulfate in groundwater in the vicinity of the proposed disposal site ranged from less than 1 mg./l to 1,200 mg./l of sulfate. (Refer to Drawing C 7134-15.) Typically, within the site boundaries concentrations averaged approximately 12 mg./l. Near the coal storage area, however, significant increases were observed. Observation wells 26A, 26B, and 42 exhibited concentrations between 900 and 1100 mg./l. The depth of sulfate enrichment in groundwater, near the coal pile, appears to extend to considerable depths, indicated by relatively high sulfate concentrations in Well 26B sealed 100 feet below ground surface. The oxidation of pyrite minerals in the coal leaching into the groundwater is probably the major source of the high concentrations observed.

Sulfate concentrations in the ash disposal settling pond were 520 mg./l. In the ditch carrying the ash pond discharge, the effluent is treated with sulfuric acid which results in precipitation of barium sulfate and aluminum hydroxide (personal communication, Merlin Horn, 1978). Consequently, the sulfate concentration of the effluent waters is lowered considerably to 13 mg./l. Well 33A, however, located near the point of effluent discharge, exhibited 1200 mg./l sulfates.

CHLORIDE

Chloride is generally present in much lower concentrations in rocks than many of the other major constituents of natural water. Important sources, however, are associated with sedimentary rocks, particularly the evaporites. The chemical behavior of chloride in natural water is relatively inert compared to the other major ions. There are few oxidation-reduction reactions and no significant chemical complexing reactions which chloride enters into. In addition, chloride ions are not significantly adsorbed on mineral surfaces. For these reasons, chloride is commonly used as a tracer in groundwater.

Chloride concentrations in groundwater in the vicinity of the Columbia Energy Center typically range between 0.5 mg./l and 30 mg./l. The highest concentrations in monitoring wells tended to be located adjacent to U. S. Highway 51 where the use of road salt has resulted in the percolation of chloride into the groundwater. Monitoring Wells 51A and 51B located in a low area north of Murray Road along U. S. Highway 51, yielded chloride concentrations in excess of 200 mg./l. Two other wells, 52A and 19, also located along U. S. Highway 51, yielded values of 30 mg./l and 42.5 mg./l chloride, respectively.

Within the proposed site boundaries, the chloride concentration averaged 7.7 mg./l. Excluding the few wells adjacent to U. S. Highway 51 exhibiting elevated concentrations, no other significant trends in the occurrence of chloride were observed.

SUMMARY

In summary, the groundwater in the vicinity of the proposed disposal site exhibited a somewhat alkaline pH. In lowland areas, the pH was typically below 7.0, probably a result of the presence of acidic organic soils.

Specific conductance within the proposed site averaged 465 umhos/cm. Conductivities up to 2600 umhos/cm were observed, however, in the vicinity of the coal storage area, the present ash disposal pond and ash pond effluent channel where infiltration of water from these sources is occurring into the groundwater system.

The groundwater typically exhibited relatively low iron concentrations although, locally, concentrations in excess of drinking water standards were observed in about 20% of the wells. The occurrence of the higher iron concentrations appears to be related to the presence of organic soils.

Groundwater at the proposed site also tended to exhibit high calculated hardness (216 mg./l) based on average observed values for calcium (42 mg./l) and magnesium (27 mg./l). Dissolution of limestone and dolomite rocks in the glacial drift are the probable sources of these elements in the groundwater.

Enrichment of sulfate in groundwater has occurred as a result of leaching of pyrite (FeS_2) minerals from the coal storage area where concentrations up to 1200 mg./l were observed. The depth of this enrichment appears to extend beyond the maximum depth into the aquifer investigated. Sulfate concentrations decreased rapidly away from the coal storage area to an average of 12 mg./l within the proposed site boundaries. Other local sources of sulfate in groundwater appear to be related to the present ash settling pond.

The concentration of chloride within the proposed site averaged 7.1 mg./l. Higher levels were generally observed in wells adjacent to U. S. Highway 51 where the infiltration of road salt has locally raised chloride concentrations.

The above interpretations are based on one round of water quality sampling only and should be considered as preliminary in nature. High sulfate and chloride concentrations observed at greater depths may be a temporary condition resulting from contamination of spoil backfill materials with coal dust or salt, respectively, during installation of the monitoring well. Future sampling of these monitoring wells will help to distinguish short term contamination from actual conditions existing in the aquifer.

APPENDIX F
WATER QUALITY DATA

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)
1A	7.6	550	17.	6.5	52	37	<0.1
1B	8.05	460	16.	10.5	39	31	<0.1
2	7.8	527	14.	2.5	45	32	<0.1
3A	7.5	548	13.	2.5	58	36	<0.1
3B	8.1	506	14.	7.0	50	34	<0.1
4	7.8	580	10.	4.0	59	34	<0.1
5	6.3	560	210.	12.5	13	29	10
16	7.6	408	12.	1.5	42	28	<0.1
17	6.45	350	30.	16.5	16	13	0.6
18	6.45	380	4.	4.5	33	22	5.7
19	7.9	570	10.	42.5	44	24	<0.1
20	8.0	340	10.	5.0	36	24	<0.1
21	6.9	220	20.	4.5	23	10	0.1
24A	7.45	775	18.	6.0	76	52	0.1
24B	7.85	440	15.	6.0	43	31	0.1
25	8.1	300	10.	2.5	29	20	<0.1
26A	7.2	2100	900	17.0	140	48	1.5
26B	7.5	2600	1100	16.5	43	7.0	0.2
27	7.15	400	6.	8.0	23	18	<0.1
28A	7.75	500	3.	0.5	48	31	<0.1
28B	7.6	480	4.	3.5	39	28	<0.1
29A	7.8	330	16.	1.5	33	21	0.5
30A	6.75	920	64.	11.0	38	30	26
30B	7.6	770	210	21.0	37	19	<0.1
33A	8.2	2500	1200	24.0	83	50	<0.1
33B	7.9	390	22.	6.5	31	27	0.2
34A	7.7	680	140.	10.0	58	45	0.1
34B	7.7	1700	660	15.0	48	22	<0.1
35	6.8	740	<1.0	4.0	66	33	2.9
36	6.8	740	<1.0	3.5	53	35	6.1
37A	7.7	460	9.	4.0	48	31	0.8
37B	7.5	630	73.	7.5	71	35	<0.1
39A	7.5	1800	350	22.0	180	100	0.1
39B	7.9	330	560	20.5	31	22	0.1
40A	8.0	630	140	8.5	43	29	<0.1
40B	8.1	330	17.	3.0	31	22	<0.1
41	6.8	590	16.	11.0	58	27	9.3

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)
42	7.4	2400	900	17.5	50	12	0.5
44	6.9	490	<1.	16.5	39	23	11
45	7.6	390	14.	3.0	40	25	<0.1
46A	7.3	1100	21.	15.5	140	82	<0.1
46B	7.8	470	25.	17.5	40	26	<0.1
47	6.6	1200	3.	8.0	140	40	16
48A	7.3	620	15.	8.0	62	37	<0.1
48B	7.1	520	22.	20.0	43	29	0.2
49	7.15	730	6.	3.5	75	41	<0.1
50A	7.6	520	28.	15.5	51	34	<0.1
50B	7.5	410	21.	18.0	31	21	<0.1
51A	6.1	1850	8.	205.	65	40	<0.1
51B	7.2	1250	23.	275.	57	36	21
52A	7.7	450	16.	30.5	36	17	<0.1
52B	7.4	430	40.	17.5	32	20	<0.1
53	7.75	450	27.	10.5	39	28	<0.1
54A	7.8	350	12.	4.0	34	21	0.1
54B	7.55	390	15.	5.5	40	24	0.1
55B	7.9	340	23.	17.5	32	22	0.1
56	7.8	450	22.	9.5	43	28	0.1
57	7.85	380	17.	7.0	38	24	0.1
M-6	7.0	1160	5.	7.0	150	91	2.3
Cooling Lake	8.3	370	31.	18.0	34	21	<0.1
Ash Pond Effluent	7.45	1380	13.	4.0	28	1.2	3.7
Ash Pond Drainage	11.4	1510	520.	23.5	29	0.2	<0.1
Ditch (A) Drainage	7.8	500	21.	7.0	43	29	<0.1
Ditch (B)	9.05	1780	750	14.0	42	5.4	<0.1

DEC 19 1979

APPENDICES TO

SUPPLEMENTARY FEASIBILITY STUDY REPORT
AND PRELIMINARY ENGINEERING CONCEPTS
COLUMBIA SITE
WISCONSIN POWER AND LIGHT COMPANY
TOWN OF PACIFIC, COLUMBIA COUNTY, WISCONSIN

D. N. R. APPROVED
DATE 9/3/80
Nile Ostenso, Hydro



APPENDIX I

WATER QUALITY DATA - DECEMBER 1978



WATER QUALITY DATA


12/78

C 7134

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
1A	7.3	530	30	3.1	54	35	<0.1	-
1B	7.0	470	67	6.1	49	30	<0.1	-
2	7.25	458	91	<.5	48	24	<0.1	-
3A	7.0	560	36	<.5	61	31	<0.1	-
3B	7.15	530	52	35.7	37	33	<0.1	-
4	7.2	750	69	5.8	49	30	<0.1	-
5	6.35	1,650	670	14.1	14	13	1.7	-
16	6.9	390	69	1.0	49	23	<0.1	-
17	5.55	295	57	16.3	14	8.6	0.2	-
18	5.9	430	10	4.2	47	21	1.1	-
19	7.4	765	75	4.2	51	28	<0.1	-
20	7.4	380	26	1.6	39	26	<0.1	-
21	5.7	250	54	10.4	15	8.3	0.2	-
24A	7.2	730	36	1.6	65	42	<0.1	-
24B	7.2	470	10	7.3	42	28	<0.1	-
25	7.0	335	29	7.8	39	21	0.2	-
26A	7.4	2,250	650	12.6	32	8.6	<0.1	-
26B	6.8	2,530	840	20.8	49	18	<0.1	-
27	6.9	410	24	4.2	40	24	0.4	-
28A	7.2	500	61	0.5	45	28	<0.1	-
28B	7.0	465	6	2.1	39	26	0.1	-
29A	7.1	410	24	3.6	31	22	0.1	-
30A	5.8	1,140	15	<0.5	97	56	38	-
30B	6.65	835	160	14.6	37	20	<0.1	-
33A	7.8	1,970	830	16.7	21	8.9	<0.1	-
33B	7.5	380	31	7.3	24	27	<0.1	-
34A	7.25	560	46	4.2	53	33	<0.1	-
34B	8.5	1,575	730	21.9	28	29	0.1	-
35	6.7	545	61	3.6	60	26	1.0	-
36	6.4	515	5.0	2.6	43	24	4.8	-
37A	7.05	438	30	3.7	50	28	<0.1	-
37B	6.7	325	18	7.3	1.0	0.5	<0.1	-
39A	6.35	1,260	33	13.6	70	7.6	0.1	-
39B	6.7	385	25	4.2	30	21	<0.1	<.05
40A	7.35	483	40	<0.5	48	24	<0.1	-
40B	7.25	343	4	4.2	21	14	<0.1	-
41	6.1	640	54	19.8	43	32	<0.1	-

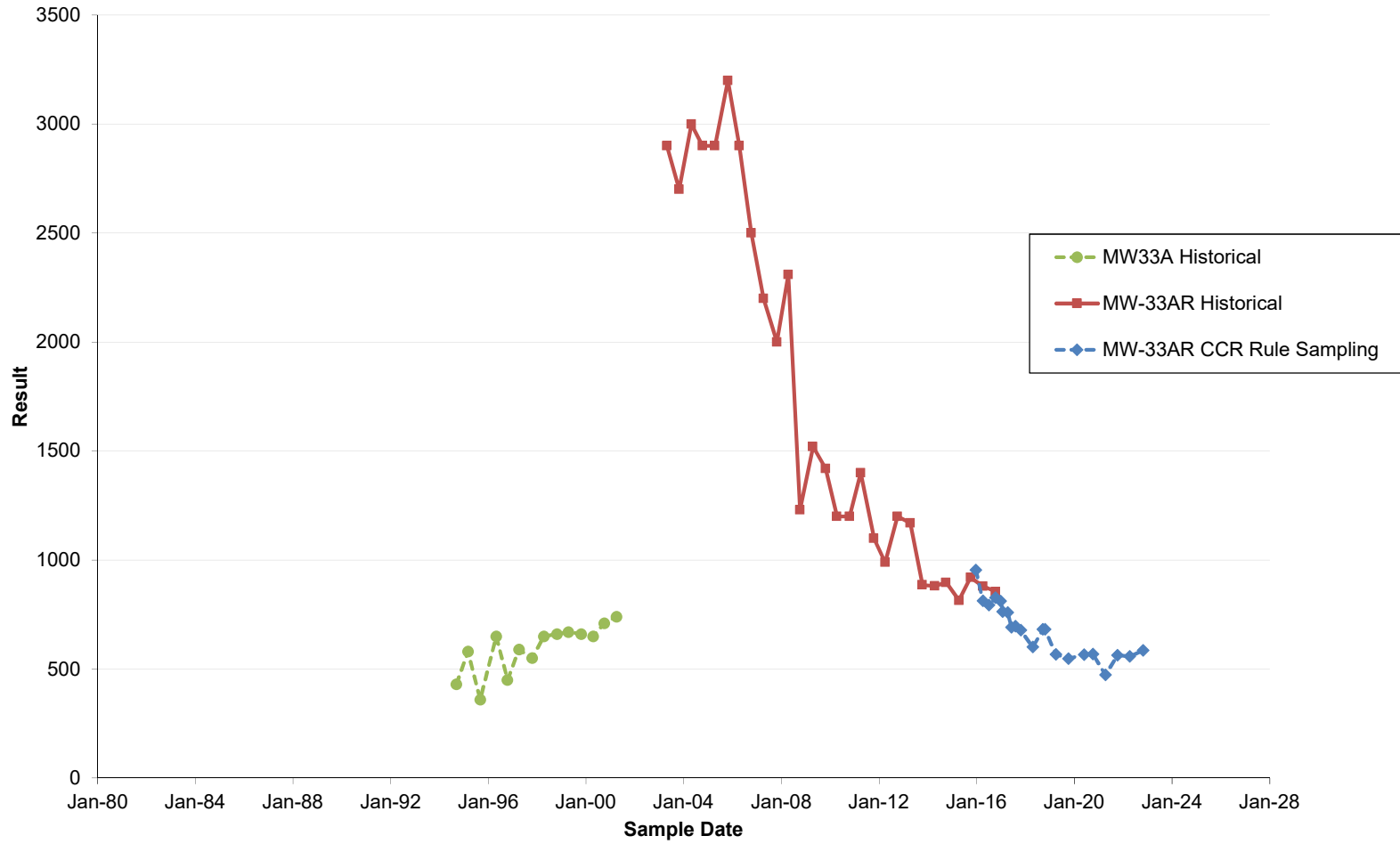
WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
42	7.15	2,050	910	15.6	23	7.5	0.1	-
44	6.15	710	6	0.5	56	27	3.5	-
45	7.2	420	32	1.0	44	26	<0.1	-
46A	7.0	560	93	<0.5	130	75	<0.1	<0.05
46B	6.5	1,290	170	20.8	46	30	<0.1	<0.05
47	7.3	958	120	<0.5	110	48	<0.1	-
48A	6.15	640	59	<0.5	42	51	<0.1	<0.05
48B	6.8	450	23	5.2	40	27	<0.1	<0.05
49	7.0	880	26	2.1	93	58	0.1	-
50A	7.4	660	25	17.7	60	36	<0.1	-
50B	7.1	405	16	17.7	38	23	<0.1	-
51A	7.0	1,170	57	135	66	31	<0.1	-
51B	7.3	1,410	22	330	46	39	<0.1	-
52A	7.0	370	110	18.5	35	10	<0.1	-
52B	7.0	595	43	52.5			0.1	-
53	Frozen							
54A	7.5	345	10	1.0	36	22	<0.1	<0.05
54B	Frozen							
55B	7.3	505	26	15.6	52	29	<0.1	<0.05
56	Frozen							
57	Frozen							
M-6								
58	6.55	1,265	140	<0.5	110	65	0.1	-
59	6.8	925	40	<0.5	86	60	<0.1	-
60	7.2	1,510	54	4.7	130	85	<0.1	-
61A	6.85	590	39	30.2	58	31	<0.1	-
61B	7.2	505	6	13.5	48	29	<0.1	-
62	6.7	1,517	72	178	120	53	<0.1	-
64	6.9	670	100	26.8	63	36	0.8	-
65	7.2	830	57	17.8	78	50	<0.1	-
66	6.5	680	55	40	66	24	3.6	-

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
67	7.0	560	100	1.0	57	32	1.0	-
68A	7.6	440	32	2.1	40	27	<0.1	-
68B	7.2	400	36	1.0	42	25	<0.1	-
70A	7.5	440	20	<0.5	27	37	<0.1	-
70B	7.3	520	25	5.2	51	34	<0.1	-
72AZ	6.45	860	11	<0.5	100	41	1.8	-
72B	8.4	230	45	<0.5	17	19	<0.1	-
M-4	7.6	864	180	26.1	20	11	<0.1	0.39
MM-4			2	2.6	14	21	0.9	-
Cooling Lake at 1	7.7	355	36	13.6	31	21.2	<0.1	-
Ash Pond at 2	11.4	3,210	1,100	22.9	34	<0.1	<0.1	-
Ash Pond at 3	8.7	725	34	21.9	48	16	<0.1	-
Ash Pond Effluent at 4	6.7	3,090	1,400	25.0	39	0.4	<0.1	-
Drainage Ditch at 5	7.2	730	74	33.9	56	38	<0.1	-
Drainage Ditch at 6	7.35	2,750	640	18.8	34	7.5	<0.1	-
Drainage Ditch at 7	8.05	1,780	740	27.1	31	0.2	<0.1	-



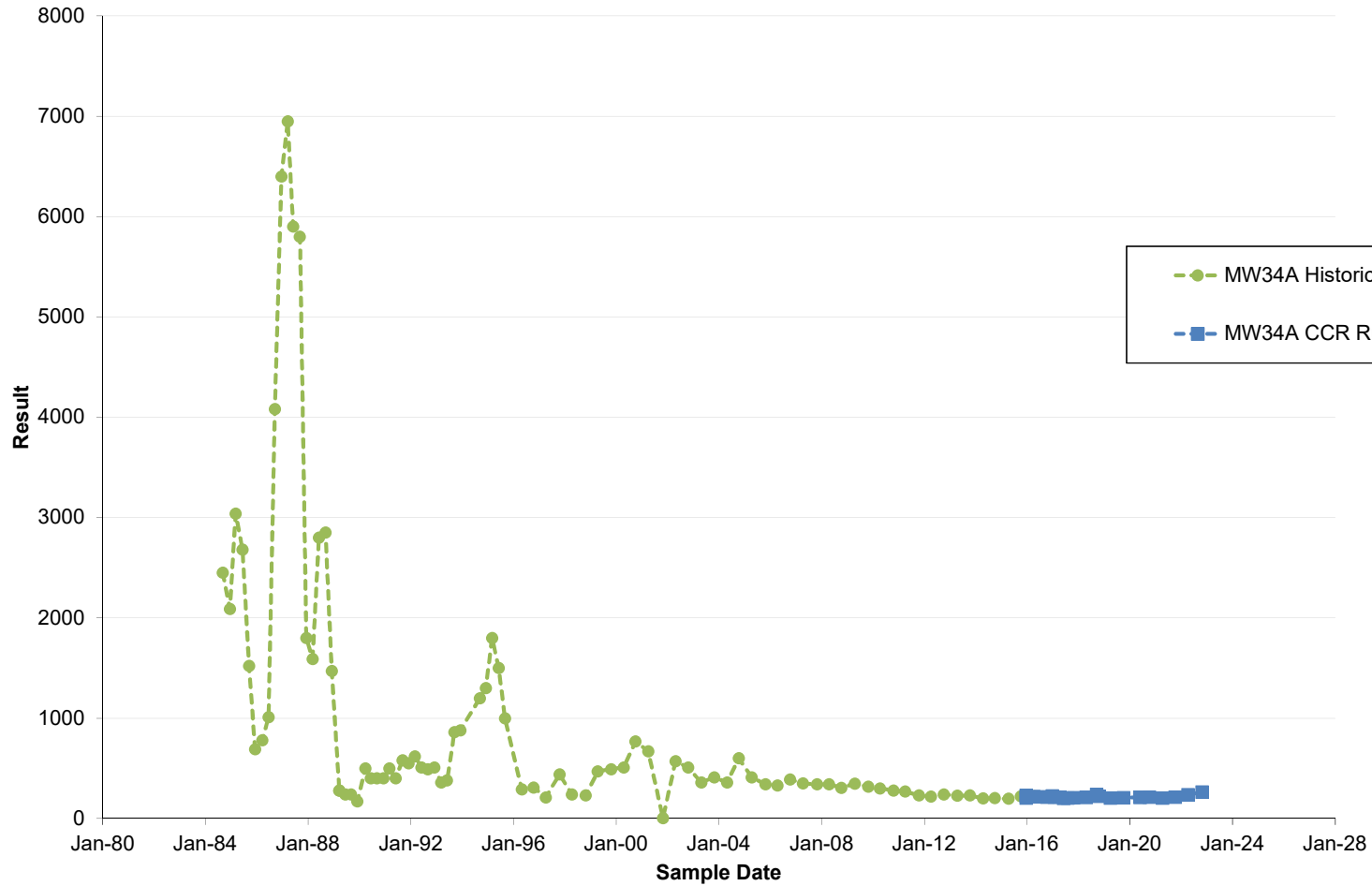
Appendix C
Long-Term Concentration Trend Plots

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33A and MW-33AR - Boron ($\mu\text{g/l as B}$)



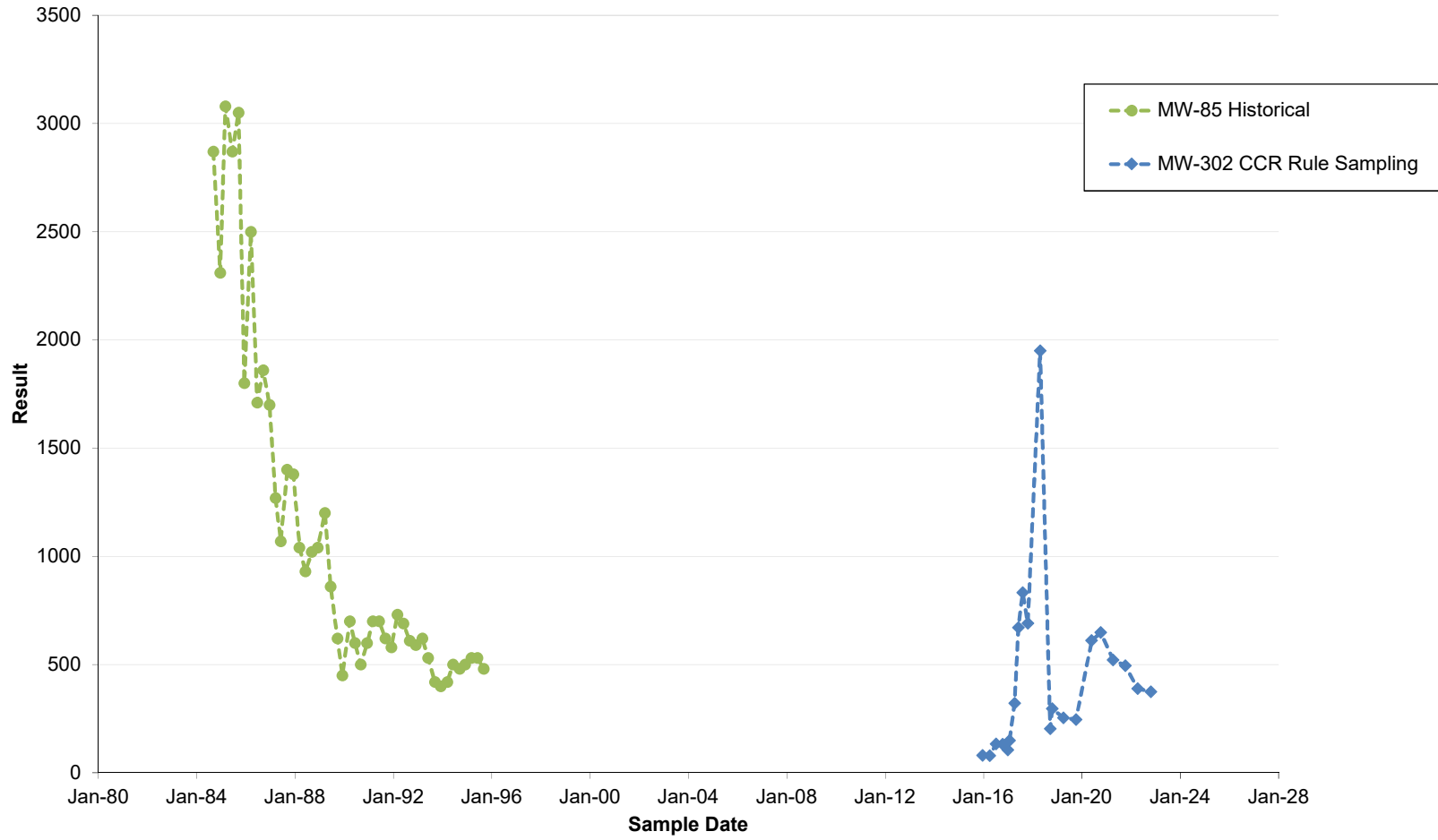
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[Bo_COL Dry.xlsx]MW-33AR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW34A - Boron ($\mu\text{g/l}$ as B)



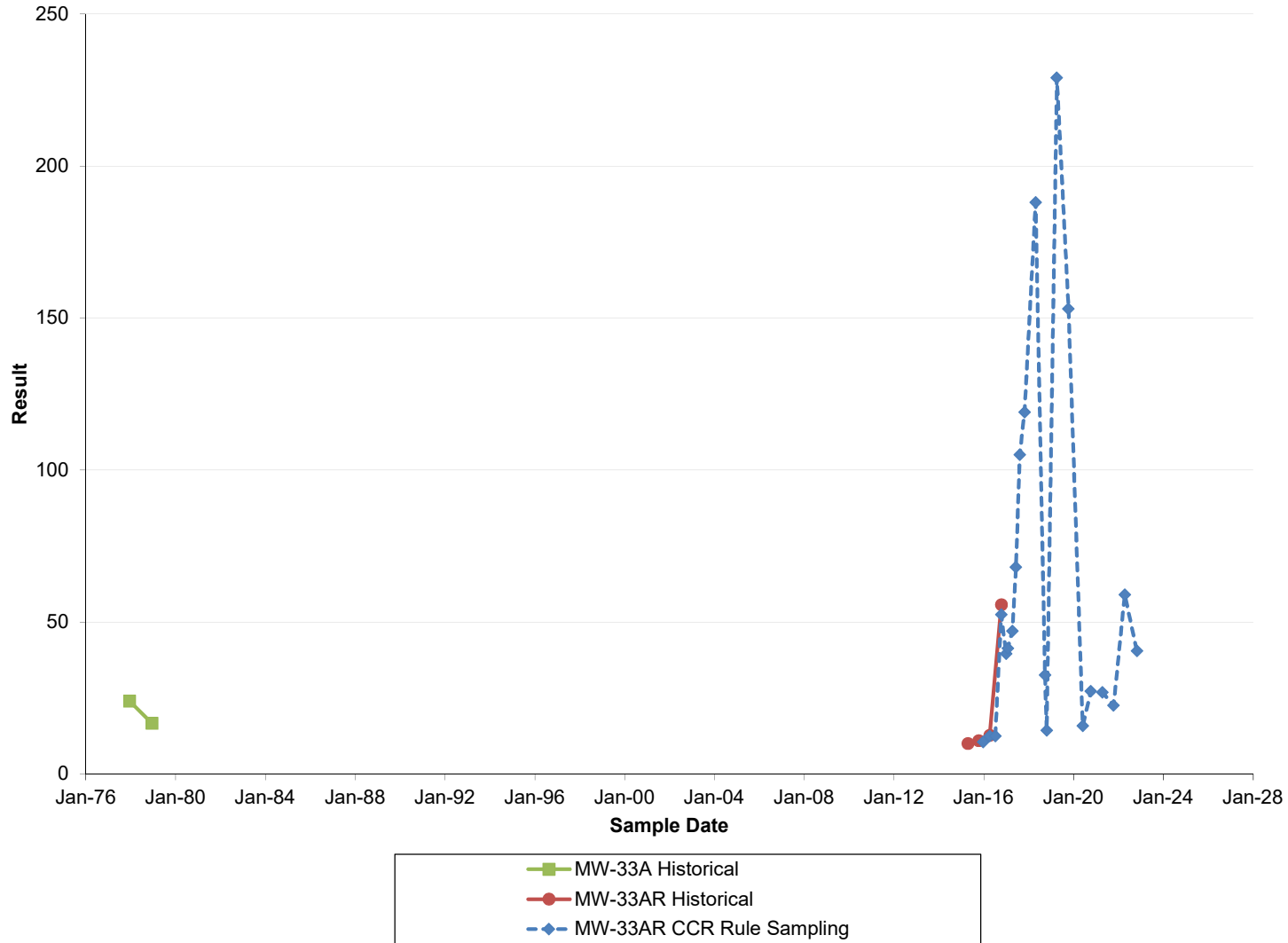
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[Bo_COL Dry.xlsx]MW-34A

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-302 and MW-85 - Boron ($\mu\text{g/l}$ as B)



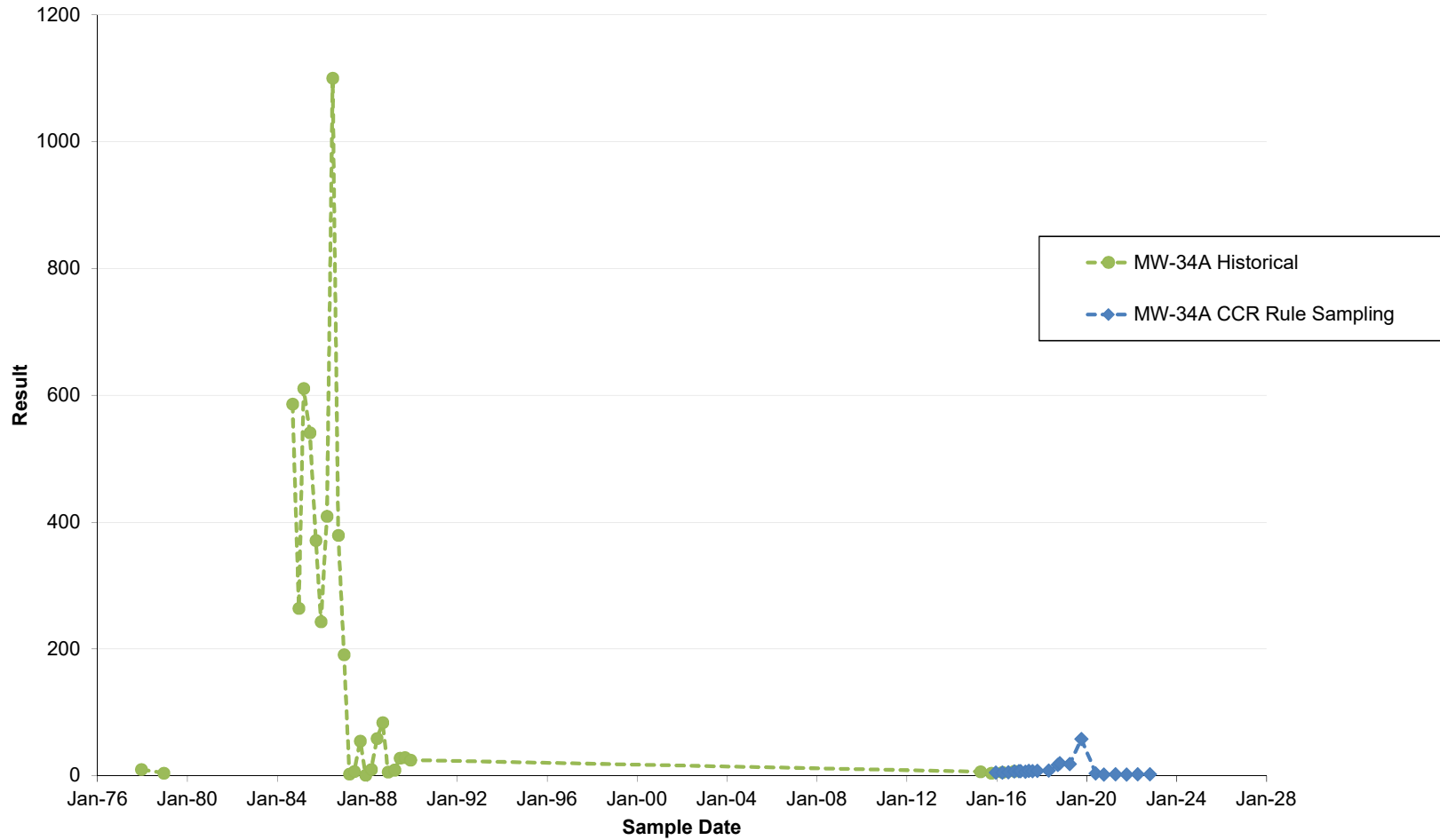
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[Bo_COL Dry.xlsx]MW-85

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33 and MW-33AR - Chloride (mg/l as Cl)



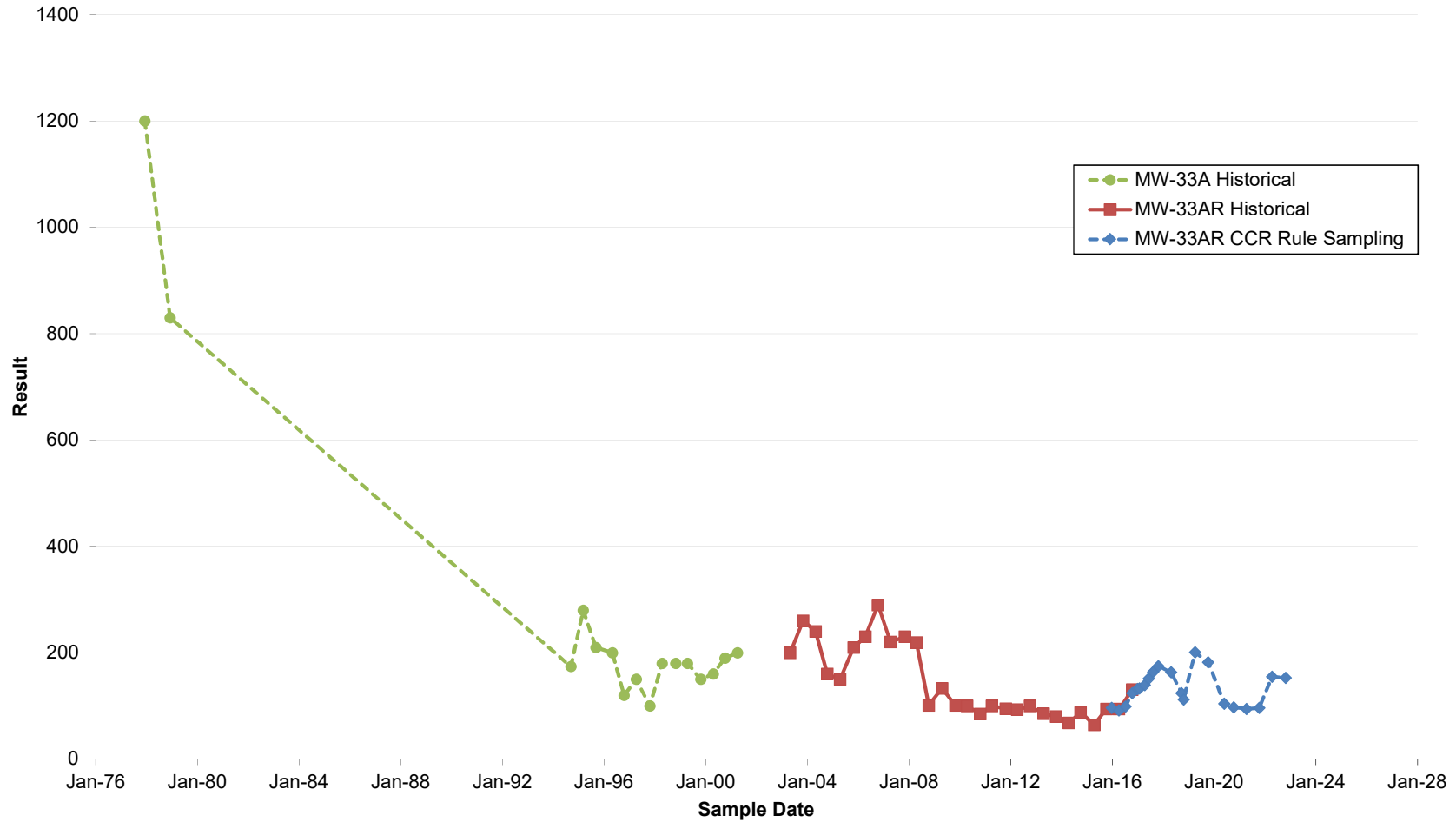
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[Cl_COL Dry.xlsx]MW-33AR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW34A - Chloride (mg/l as Cl)



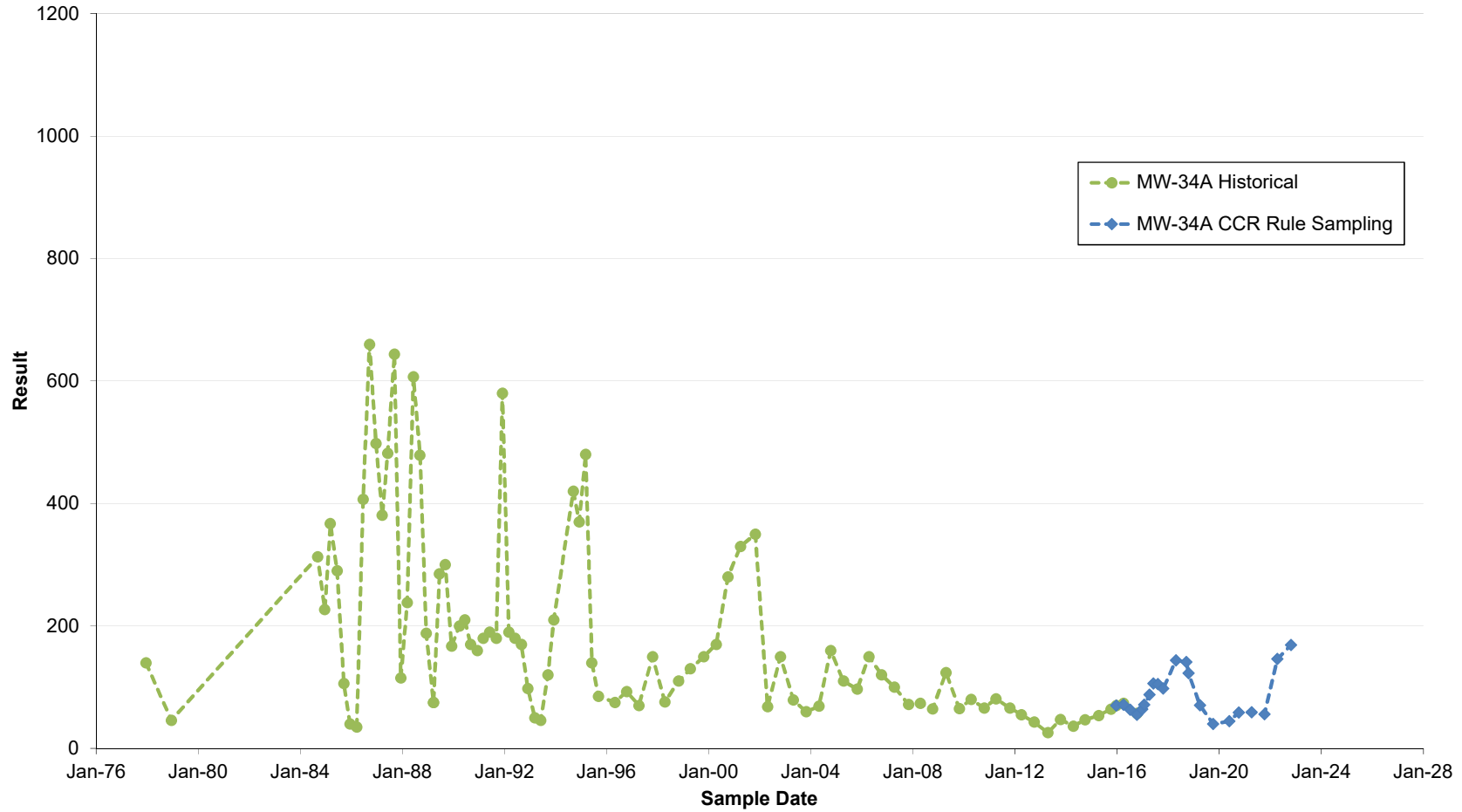
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[Cl_COL Dry.xlsx]MW-34A

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33 and MW-33AR - Sulfate (mg/l as SO₄)



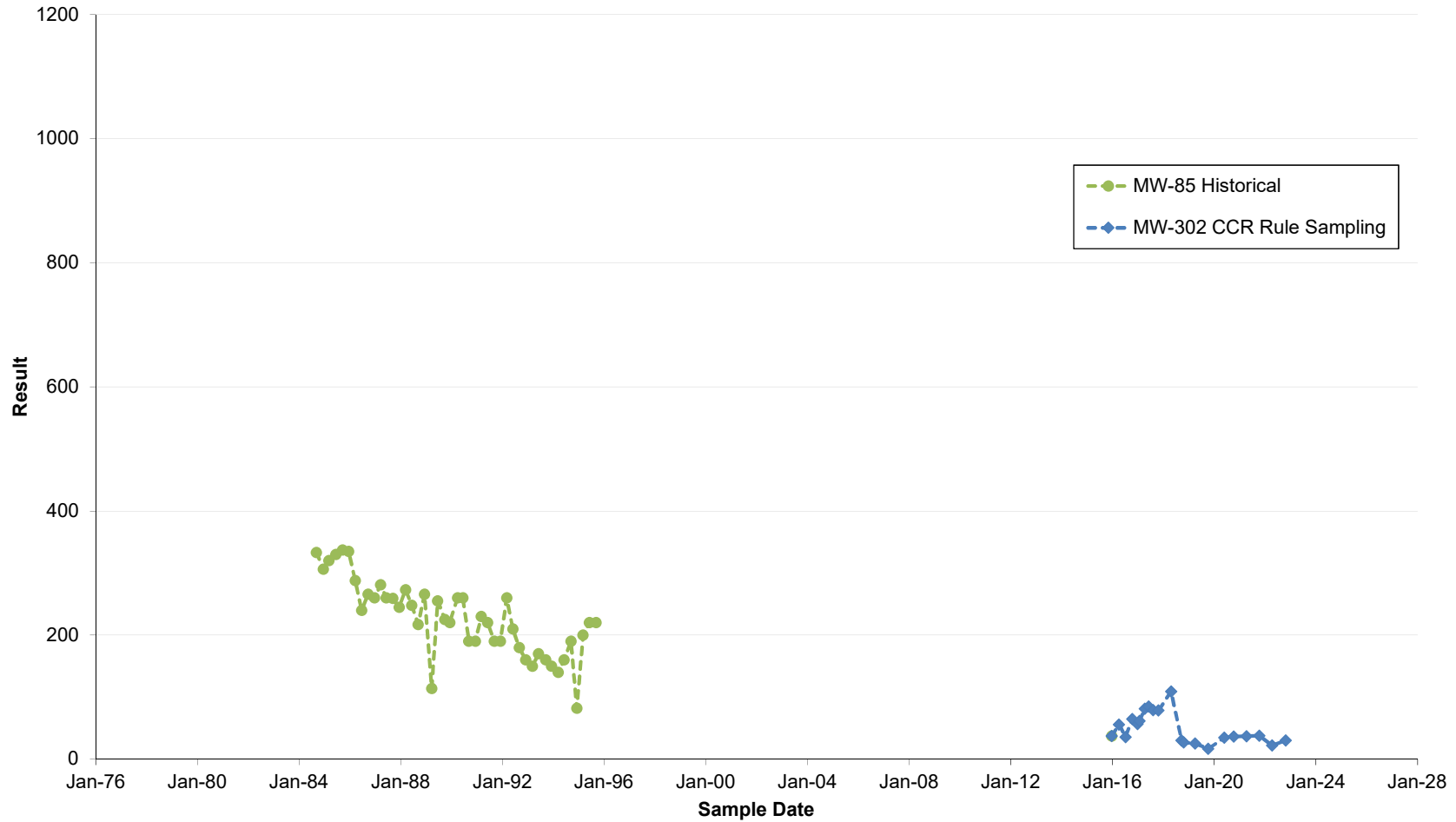
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[SO4_COL Dry.xlsx]MW-33AR CCR


Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-34A - Sulfate (mg/l as SO4)



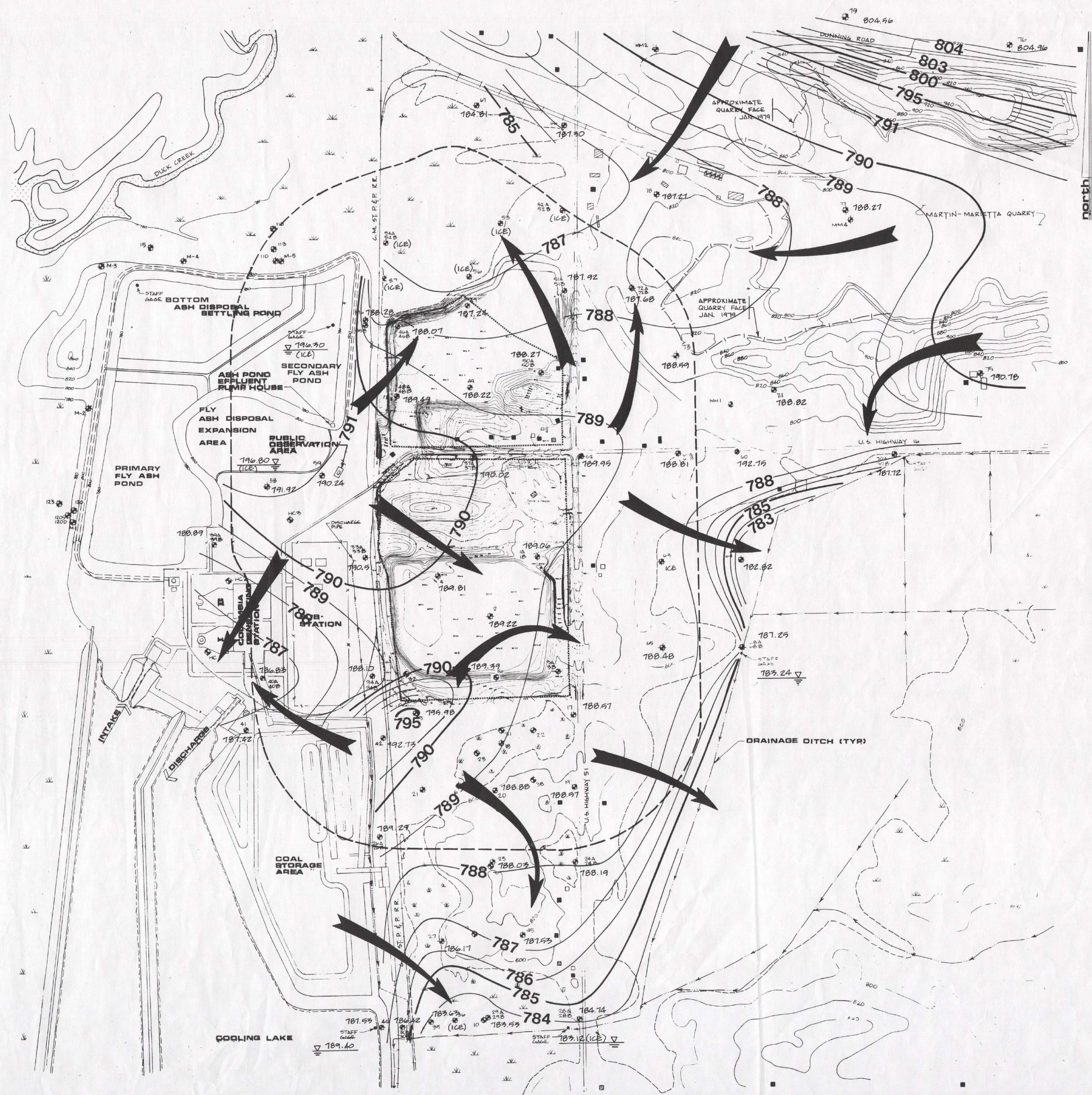
I:\25223067.00\Deliverables\COL MOD 1 - 3 ASD October 2022\Graphs\[SO4_COL Dry.xlsx]MW-34A CCR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-85 and MW-302 - Sulfate (mg/l as SO4)



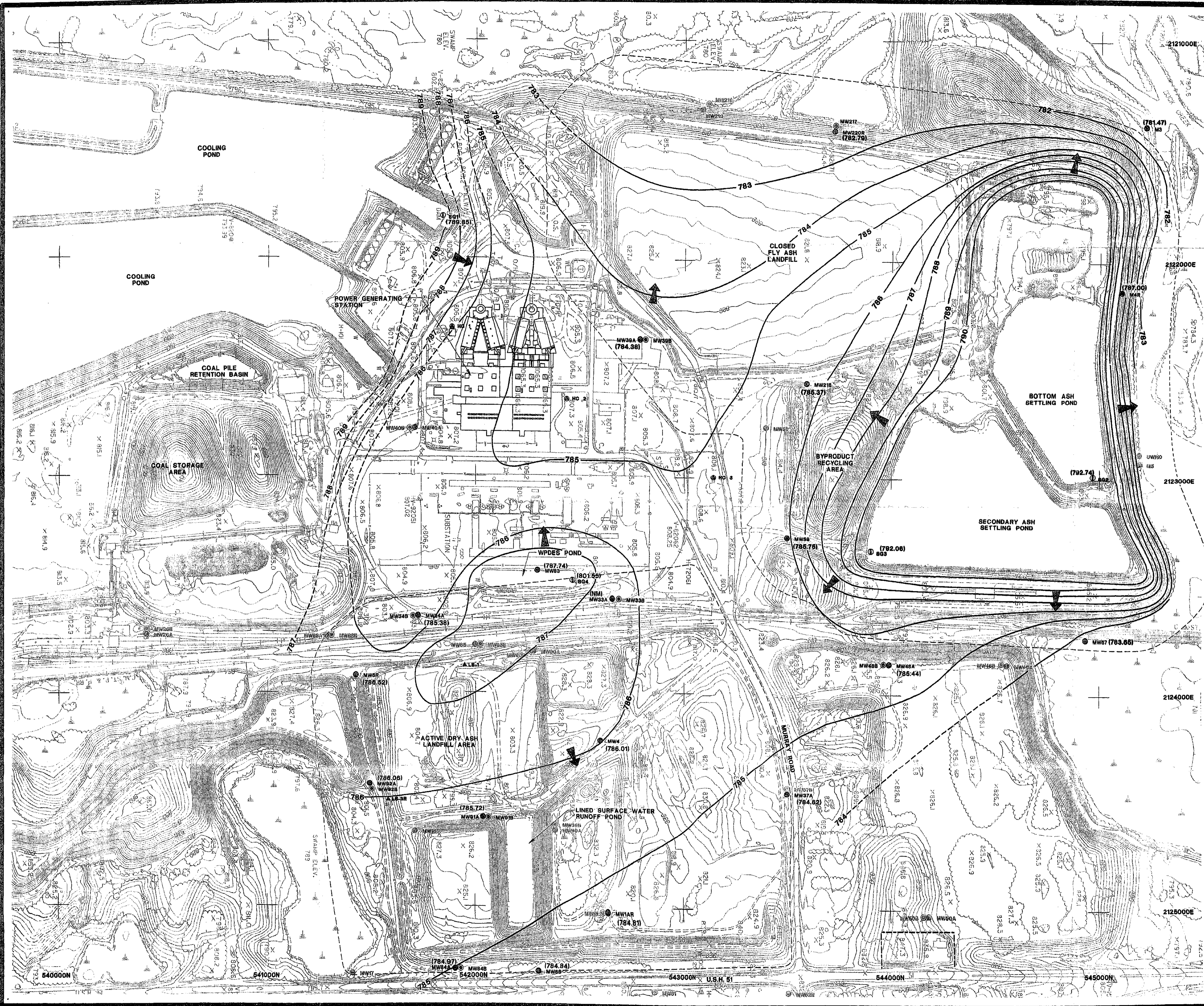


Appendix D
Historical Groundwater Flow Maps



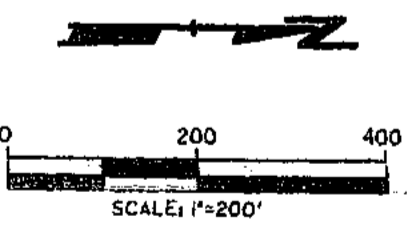
- LEGEND**
- PROPOSED PROJECT AREA
 - ⊕ 720.29 OBSERVATION WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
 - ⊕ BORING LOCATION AND NUMBER
 - WETLANDS
 - TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL: 20FT.)
 - PRIVATE RESIDENCES (ASSUMED LOCATIONS OF PRIVATE WATER SUPPLY WELLS)
 - ▣ COMMERCIAL BUILDINGS (ASSUMED LOCATIONS OF POSSIBLE PUBLIC WATER SUPPLY WELLS)
 - SURFACE WATERS (STREAMS OR DRAINAGE DITCHES); ARROWS INDICATE DIRECTION OF FLOW
 - OTHER BUILDINGS (GARAGES, BARN, ETC.)
 - ⊕ HIGH CAPACITY WELLS
 - 790— WATER TABLE CONTOURS (CONTOUR INTERVAL: 1 FT.)
 - ➔ DIRECTION OF GROUNDWATER FLOW

NO	BY	DATE	REVISION	APPD
WATER TABLE CONTOUR MAP 2/4/81				
PLAN OF OPERATION - ASH DISPOSAL FACILITY COLUMBIA SITE WISCONSIN POWER & LIGHT COMPANY PART OF SECTIONS 27 & 34, T12N, R9E TOWN OF PACIFIC COLUMBIA CO. WISCONSIN				
DRAWN TDH		SCALE 1"=300'	SHEET 39 OF 39	
CHECKED RJK		DATE 2/10/81	DRAWING NO.	
APPROVED			C7134-94	
REFERENCE			PRINTED 8/3/88	



- LEGEND**
- PROPERTY LINE
 - EXISTING RAILROAD TRACKS
 - EXISTING GROUND CONTOUR
 - CONTOUR DEPRESSION
 - EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EXISTING FENCE
 - EXISTING BUILDING
 - EXISTING SPOT ELEVATION
 - TRES AND/OR BRUSH
 - WETLAND AREA
 - EDGE OF WATER
 - HC 1 WATER SUPPLY WELL
 - MW61A WATER TABLE WELL
 - MW61B PIEZOMETER
 - ABANDONED WATER TABLE WELL
 - ABANDONED PIEZOMETER
 - 801 STAFF GAUGE
 - ▲ L&S-1 LYSEMETER
 - DESIGN MANAGEMENT ZONE
 - PROPERTY LINE
 - O.S. OPEN STORAGE
 - O.H. OVERHEAD STRUCTURE
 - E.P.S. ELECTRICAL POWER STATION
 - T TANK
 - W WALL
 - (785.31) WATER TABLE ELEVATION (FT.-MSL)
(N.M. = NOT MEASURED)
 - 786 GROUNDWATER CONTOUR LINE
(FT. INTERVAL - FT. M.S.L.)
(DASHED WHERE INFERRED)
 - ➔ GROUNDWATER FLOW DIRECTION

- NOTES**
1. BASE MAP IS PROVIDED BY WISCONSIN POWER & LIGHT CO. AND IS BASED ON PHOTOS TAKEN ON APRIL 6, 1995 BY AERO-METRIC ENGINEERING, SHEBOYGAN, WI.
 2. HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE. DATUM HAD 6560.
 3. VERTICAL DATUM IS REFERENCED TO U.S.G.S. MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
 4. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER & LIGHT CO. IN DECEMBER 1994 & NOVEMBER 1996.
 5. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE.
 6. WATER ELEVATION USED TO PREPARE THIS MAP WERE MEASURED ON OCTOBER 24, 2002.
 7. THE WATER LEVEL AT MW 33A AND MW 33B COULD NOT BE MEASURED DURING OCTOBER 2002 DUE TO AN OBSTRUCTION IN THE WELL CASING.



3.			
2.			
1.			
NO. BY DATE	REVISION		APP'D.
PROJECT: ALLIANT ENERGY - WP&L COLUMBIA ASH PONDS & DRY ASH DISPOSAL FACILITY			
SHEET TITLE: WATER TABLE MAP (OCTOBER 2002)			
DRAWN BY: defoeJ	SCALE: 1"=200'	PROJ. NO. 3024.28	FILE NO. WATERTBL.PLT
CHECKED BY: JCR	DATE PRINTED:	FIGURE 3	
APPROVED BY: JCO	DATE: JANUARY 2003		
144 Highland Trail Madison, WI 53717-1934 P.O. Box 9923 Madison, WI 53708-6923 Phone: 608-831-4444		RMT	

PROJ. DATE: 10/24/02
 DRAWN BY: defoeJ
 CHECKED BY: JCR
 APPROVED BY: JCO
 DATE: JANUARY 2003
 SCALE: 1"=200'
 FIGURE 3

E2 April 2023 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration April 2023 Detection Monitoring

Dry Ash Disposal Facility, Modules 1-3
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:



SCS ENGINEERS

25223067.00 | November 21, 2023

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

Table of Contents

Section	Page
PE Certification	iii
1.0 Introduction	1
1.1 §257.94(e)(2) Alternative Source Demonstration Requirements	1
1.2 Site Information and Map	1
1.3 Statistically Significant Increases Identified	2
1.4 Overview of Alternative Source Demonstration.....	2
2.0 Background	3
2.1 Regional Geology and Hydrogeology	3
2.1.1 Regional Information.....	3
2.1.2 Site Information	3
2.2 CCR Rule Monitoring System	4
2.3 Other Monitoring Wells.....	4
3.0 Methodology and Analysis Review	4
3.1 Sampling and Field Analysis	4
3.2 Laboratory Analysis Review	5
3.3 Statistical Evaluation Review.....	5
3.4 Summary of Methodology and Analysis Review Findings	5
4.0 Alternative Sources	5
4.1 Potential Causes of SSI.....	5
4.1.1 Natural Variation	5
4.1.2 Man-Made Alternative Sources	6
4.2 Lines of Evidence	6
4.2.1 Pre-Landfill Water Quality	6
4.2.2 Long-Term Concentration Trends	7
4.2.3 Groundwater Flow Direction Changes.....	7
4.2.4 Chloride and Boron Concentrations	8
5.0 Alternative Source Demonstration Conclusions	8
6.0 Site Groundwater Monitoring Recommendations	9
7.0 References	10

Tables

Table 1.	Groundwater Analytical Results Summary – April 2023 Event
Table 2.	Historical Analytical Results for Parameters with SSIs
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network
Table 4.	Analytical Results – Lysimeters and Leachate Pond

Figures



- Figure 1. Site Location Map
- Figure 2. Site Plan and Monitoring Well Locations
- Figure 3. Water Table Map – April 2023

Appendices

- Appendix A Trend Plots for CCR Wells
- Appendix B Feasibility Study Water Quality Information
- Appendix C Long-Term Concentration Trend Plots
- Appendix D Historical Groundwater Flow Maps

I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\231121_COL_1-3 LF_Apr 2023 ASD_Final.docx

PE CERTIFICATION

 <p>11/20/2023</p>	<p>I, Sherren Clark, hereby certify that the information in this alternative 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.</p>
	
	<p>11/20/2023</p>
	<p>(signature) (date)</p>
	<p>Sherren Clark, PE (printed or typed name)</p> <p>License number E-29863</p> <p>My license renewal date is July 31, 2024.</p> <p>Pages or sheets covered by this seal: Alternative Source Demonstration, April 2023 Detection Monitoring, Dry Ash Disposal Facility, Modules 1-3, Columbia Energy Center, Pardeeville, Wisconsin</p>

[This page left blank intentionally]

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*.

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 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 evaluates the SSIs observed in the statistical evaluation of the October 2022 detection monitoring event at the Columbia Energy Center (COL) Dry Ash Disposal Facility (ADF), Modules 1-3 CCR Unit. The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018). The October 2017 ASD and subsequent semiannual updates have provided several lines of evidence demonstrating that SSIs reported for boron, chloride, field pH, and sulfate concentrations in the downgradient monitoring wells were likely due to man-made sources other than the CCR Units and/or naturally occurring constituents in the alluvial aquifer.

As discussed in more detail in **Section 4.2** of this ASD, the findings for the April 2023 monitoring event were consistent with those for the previous events.

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 ADF and the Ash Ponds Facility. This ASD will evaluate the conditions at the site for Modules 1-3 of the ADF only. The ADF is operated under the Wisconsin Department of Natural Resources (WDNR) License No. 3025.

The groundwater monitoring system monitors the following CCR Unit:

- COL Dry ADF – Modules 1-3 (existing CCR Landfill)

Modules 1-3 were originally described as separate existing CCR landfills, although they are contiguous and are managed as a single landfill by the facility and by the WDNR. Wisconsin Power and Light Company (WPL) subsequently clarified that Modules 1-3 are one existing CCR landfill under the federal CCR Rule, and this report reflects WPL's clarification.

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 as **Figure 2**. Separate monitoring systems have been established for the other CCR Units at COL, which include Modules 4-6 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

SSIs were identified by comparing the monitoring results to Upper Prediction Limits (UPLs) established in accordance with 40 CFR 257.93(f)(3) and the statistical method previously selected for the CCR Unit. The UPLs are based on an interwell approach using two background monitoring wells: MW-84A and MW-301. The interwell UPLs were calculated based on a 1-of-2 resampling approach. The UPLs and results for the April 2023 monitoring event are summarized in **Table 1**.

The April 2023 SSIs include the following parameters and wells:

- Boron: MW-33AR, MW-34A, MW-302
- Chloride: MW-33AR
- Sulfate: MW-33AR, MW-34A, MW-302

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**).

The CCR Rule constituent results from background and compliance sampling for parameters with SSIs are provided in **Table 2**. The laboratory reports for the April 2023 detection monitoring event will be included in the 2023 Annual Groundwater Monitoring and Corrective Action Report to be completed in January 2024. 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

A more detailed discussion of the background information for the site is provided in the ASD for the October 2017 event (SCS, 2018).

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 the uppermost aquifer, as defined under 40 CFR 257.53. 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 October 2017 ASD (SCS, 2018).

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 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 wells MW-301 and MW-302, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously installed monitoring wells MW-33AR, MW-34A, MW-84A, and MW-1AR (abandoned) show silty sand and sand as the primary unconsolidated materials at these locations. All CCR monitoring wells are screened within the unconsolidated sand unit.

Shallow groundwater at the site generally flows to the north and west across the existing landfill Modules 1-3 area, then generally flows west toward the Wisconsin River. The groundwater flow map for April 2023 is shown on **Figure 3**. Historically, localized groundwater mounding was associated with the ash ponds; however, flow in the ash pond area changed in 2022 and 2023 as the ponds were closed and CCR was removed. In 2022, dewatering wells located around the Secondary 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 April 2023 groundwater flow map shows temporary inward gradients in the vicinity of the Primary Ash Pond due to dewatering activities. These temporary changes may have had some impact on flow directions in the MOD 1-3 area, but the general flow directions to the north and/or west did not change. The groundwater elevation data for the CCR monitoring wells and state monitoring program wells are provided in **Table 3**.

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-302, MW-33AR, and MW-34A. MW-1AR was added to the monitoring program in 2021 as a supplemental well because monitoring data have indicated that the groundwater flow direction in this part of the site is sometimes to the northeast. MW-1AR was abandoned in 2022 because it was within the footprint of the Modules 10-11 expansion area. The monitoring network certification was updated with the abandonment of MW-1AR in October 2022. Flow direction in this area of the site will continue to be monitored by additional wells in the State monitoring program, including water level-only monitoring wells MW-312 and MW-93A, and CCR rule monitoring wells for Modules 10-11, including MW-313, MW-314, and MW-315. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 29 to 51 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 did not identify any sampling errors for field data that may have caused or contributed to observed SSIs.

The April 2023 monitoring event was completed in accordance with the Sampling and Analysis Plan for the monitoring system.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2023 detection monitoring event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for boron, chloride, or 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 analysis issues that could have caused or contributed to the observed SSIs for boron, chloride, and sulfate.

Time series plots of the SSI constituent analytical data were 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 plots are provided in **Appendix A**. The concentrations observed are similar to historical concentrations for sulfate, boron, and chloride.

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 review of the statistical evaluation, SCS did not identify any errors or issues in the statistical evaluation that caused or contributed to the determination of interwell SSIs for the April 2023 detection monitoring event.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the April 2023 monitoring event based on the methodology and analysis review. No other errors or issues causing or contributing to the reported SSIs were identified.

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, chloride, and sulfate SSIs at the downgradient monitoring wells; 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 interwell approach, comparing the April 2023 detection monitoring results to the UPLs calculated based on the sampling of the background wells (MW-84A and MW-301). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation. Previous monitoring results for boron, chloride, and sulfate at COL Modules 1-3 landfill are shown in **Table 2**.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron, chloride, and sulfate SSIs.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, chloride, and sulfate SSIs could include the closed ash pond landfill, the active and inactive ash ponds, the former ash pond effluent ditch, the coal storage area, road salt use, railroad operations, or other plant operations.

Based on the groundwater flow directions and on previous investigations at the site, the former ash pond effluent ditch, a non CCR alternative source, appears to be the most likely cause of the boron and/or sulfate SSIs for wells MW-33AR, MW-34A, and MW-302. The ash pond effluent ditch may also have contributed to the chloride SSI at MW-33AR.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, chloride, and sulfate in compliance wells MW-33AR, MW-34A, and MW-302, relative to the background wells, are due to an alternative source include:

1. Elevated levels of boron, chloride, and sulfate were present in the area west of the landfill, where the three compliance wells are located before the landfill was constructed.
2. Monitoring performed under the state program documents that the concentrations of boron, chloride, and sulfate were elevated before CCR disposal in the landfill began, and have decreased since the landfill has been in operation.
3. Groundwater flow directions have changed through time due to changes in water management at the plant, so that groundwater impacted by the effluent ditch formerly flowed to the east, under the landfill, and is now flowing west and/or north.
4. The variations in chloride results for well MW-33AR since detection monitoring was initiated have not correlated with boron concentrations, as would be expected for a CCR leachate source; therefore, an alternative source is more likely.

4.2.1 Pre-Landfill Water Quality

Elevated levels of boron, chloride, and sulfate were present in the area west of the landfill, where the three compliance wells are located, before the landfill was constructed. Groundwater monitoring performed in 1977 and 1978 as part of the Feasibility Study for the landfill permitting showed that wells located along the west side of the future landfill footprint, where the current compliance wells are located, had elevated results for sulfate, chloride, and specific conductance. The 1978 Feasibility Study (Warzyn, 1978) for the Dry ADF discusses the influence of the ash pond effluent ditch on groundwater west of the proposed site. The former ash pond effluent ditch carried effluent from the ash ponds located north of the plant, and flowed south between the west side of the current landfill and the substation. Groundwater monitoring in December 1977 indicated that sulfate was present at 1,200 milligrams per liter (mg/L) in MW-33A, which was located near the point where the ash pond effluent discharged from a culvert into the effluent ditch. The sulfate concentration at this well decreased to 830 mg/L in the December 1978 sampling (Warzyn, 1979). Current concentrations of sulfate in this area, while above background, are much lower. The April

2023 sulfate result for MW-33AR (installed to replace MW-33A) was 104 mg/L, for MW-34A was 48.4 mg/L, and for MW-302 was 36.6 mg/L (**Table 1**).

Selected text and tables from the 1978 Feasibility Study and the 1979 Supplementary Feasibility Study Report are included in **Appendix B**.

4.2.2 Long-Term Concentration Trends

Monitoring performed under the state program documents that the concentrations of boron and sulfate were elevated before CCR disposal in the landfill began, and have decreased since the landfill has been in operation. Routine groundwater monitoring for the COL ADF began after the Plan of Operation was approved and prior to initial CCR disposal. The earliest data available from the WDNR Groundwater Environmental Monitoring System (GEMS) database is from September 1984. Initial placement of CCR in test plots in Module 1 of the ADF was approved in October 1984, and CCR disposal began sometime after that. Therefore, the initial groundwater monitoring results in the GEMS database represent pre-disposal conditions for the landfill.

The earliest historic monitoring data show that before CCR disposal in the landfill began, concentrations of boron and sulfate were significantly higher than current concentrations in the area west of the landfill where the compliance wells are located. Graphs of historical concentrations are provided in **Appendix C**. Results for compliance well MW-33AR are plotted with results from well MW-33A. MW-33AR was a replacement well for MW-33A at a slightly different location and depth. The well screen was installed approximately 10 feet higher in MW-33AR than in MW-33A, intersecting the water table, which may explain the increase in concentration that occurred with the well replacement. Results for compliance well MW-302 are plotted with results from monitoring well MW-85, which was located near the current MW-302 location (see **Figure 2**) and was monitored from September 1984 through September 1995.

The recent boron concentrations are consistent with generally decreasing or stable historical concentrations at MW-33AR and MW-34A (**Appendix A** and **Appendix C**). Recent boron concentrations at MW-302 have been variable, but remain well below the concentrations observed in samples from MW-85 prior to CCR disposal in the landfill.

4.2.3 Groundwater Flow Direction Changes

Groundwater flow directions have changed through time due to changes in water management at the plant, so that groundwater impacted by the effluent ditch formerly flowed to the east, under the landfill, and is now flowing north and/or west. The 1978 Feasibility Study report states that the southern 2/3 of the proposed fill area (including the area of the active CCR landfill phases) exhibits a southeast and southerly groundwater flow direction, toward an agricultural drainage ditch southeast and south of the landfill area. The 1981 Plan of Operation indicates that flow in the landfill area is to the east-southeast. A water table map prepared by RMT, based on October 2002 water level measurements, shows flow under the landfill generally to the east and northeast from a groundwater high near the effluent ditch and Wisconsin Pollutant Discharge Elimination System (WPDES) pond between the landfill and the substation. The 1981 and 2002 water table maps are provided in **Appendix D**.

Under current conditions, groundwater flow below the active landfill area is generally to the north and northwest. The flow changes with time reflect the termination of discharge to the ash pond effluent ditch in the mid-2000s. When discharge via this ditch was active, the ditch was a source of recharge to the groundwater and created a high groundwater area with flow moving away from the

ditch to the east. After discharge to the ditch was terminated, water levels in this area decreased significantly and the groundwater flow direction changed.

With the changes in groundwater flow, historically impacted groundwater moved in alternating directions. While the effluent ditch was active, impacted groundwater likely moved eastward past the current compliance wells, as indicated by the long-term concentration data. Although the compliance wells on the west side of Modules 1-3 are downgradient from the landfill under current flow conditions, the observed groundwater impacts may be residual from the past when the wells were downgradient from the effluent ditch.

4.2.4 Chloride and Boron Concentrations

The variations in chloride results for well MW-33AR since detection monitoring was initiated have not correlated with boron concentrations, as would be expected for a CCR leachate source; therefore, an alternative source is more likely. The chloride results for well MW-33AR increased beginning in 2016, peaked in April 2018 and April 2019, decreased significantly in May 2020, and have remained relatively low since then. The 2022 and April 2023 concentrations exceeded the interwell UPL but were significantly lower than the values observed in 2019 (**Table 2** and **Appendix A**). Current chloride concentrations at MW-33AR are similar to those reported for samples from MW-33A prior to CCR disposal in the landfill (**Appendix B**).

Over the time period since 2016, when chloride concentrations at MW-33AR were highly variable, boron concentrations at MW-33AR have been generally following a long, steady decreasing trend. The lack of correlation with boron indicates the source of the increase and subsequent decrease in chloride is not likely the CCR landfill.

Sampling of the landfill leachate pond and lysimeters LS-1 and LS-3R, located on the western and southern edges of Modules 1-3, indicates that boron and chloride concentrations are generally both higher than background (**Table 4**); therefore, a leachate source would tend to influence concentrations of both parameters. Furthermore, the peak chloride concentrations in the groundwater samples from MW-33AR in 2018 and 2019 exceeded the chloride concentrations measured in the leachate at that time, indicating the leachate was not the source of chloride at this location (**Table 2**, **Table 4**, and **Appendix A**). Recent samples from the leachate pond have shown increased concentrations of chloride, but this increase does not correlate with results at MW-33AR, which have decreased, or with chloride results from the lysimeters, which remain low. Based on the comparison of groundwater and leachate chloride results, an alternative man-made source, such as road salt, is a more likely source of chloride than the CCR Unit.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, chloride, and sulfate concentrations in downgradient monitoring wells MW-33AR, MW-34A, and/or MW-302 demonstrate that the SSIs are likely primarily due to sources other than the CCR Unit. Boron and sulfate concentrations were elevated prior to disposal of CCR in the landfill and are associated with historical discharges from the ash ponds via the effluent ditch located west of the landfill. Pre-landfill chloride concentrations at MW-33A were also similar to current concentrations at MW-33AR and historic impacts may have contributed to the SSI for chloride. However, based on more recent higher concentrations of chloride, elevated chloride concentrations detected at well MW-33AR appear more likely to be related to an alternative non-CCR source, such as salt.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the COL Modules 1-3 CCR Units may continue with detection monitoring based on this ASD. The ASD report will be included in the 2023 Annual Report due January 31, 2024.

7.0 REFERENCES

SCS Engineers, 2018, Alternative Source Demonstration, October 2017 Detection Monitoring, Columbia Energy Center Dry Ash Disposal Facility, April 2018.

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., 1979, and Preliminary Engineering Concepts, Columbia Site, Wisconsin Power and Light Company, Town of Pacific, Columbia County, WI, January 1978.

Tables

- 1 Groundwater Analytical Results Summary – April 2023 Event
- 2 Historical Analytical Results for Parameters with SSIs
- 3 Groundwater Elevation – State Monitoring Program and CCR Well Network
- 4 Analytical Results – Lysimeters and Leachate Pond

**Table 1. Groundwater Analytical Results Summary -
Columbia Landfill MOD 1-3 / SCS Engineers Project #25223067.00**

Parameter Name	UPL Method	UPL	Background Wells		Compliance Wells		
			MW-84A	MW-301	MW-33AR	MW-34A	MW-302
			4/27/2023	4/27/2023	4/24/2023	4/26/2023	4/27/2023
Appendix III							
Boron, ug/L	P	35.6	10.3	20.1	532	220	541
Calcium, ug/L	NP	129,000	68600	120000	55300	49600	66500
Chloride, mg/L	P	6.2	3.0	1.5 J	19.0	2.0	1.3 J
Fluoride, mg/L	DQ	DQ	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH, Std. Units	P	7.78	7.01	6.65	7.61	7.53	7.36
Sulfate, mg/L	P	30.3	1.3 J	12.3	104	48.4	36.6
Total Dissolved Solids, mg/L	NP	514	326	526	394	302	352

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	NP = Nonparametric UPL with 1-of-2 retesting
DQ = Double Qualification	P = Parametric UPL with 1-of-2 retesting
SSI = Statistically Significant Increase	LOQ = Limit of Quantitation
-- = Not Measured	LOD = Limit of Detection
µg/L = micrograms per liter	mg/L = milligrams per liter

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. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background wells MW-84A and MW-301. Interwell UPLs based on 1-of-2 retesting approach. UPLs updated in January 2020 based on background well results through October 2019.
3. Interwell UPLs calculated based on results from background wells MW-84 and MW-301.

Created by: <u>NDK</u>	Date: <u>5/17/2022</u>
Last revision by: <u>NLB</u>	Date: <u>9/20/2023</u>
Checked by: <u>RM</u>	Date: <u>10/3/2023</u>
Scientist/Proj Mgr QA/QC: <u>TK</u>	Date: <u>11/11/2023</u>

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Background	MW-301	12/22/2015	26.5	3.70 J	9.30
		4/5/2016	25.2	4.00	15.3
		7/8/2016	23.6	3.50 J	15.0
		10/13/2016	30.6	2.20	13.9
		12/29/2016	32.8	2.00 J	12.3 J
		1/25/2017	32.6	1.50 J	6.50
		4/11/2017	28.8	2.00	10.3
		6/6/2017	21.3	3.50	17.1
		8/8/2017	30.6	5.50	31.6
		10/23/2017	34.3	4.00	27.5
		4/25/2018	24.3	2.30	8.60
		8/8/2018	22.8	--	--
		10/22/2018	27.8	3.20	19.2
		4/3/2019	26.9	2.90 J, B	5.30 J
		10/9/2019	35.9	1.70	8.40
		5/29/2020	21.3	2.00 J	11.5 J
		10/8/2020	28.8	3.40	25.1
		4/13/2021	22.2	1.50 J	8.5
		10/14/2021	31.4	2.70	17.4
		4/13/2022	28.7	1.90 J	12.7
	10/27/2022	37.5	2.3	11.6	
	4/27/2023	20.1	1.5 J	12.3	
	MW-84A	12/22/2015	11.9	4.90	4.90
		4/5/2016	14.0	4.70	4.30
		7/8/2016	14.7	5.10	3.70 J
		7/28/2016	--	--	--
		10/13/2016	11.1	4.30	2.60 J
		12/29/2016	14.7	4.70	2.70 J
		1/25/2017	16.1	4.60	3.00
		4/11/2017	12.9	4.90	2.80 J
		6/6/2017	14.8	5.50	2.70 J
		8/8/2017	22.9	5.50	2.00 J
		10/24/2017	13.8	5.10	2.20 J
		4/25/2018	25.0	4.80	2.80 J
8/8/2018		12.8	--	--	
10/22/2018		10.1 J	4.20	1.60 J	
4/3/2019	13.6	3.60 B	1.40 J		
10/9/2019	12.0	3.90	1.30 J		
5/29/2020	10.0	3.70	1.50 J		
10/8/2020	9.7 J	4.30	1.30 J		
4/13/2021	14.3	4.40	1.40 J		
10/14/2021	11.1	3.50	17.4		
4/13/2022	10.5	5.20	1.40 J, M0		
10/27/2022	12.2	3.4	1.1 J		
4/27/2023	10.3	3.0	1.3 J		

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Compliance	MW-302	12/22/2015	80.0	4.20	37.4
		4/5/2016	78.8	4.10	55.6
		7/7/2016	134	3.10 J	35.4
		10/13/2016	132	1.10 J	64.7
		12/29/2016	106	1.20 J	56.4
		1/25/2017	149	1.60 J	61.6
		4/11/2017	322	1.60 J	81.3
		6/6/2017	671	3.50	84.6
		8/8/2017	833	4.50	79.0
		10/24/2017	691	6.90	78.4
		4/24/2018	1,950	15.0	109
		9/21/2018	203	1.70 J	30.0
		10/22/2018	296	1.80 J	26.9
		4/2/2019	254	1.50 J	25.2
		10/9/2019	246	1.10 J	16.7
		5/29/2020	611	1.20 J	34.6
		10/8/2020	648	1.10 J	36.5
		4/13/2021	521	1.40 J	36.9
		10/14/2021	495	1.30 J	37.8
		4/12/2022	389	0.79 J	22.1 M0
	10/27/2022	374	2.1	30.3	
	4/27/2023	541	1.3 J	36.6	
	MW-33AR	12/21/2015	954	10.6	96.2
		4/5/2016	813	12.5	91.5
		7/7/2016	794	12.5	99.2
		10/13/2016	827	52.5	124
		12/29/2016	812	39.6	132
		1/25/2017	763	41.4	133
		4/11/2017	760	47.1	139
		6/6/2017	692	68.1	151
		8/7/2017	697	105	164
		10/24/2017	678	119	175
		4/24/2018	601	188	163
		9/21/2018	683	32.6	124
10/22/2018		682	14.4	112	
4/2/2019		568	229	201	
10/8/2019	548	153	182		
5/28/2020	566	15.9	104		
10/8/2020	569	27.3	97.4		
4/13/2021	473	26.9	94.3		
6/11/2021	--	--	--		
10/12/2021	564	22.6	96.4		
4/12/2022	558	59.0	155		
10/27/2022	586	40.5	153		
4/27/2023	532	19.0	104		

**Table 2. Historical Analytical Results for Parameters with SSIs
Columbia Dry ADF, Modules 1-3**

Well Group	Well	Collection Date	Boron (µg/L)	Chloride (mg/L)	Sulfate (mg/L)
Compliance	MW-34A	12/21/2015	230	4.90	69.9
		4/5/2016	220	5.10	71.6
		7/7/2016	216	5.60	63.4
		7/28/2016	--	--	--
		10/13/2016	212	6.80	54.8
		12/29/2016	224	7.10	63.9
		1/25/2017	214	7.20	71.2
		4/11/2017	214	6.20	87.6
		6/6/2017	201	7.80	106
		8/7/2017	205	7.40	105
		10/24/2017	208	7.60	98.0
		4/24/2018	209	8.20	144
		9/21/2018	241	17.1	141
		10/22/2018	233	19.9	123
		4/4/2019	204	18.7	70.4
		10/8/2019	207	57.9	39.8
		5/28/2020	210	3.90	44.4
		10/8/2020	213	2.10	58.7
		4/13/2021	203	2.30	59.3
		6/11/2022	--	--	--
		10/12/2021	212	1.90 J, M0	56.1
		4/12/2022	237	2.20	146
	10/27/2022	264	2.20	169	
4/28/2023	220	2.0	48.4		
	MW-1AR ⁽²⁾	4/14/2021	16.1	1.50 J	4.40 M0
		10/14/2021	12.4	1.20 J	3.10

Abbreviations:

µg/L = micrograms per liter or parts per billion (ppb)

mg/L = milligrams per liter or parts per million (ppm)

J = Estimated value below the laboratory's limit of quantitation

B = Analyte was detected in the associated Method Blank.

M0 = matrix spike recovery and/or matrix spike duplicate recovery outside of laboratory control limits.

Notes:

(1) Analytical laboratory reports provided in the Annual Groundwater Monitoring and Corrective Action Reports.

(2) MW-1AR was added to the sampling network in 2021 to provide additional evaluation of site conditions in the CCR unit. MW-1AR was abandoned in March of 2022.

Created by:	<u>NDK</u>	Date:	<u>3/19/2020</u>
Last revision by:	<u>NLB</u>	Date:	<u>9/20/2023</u>
Checked by:	<u>RM</u>	Date:	<u>10/3/2023</u>
PM/Scientist Check:	<u>TK</u>	Date:	<u>11/11/2023</u>

**Table 4. Analytical Results - Lysimeters and Leachate Pond
Columbia Dry Ash Disposal Facility
SCS Engineers Project #25223067.00**

Monitoring Point	Monitoring Period	Monitoring Point Dry/ Broken	Boron, Total (µg/L)	Chloride, Total (mg/L)	Sulfate, Total (mg/L)
LS-1	2015-Apr	DRY	--	--	--
	2015-Oct	BROKEN	--	--	--
	2016-Apr	DRY	--	--	--
	2016-Oct	--	6,530	12.3	789
	2017-Apr	--	6,510	20.7 J	814
	2017-Oct	--	6,200	14.2 J	764
	2018-Apr	--	5,920	16.0 J	856
	2018-Oct	DRY	--	--	--
	2019-Apr	--	5,640	22.0 J	911
	2019-Oct	--	6,180	19.2 J	861
	2020-May	--	6,180	25.4 J	1,040
	2020-Oct	--	5,640	27.2 J	950
	2021-Apr	--	6,010	21.1 J	976
	2021-Oct	--	6,230	14.3 J	987
	2022-Apr	--	6,140	13.3 J	1,040
	2022-Oct	--	6,000	16.7 J	898
2023-Apr	--	6,200	27.1 J	969	
LS-3R	2015-Apr	--	6,480	20.6 B	807
	2015-Oct	DRY	--	--	--
	2016-Apr	DRY	--	--	--
	2016-Oct	DRY	--	--	--
	2017-Apr	DRY	--	--	--
	2017-Oct	DRY	--	--	--
	2018-Apr	DRY	--	--	--
	2018-Oct	--	6,180	26.2 J	841
	2019-Apr	DRY	--	--	--
	2019-Oct	DRY	--	--	--
	2020-May	DRY	--	--	--
	2020-Oct	DRY	--	--	--
	2021-Apr	DRY	--	--	--
	2021-Oct	DRY	--	--	--
	2022-Apr	DRY	--	--	--
	2022-Oct	DRY	--	--	--
2023-Apr	DRY	--	--	--	

**Table 4. Analytical Results - Lysimeters and Leachate Pond
Columbia Dry Ash Disposal Facility
SCS Engineers Project #25223067.00**

Monitoring Point	Monitoring Period	Monitoring Point Dry/ Broken	Boron, Total (µg/L)	Chloride, Total (mg/L)	Sulfate, Total (mg/L)
LP-1	2015-Apr	--	4,060	27.8	734
	2015-Oct	--	4,300	37.1	820
	2016-Apr	--	1,830	26.8	416
	2016-Oct	--	4,610	71.5	835
	2017-Apr	--	2,690	66.3	587
	2017-Oct	--	4,970	91.7	739
	2018-Apr	--	2,060	63.2	634
	2018-Oct	--	2,630	151	907
	2019-Apr	--	570	35.1	249
	2019-Oct	--	1,270	63.9	602
	2020-May	--	2,460	179	952
	2020-Oct	--	2,710	243	1,160
	2021-Apr	--	3,340	319	1,180
	2021-Oct	--	3,440	299	1,470
	2022-Apr	--	1,030	89.2	506
2022-Oct	--	2,040	175	752	
2023-Apr	--	2,110	404	856	

Abbreviations:

µg/L = micrograms per liter
mg/L = milligrams per liter

-- = not analyzed

Notes:

B = Analyte was detected in the associated method blank.

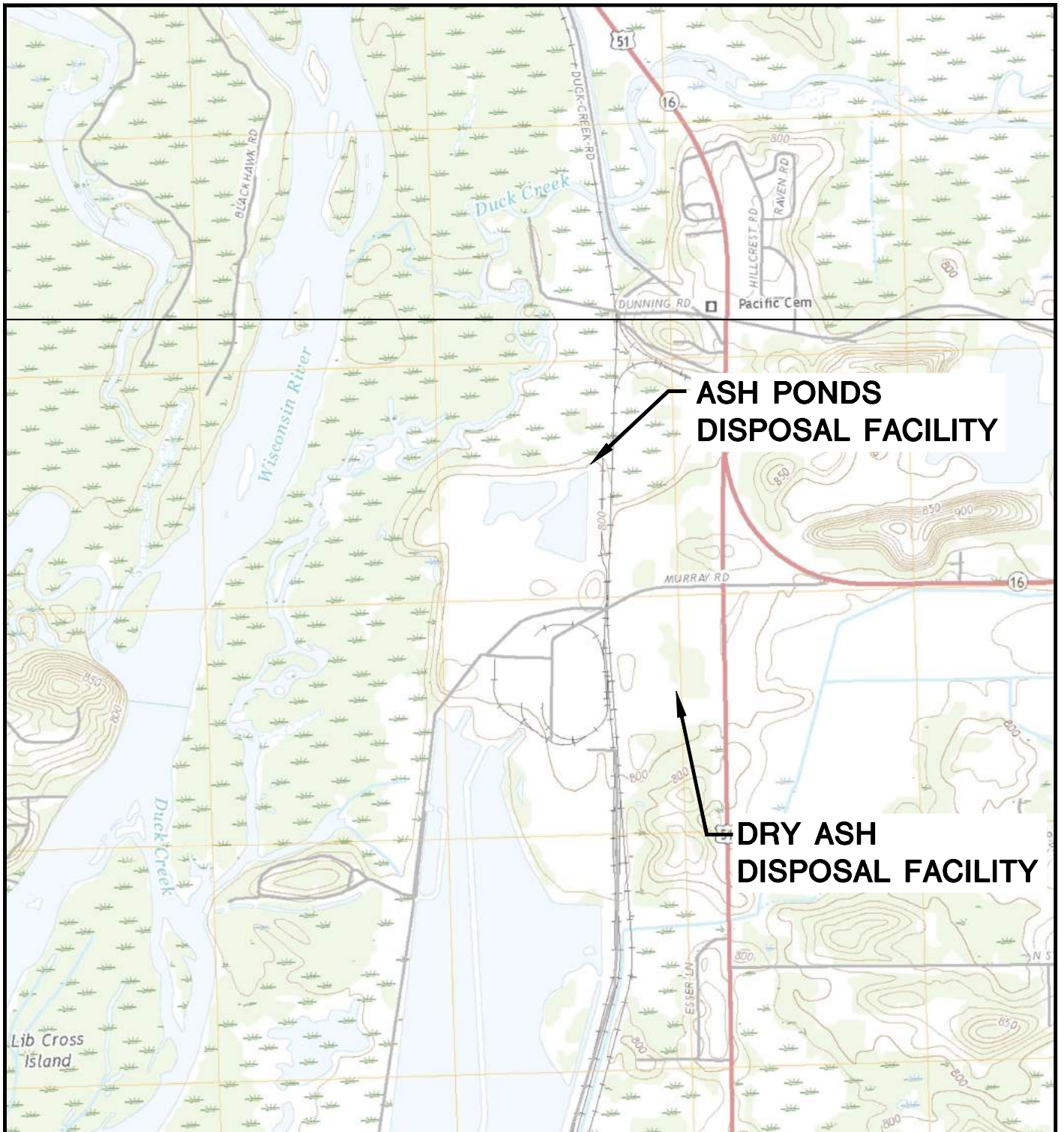
J = Estimated concentration at or above the Limit of Detection (LOD) and below the Limit of Quantitation (LOQ).

Created by: MDB
Last revision by: NLB
Checked by: RM

Date: 12/1/2014
Date: 10/3/2023
Date: 10/3/2023

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – April 2023



**ASH PONDS
DISPOSAL FACILITY**

**DRY ASH
DISPOSAL FACILITY**

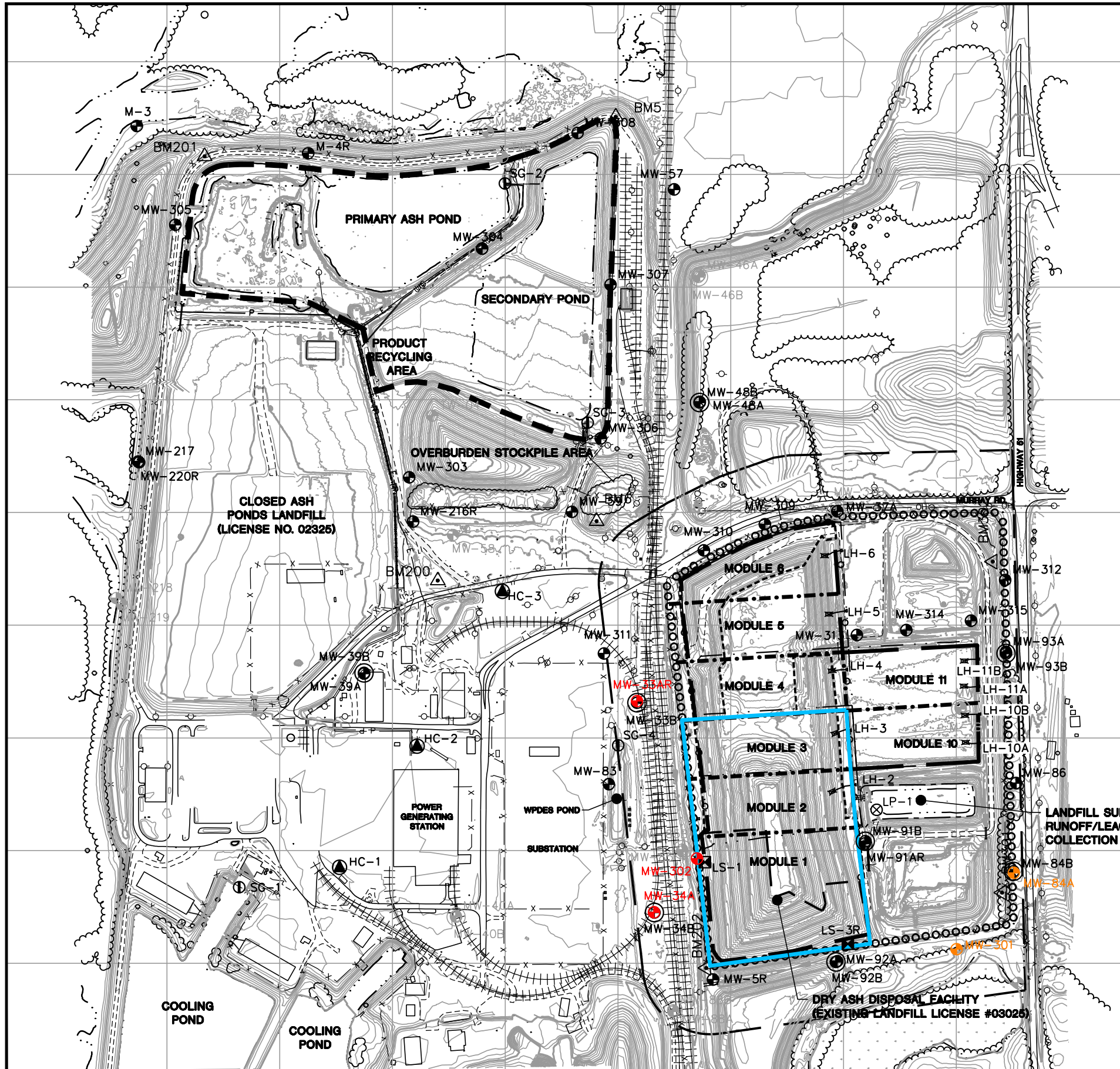


POYNETTE QUADRANGLE
WISCONSIN-COLUMBIA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



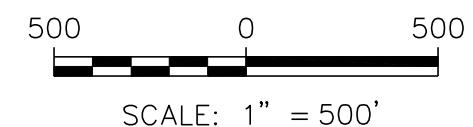
CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25223067.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
	DRAWN:	12/02/2019		CHECKED BY:	TK			1
REVISED:	05/01/2023	APPROVED BY:	TK 11/11/2023					

I:\25223067.00\Drawings\Site Location Map.dwg, 10/12/2023 9:55:52 AM



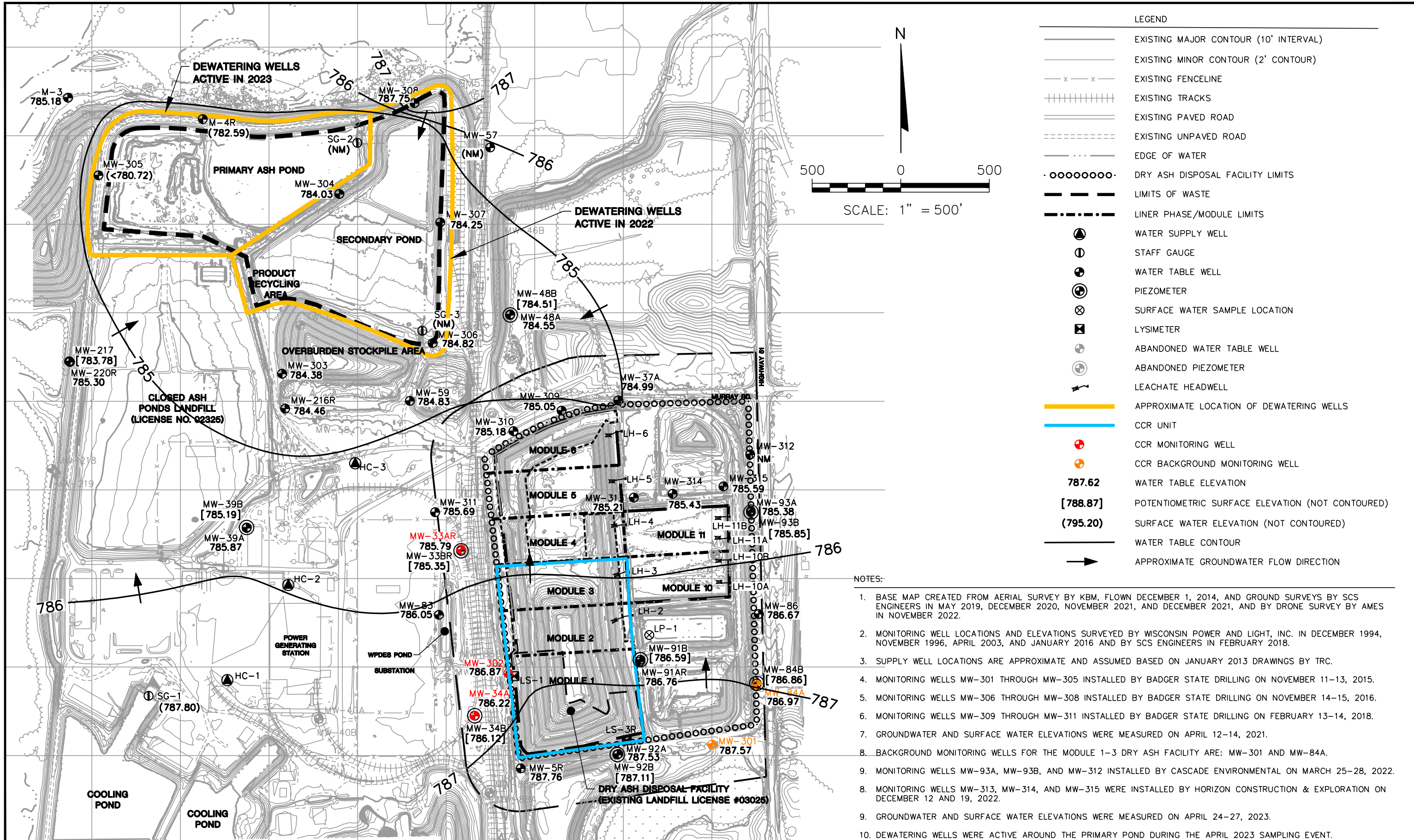
- LEGEND**
- (solid line) — EXISTING MAJOR CONTOUR (10' INTERVAL)
 - (dashed line) — EXISTING MINOR CONTOUR (2' CONTOUR)
 - x - x - EXISTING FENCELINE
 - ||||| EXISTING TRACKS
 - ==== EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - ... --- EDGE OF WATER
 - DRY ASH DISPOSAL FACILITY LIMITS
 - — — — — 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
 - (blue line) — CCR UNIT
 - ⊕ (red) CCR MONITORING WELL
 - ⊕ (orange) 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 WELLS MW-313, MW-314, AND MW-315 WERE INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON DECEMBER 12 AND 19, 2022.
 9. BACKGROUND MONITORING WELLS FOR THE MODULE 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.



PROJECT NO. 25223067.00	DRAWN BY: KP	 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 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	FIGURE 2
DRAWN: 12/02/2019	CHECKED BY: TK				
REVISED: 10/12/2023	APPROVED BY: TK 11/11/2023				

I:\25223067.00\Drawings\Modules 1-3\Site Plan and Monitoring Well Locations.dwg, 10/12/2023 11:22:45 AM



- 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
 - APPROXIMATE LOCATION OF DEWATERING WELLS
 - 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

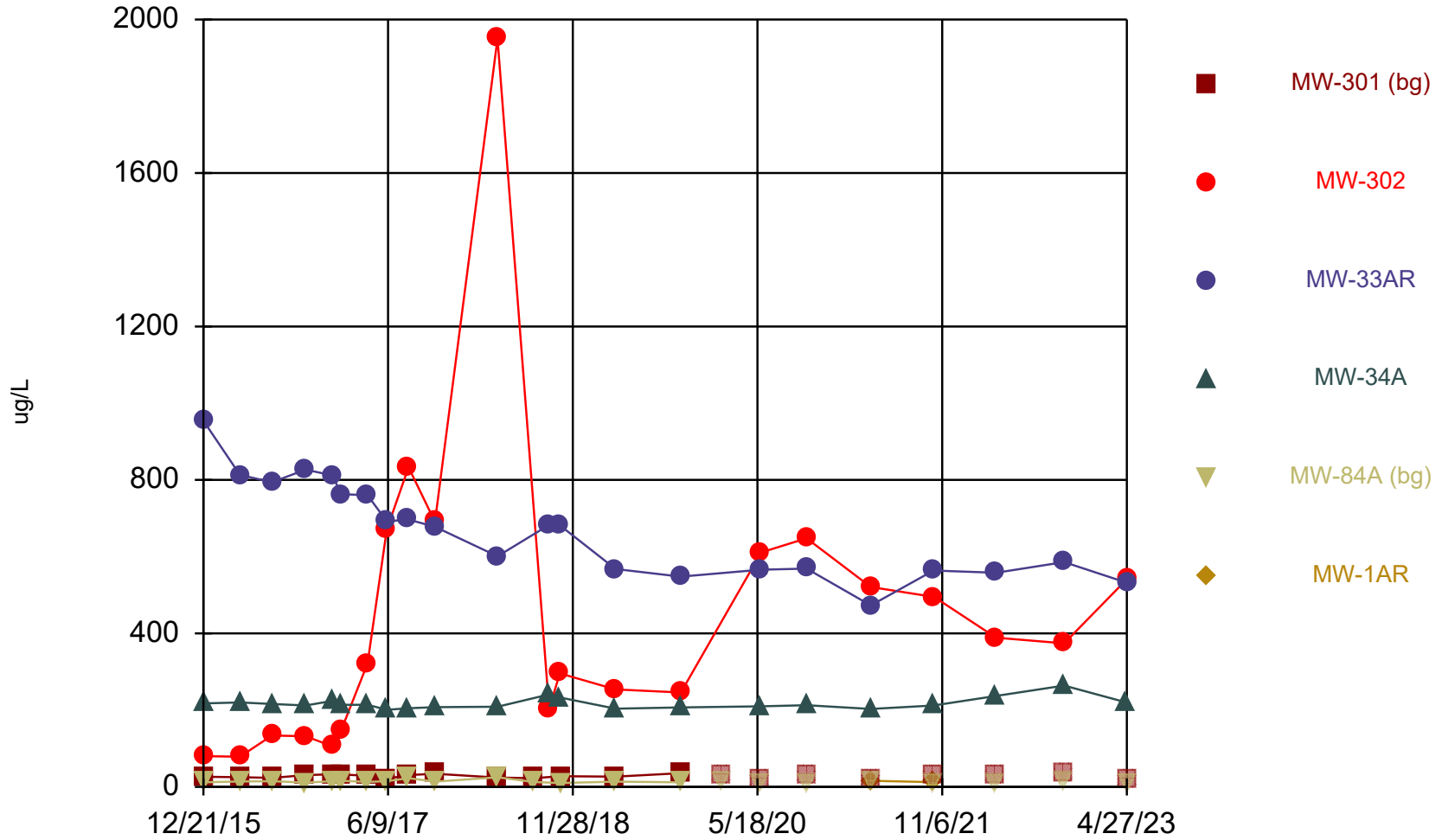
- NOTES:
1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEYS BY SCS ENGINEERS IN MAY 2019, DECEMBER 2020, NOVEMBER 2021, AND DECEMBER 2021, AND BY DRONE SURVEY BY AMES IN NOVEMBER 2022.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND 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 1-3 DRY ASH FACILITY ARE: MW-301 AND MW-84A.
 9. MONITORING WELLS MW-93A, MW-93B, AND MW-312 INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 25-28, 2022.
 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.
 10. DEWATERING WELLS WERE ACTIVE AROUND THE PRIMARY POND DURING THE APRIL 2023 SAMPLING EVENT.

PROJECT NO. 25223067.00	DRAWN BY: KP	ENGINEER		CLIENT	SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954	WATER TABLE MAP APRIL 2023	FIGURE			
DRAWN: 10/12/2023	CHECKED BY: TK								2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	ALLIANT ENERGY COLUMBIA ENERGY CENTER MODULES 1-3 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	3
REVISED: 11/10/2023	APPROVED BY: TK 11/11/2023										

I:\25223067.00\Drawings\Modules 1-3\Water Table Map-April 2023.dwg, 11/10/2023 3:27:53 PM

Appendix A
Trend Plots for CCR Wells

Boron



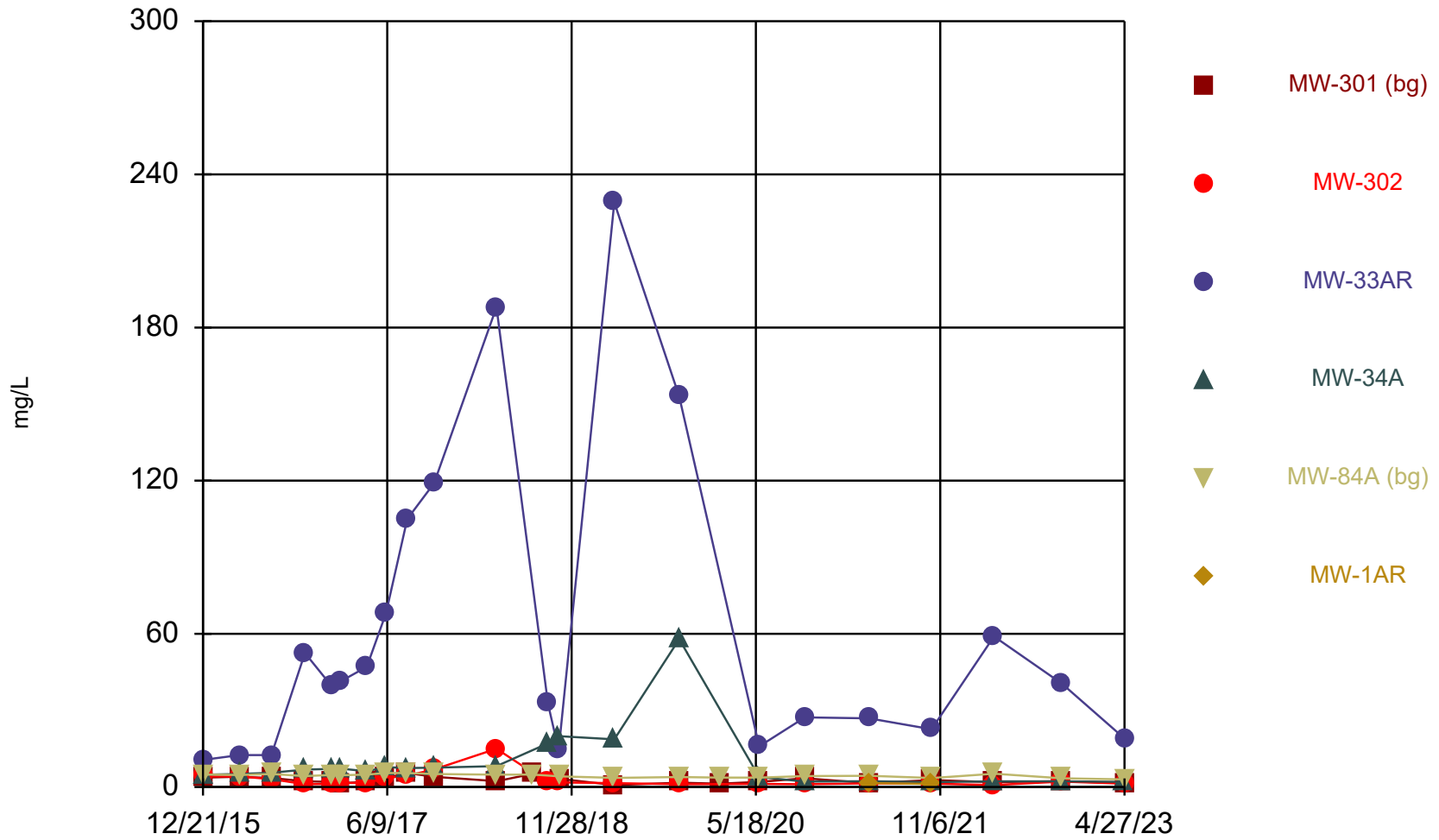
Time Series Analysis Run 10/4/2023 2:00 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 10/4/2023 2:01 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			954	217.5 (D)		
12/22/2015	26.5	80			11.9	
4/5/2016	25.2	78.8	813	220	14	
7/7/2016		134	794	216		
7/8/2016	23.6				14.7	
10/13/2016	30.6	132	827	212	11.1	
12/29/2016	32.8	106	812	224	14.7	
1/25/2017	32.6	149	763	214	16.1	
4/11/2017	28.8	322	760	214	12.9	
6/6/2017	21.3	671	692	201	14.8	
8/7/2017			697	205		
8/8/2017	30.6	833			22.9	
10/23/2017	34.3					
10/24/2017		691	678	208	13.8	
4/24/2018		1950	601	209		
4/25/2018	24.3				25	
8/8/2018	22.8				12.8	
9/21/2018		203	683	241		
10/22/2018		296	682	233		
10/24/2018	27.8				10.1 (J)	
4/2/2019	26.9	254	568	204		
4/3/2019					13.6	
10/8/2019			548	207		
10/9/2019	35.9	246			12	
2/3/2020	27.9				15.7	
5/28/2020			566	210		
5/29/2020	21.3	611			10	
10/8/2020	28.8	648	569	213	9.7 (J)	
4/13/2021		521	473	203		
4/14/2021	22.2				14.3	16.1
10/12/2021			564	212		
10/14/2021	31.4	495			11.1	12.4
4/12/2022		389	558	237		
4/13/2022	28.7				10.5	
10/27/2022	37.5	374	586	264	12.2	
4/26/2023				220		
4/27/2023	20.1	541	532		10.3	

Chloride



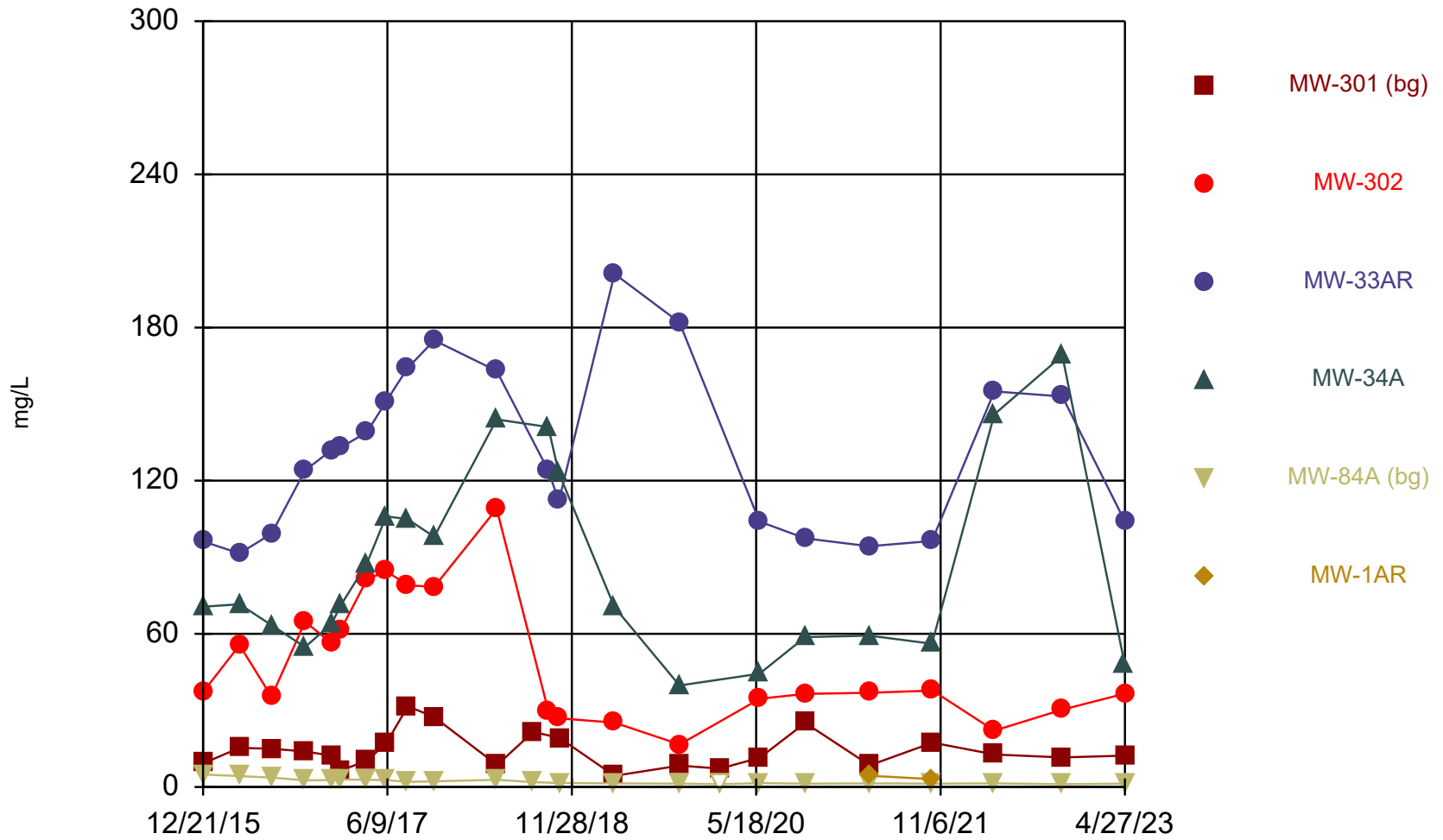
Time Series Analysis Run 10/4/2023 2:00 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Chloride (mg/L) Analysis Run 10/4/2023 2:01 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			10.6	4.85 (D)		
12/22/2015	3.7 (J)	4.2			4.9	
4/5/2016	4	4.1	12.5	5.1	4.7	
7/7/2016		3.1 (J)	12.5	5.6		
7/8/2016	3.5 (J)				5.1	
10/13/2016	2.2	1.1 (J)	52.5	6.8	4.3	
12/29/2016	2 (J)	1.2 (J)	39.6	7.1	4.7	
1/25/2017	1.5 (J)	1.6 (J)	41.4	7.2	4.6	
4/11/2017	2	1.6 (J)	47.1	6.2	4.9	
6/6/2017	3.5	3.5	68.1	7.8	5.5	
8/7/2017			105	7.4		
8/8/2017	5.5	4.5			5.5	
10/23/2017	4					
10/24/2017		6.9	119	7.6	5.1	
4/24/2018		15	188	8.2		
4/25/2018	2.3				4.8	
8/8/2018	5.2				4.9	
9/21/2018		1.7 (J)	32.6	17.1		
10/22/2018		1.8 (J)	14.4	19.9		
10/24/2018	3.2				4.2	
4/2/2019	0.79 (J)	1.5 (J)	229	18.7		
4/3/2019					3.6	
10/8/2019			153	57.9		
10/9/2019	1.7 (J)	1.1 (J)			3.9	
2/3/2020	1.3 (J)				3.7	
5/28/2020			15.9	3.9		
5/29/2020	2 (J)	1.2 (J)			3.7	
10/8/2020	3.4	1.1 (J)	27.3	2.1	4.3	
4/13/2021		1.4 (J)	26.9	2.3		
4/14/2021	1.5 (J)				4.4	1.5 (J)
10/12/2021			22.6	1.9 (J)		
10/14/2021	2.7	1.3 (J)			3.5	1.2 (J)
4/12/2022		0.79 (J)	59	2.2		
4/13/2022	1.9 (J)				5.2	
10/27/2022	2.3	2.1	40.5	2.2	3.4	
4/26/2023				2		
4/27/2023	1.5 (J)	1.3 (J)	19		3	

Sulfate




Time Series Analysis Run 10/4/2023 2:00 PM View: COL Secondary Pond
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Sulfate (mg/L) Analysis Run 10/4/2023 2:01 PM View: COL Secondary Pond
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

	MW-301 (bg)	MW-302	MW-33AR	MW-34A	MW-84A (bg)	MW-1AR
12/21/2015			96.2	70.6 (D)		
12/22/2015	9.3	37.4			4.9	
4/5/2016	15.3	55.6	91.5	71.6	4.3	
7/7/2016		35.4	99.2	63.4		
7/8/2016	15				3.7 (J)	
10/13/2016	13.9	64.7	124	54.8	2.6 (J)	
12/29/2016	12.3 (J)	56.4	132	63.9	2.7 (J)	
1/25/2017	6.5	61.6	133	71.2	3	
4/11/2017	10.3	81.3	139	87.6	2.8 (J)	
6/6/2017	17.1	84.6	151	106	2.7 (J)	
8/7/2017			164	105		
8/8/2017	31.6	79			2 (J)	
10/23/2017	27.5					
10/24/2017		78.4	175	98	2.2 (J)	
4/24/2018		109	163	144		
4/25/2018	8.6				2.8 (J)	
8/8/2018	21.6				1.9 (J)	
9/21/2018		30	124	141		
10/22/2018		26.9	112	123		
10/24/2018	19.2				1.6 (J)	
4/2/2019	4.4	25.2	201	70.4		
4/3/2019					1.4 (J)	
10/8/2019			182	39.8		
10/9/2019	8.4	16.7			1.3 (J)	
2/3/2020	7.2				<2.2 (U)	
5/28/2020			104	44.4		
5/29/2020	11.5	34.6			1.5 (J)	
10/8/2020	25.1	36.5	97.4	58.7	1.3 (J)	
4/13/2021		36.9	94.3	59.3		
4/14/2021	8.5				1.4 (J)	4.4
10/12/2021			96.4	56.1		
10/14/2021	17.4	37.8			1.3 (J)	3.1
4/12/2022		22.1	155	146		
4/13/2022	12.7				1.4 (J)	
10/27/2022	11.6	30.3	153	169	1.1 (J)	
4/26/2023				48.4		
4/27/2023	12.3	36.6	104		1.3 (J)	



Appendix B
Feasibility Study Water Quality Information

1370



FEASIBILITY STUDY
PROPOSED FLY ASH AND/OR SCRUBBER SLUDGE
DISPOSAL FACILITY-COLUMBIA SITE
WISCONSIN POWER AND LIGHT COMPANY
TOWN OF PACIFIC, COLUMBIA COUNTY, WISCONSIN

Jan 78

C 7134

conceivable that groundwater flow in the area north of Murray Road may be altered such that contaminants derived from the present ash settling basin might be diverted southerly towards the homes along Murray Road. These questions would have to be addressed in greater detail, consistent with the goals of Wisconsin Power and Light Company.

WATER QUALITY

During the first two weeks of December, 1977, 64 water samples were obtained from surface waters and groundwater monitoring wells at the Columbia Energy Center. The purpose of the sampling was to assess background water quality in the vicinity of the proposed disposal site. The sampling stations included 59 monitoring wells, the cooling lake, ash settling pond, the drainage ditch carrying the ash pond discharge waters and the agricultural drainage ditch along the southern boundary of the site. Due to the large number of sampling stations, the analyses were limited to pH, specific conductance, iron, calcium, magnesium, sulfate and chloride. The analytical data is contained in Appendix F and is discussed below.

pH

Most groundwaters found in the United States have pH values ranging from around 6.0 to 8.5. The pH of a water represents the result of a number of interrelated chemical equilibria. This equilibria can be altered shortly after sampling by gains or losses of carbon dioxide, the oxidation of ferrous iron and numerous other chemical reactions. Thus, pH measurements must be taken shortly after obtaining the sample. For this study, the pH of samples was determined immediately upon return to the laboratory.

Within the proposed site boundaries at the Columbia Energy Center, pH values ranged between 6.3 and 8.1 and averaged 7.5. Typically, the lower pH values were observed in the lowland areas and wetlands, probably as a result of acidic organic soils. The pH of water in the ash disposal settling pond and the cooling lake was 11.4 and 8.3, respectively.

SPECIFIC CONDUCTANCE

Specific conductance, or conductivity, is the ability of a substance to conduct an electric current. The conductance determination is correlative with the dissolved-solids concentration. Conductivity, however, is temperature dependent and thus requires the reference of specific conductance measurements to a standard temperature. The values discussed here are referred to 25°C.

The specific conductance of groundwater in the study area ranged from 220 umhos/cm to a maximum of 2600 umhos/cm. The highest conductivity readings were observed in monitoring wells located along the coal storage area and the drainage ditch carrying the ash pond discharge where values up to 2600 umhos/cm were measured. The conductivity of the ash pond effluent was 1380 umhos/cm. This data appears to confirm earlier speculation of infiltration of effluent from the ash pond discharge channel and from the coal storage area into the groundwater. Conductance within the proposed site boundaries averaged approximately 465 umhos/cm.

Conductivity in the ash disposal settling pond was measured at 1510 umhos/cm. Shallow monitoring wells M-6 and 39A, located adjacent to the pond also exhibited elevated values of 1160 umhos/cm and 1800 umhos/cm, respectively.

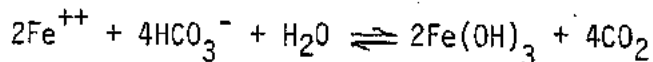
High conductivities were also observed along U. S. Highway 51 at monitoring wells 51A and 51B. The chloride data, discussed below, indicates infiltration of road salt has probably occurred at this location.

Specific conductance measurements obtained in the vicinity of the proposed disposal site are shown on Drawing C 7134-15.

IRON

The element iron is an abundant element found in most rocks and soil. It generally occurs as sulfides and oxides in igneous and metamorphic rocks and as iron oxide and hydroxide cementing materials in coarse-grained sedimentary rocks.

Ferrous iron is unstable in the presence of oxygen where it is bound to hydroxide anions as $2\text{Fe}(\text{OH})_3$.



If subjected to a strong reducing environment, such as a marsh, the reaction is reversed and iron goes back into solution. The amount which dissolves is related to a number of variables including the velocity with which water moves through this environment.

The U. S. Public Health Service recommends an iron concentration of less than 0.3 mg/l in water used for drinking and culinary purposes. Laundry and porcelain tend to be stained when concentrations reach 0.5 to 1.0 mg/l. At this level it can also be tasted.

The presence of iron under the proposed disposal area in the majority of cases was below the detection limit of 0.1 mg/l. In monitoring wells 5 and 18, located in or near the central marsh area, iron increased to 10 mg/l and 5.7 mg/l, respectively. In the southern marsh, monitoring wells exhibited concentrations between 0.5 mg/l and 6.1 mg/l. Although the iron concentration in the cooling lake was below the detection limit, down-gradient wells 44 and 30A located on the cooling lake dike yielded values of 11 mg/l and 26 mg/l iron respectively. Boring logs indicated trace amounts of organic material at the base of the dike which is probably the reason for the high concentrations observed. At the same location, iron in well 30B installed to a depth of 100 feet below the surface was below 0.1 mg/l. Thus, the occurrence of high iron concentrations in this area appears restricted to groundwater in the upper portion of the aquifer where organic material is present and conditions are favorable for the dissolution of iron.

The ash pond discharge in the drainage ditch paralleling the west site boundary showed an iron concentration of 3.7 mg/l. Shallow monitoring wells 33A and 34A adjacent to the ditch indicated less than 0.1 mg/l iron.

North of Murray Road the iron concentration in monitoring wells in the marsh and uplands were typically less than 0.1 mg/l. Although the ash basin had less than 0.1 mg/l iron, several wells along cross-section F-F' showed anomalously high values (#M6-2.3 mg/l; #47-16 mg/l; #51B-21 mg/l).

CALCIUM

Calcium, because of its relative abundance and mobility, is the principle cation in most natural fresh water. Calcium is a constituent of many rock types but is found in greatest quantities in waters leaching deposits of limestone and dolomite. In sandstone and other detrital rock, calcium carbonate is a common cement between grains.

Monitoring wells located within the site boundaries exhibited calcium concentrations between 30 mg/l and 66 mg/l and averaged about 42 mg/l. Similar to iron, the concentrations of calcium in monitoring wells along cross-section F-F' were anomalously high, up to 150 mg/l calcium. Water table wells along the drainage ditch carrying the ash pond discharge averaged 83 mg/l while the ash pond effluent contained 28 mg/l. Generally the amount of calcium in groundwater decreased with depth. Nested monitoring wells typically showed somewhat lower concentrations of calcium in the deeper wells.

MAGNESIUM

As a relatively abundant element on the earth's crust, the principle sources of magnesium in natural waters are considered to be ferromagnesian minerals in igneous rocks and magnesium carbonate in carbonate rocks (limestone and dolomite). Waters in which magnesium is the predominant cation are somewhat unusual. Like calcium, magnesium imparts the property of hardness to water and is, therefore, of concern to industrial users.

Generally, concentrations of magnesium were 1/3 to 1/2 of the calcium levels. Magnesium concentrations within the site boundaries ranged between 10 mg/l and 36 mg/l and averaged 27 mg/l. Similar to calcium and iron, higher magnesium values were observed, in general, north of Murray Road and especially in monitoring wells along cross-section F-F'.



SULFATE

Sulphur is widely distributed in reduced form in both igneous and sedimentary rocks as metallic sulfides and when present in sufficient concentrations, constitutes ore of economic importance. During weathering processes with aerated water, the sulfides are oxidized to sulfate ions and are dissolved into water. Pyrite (FeS_2) crystals often occur in sedimentary rocks and are particularly associated with biogenic deposits such as coal which were deposited under strongly reducing conditions.

The concentrations of sulfate in groundwater in the vicinity of the proposed disposal site ranged from less than 1 mg./l to 1,200 mg./l of sulfate. (Refer to Drawing C 7134-15.) Typically, within the site boundaries concentrations averaged approximately 12 mg./l. Near the coal storage area, however, significant increases were observed. Observation wells 26A, 26B, and 42 exhibited concentrations between 900 and 1100 mg./l. The depth of sulfate enrichment in groundwater, near the coal pile, appears to extend to considerable depths, indicated by relatively high sulfate concentrations in Well 26B sealed 100 feet below ground surface. The oxidation of pyrite minerals in the coal leaching into the groundwater is probably the major source of the high concentrations observed.

Sulfate concentrations in the ash disposal settling pond were 520 mg./l. In the ditch carrying the ash pond discharge, the effluent is treated with sulfuric acid which results in precipitation of barium sulfate and aluminum hydroxide (personal communication, Merlin Horn, 1978). Consequently, the sulfate concentration of the effluent waters is lowered considerably to 13 mg./l. Well 33A, however, located near the point of effluent discharge, exhibited 1200 mg./l sulfates.

CHLORIDE

Chloride is generally present in much lower concentrations in rocks than many of the other major constituents of natural water. Important sources, however, are associated with sedimentary rocks, particularly the evaporites. The chemical behavior of chloride in natural water is relatively inert compared to the other major ions. There are few oxidation-reduction reactions and no significant chemical complexing reactions which chloride enters into. In addition, chloride ions are not significantly adsorbed on mineral surfaces. For these reasons, chloride is commonly used as a tracer in groundwater.

Chloride concentrations in groundwater in the vicinity of the Columbia Energy Center typically range between 0.5 mg./l and 30 mg./l. The highest concentrations in monitoring wells tended to be located adjacent to U. S. Highway 51 where the use of road salt has resulted in the percolation of chloride into the groundwater. Monitoring Wells 51A and 51B located in a low area north of Murray Road along U. S. Highway 51, yielded chloride concentrations in excess of 200 mg./l. Two other wells, 52A and 19, also located along U. S. Highway 51, yielded values of 30 mg./l and 42.5 mg./l chloride, respectively.

Within the proposed site boundaries, the chloride concentration averaged 7.7 mg./l. Excluding the few wells adjacent to U. S. Highway 51 exhibiting elevated concentrations, no other significant trends in the occurrence of chloride were observed.

SUMMARY

In summary, the groundwater in the vicinity of the proposed disposal site exhibited a somewhat alkaline pH. In lowland areas, the pH was typically below 7.0, probably a result of the presence of acidic organic soils.

Specific conductance within the proposed site averaged 465 umhos/cm. Conductivities up to 2600 umhos/cm were observed, however, in the vicinity of the coal storage area, the present ash disposal pond and ash pond effluent channel where infiltration of water from these sources is occurring into the groundwater system.

The groundwater typically exhibited relatively low iron concentrations although, locally, concentrations in excess of drinking water standards were observed in about 20% of the wells. The occurrence of the higher iron concentrations appears to be related to the presence of organic soils.

Groundwater at the proposed site also tended to exhibit high calculated hardness (216 mg./l) based on average observed values for calcium (42 mg./l) and magnesium (27 mg./l). Dissolution of limestone and dolomite rocks in the glacial drift are the probable sources of these elements in the groundwater.

Enrichment of sulfate in groundwater has occurred as a result of leaching of pyrite (FeS_2) minerals from the coal storage area where concentrations up to 1200 mg./l were observed. The depth of this enrichment appears to extend beyond the maximum depth into the aquifer investigated. Sulfate concentrations decreased rapidly away from the coal storage area to an average of 12 mg./l within the proposed site boundaries. Other local sources of sulfate in groundwater appear to be related to the present ash settling pond.

The concentration of chloride within the proposed site averaged 7.1 mg./l. Higher levels were generally observed in wells adjacent to U. S. Highway 51 where the infiltration of road salt has locally raised chloride concentrations.

The above interpretations are based on one round of water quality sampling only and should be considered as preliminary in nature. High sulfate and chloride concentrations observed at greater depths may be a temporary condition resulting from contamination of spoil backfill materials with coal dust or salt, respectively, during installation of the monitoring well. Future sampling of these monitoring wells will help to distinguish short term contamination from actual conditions existing in the aquifer.

APPENDIX F
WATER QUALITY DATA

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)
1A	7.6	550	17.	6.5	52	37	<0.1
1B	8.05	460	16.	10.5	39	31	<0.1
2	7.8	527	14.	2.5	45	32	<0.1
3A	7.5	548	13.	2.5	58	36	<0.1
3B	8.1	506	14.	7.0	50	34	<0.1
4	7.8	580	10.	4.0	59	34	<0.1
5	6.3	560	210.	12.5	13	29	10
16	7.6	408	12.	1.5	42	28	<0.1
17	6.45	350	30.	16.5	16	13	0.6
18	6.45	380	4.	4.5	33	22	5.7
19	7.9	570	10.	42.5	44	24	<0.1
20	8.0	340	10.	5.0	36	24	<0.1
21	6.9	220	20.	4.5	23	10	0.1
24A	7.45	775	18.	6.0	76	52	0.1
24B	7.85	440	15.	6.0	43	31	0.1
25	8.1	300	10.	2.5	29	20	<0.1
26A	7.2	2100	900	17.0	140	48	1.5
26B	7.5	2600	1100	16.5	43	7.0	0.2
27	7.15	400	6.	8.0	23	18	<0.1
28A	7.75	500	3.	0.5	48	31	<0.1
28B	7.6	480	4.	3.5	39	28	<0.1
29A	7.8	330	16.	1.5	33	21	0.5
30A	6.75	920	64.	11.0	38	30	26
30B	7.6	770	210	21.0	37	19	<0.1
33A	8.2	2500	1200	24.0	83	50	<0.1
33B	7.9	390	22.	6.5	31	27	0.2
34A	7.7	680	140.	10.0	58	45	0.1
34B	7.7	1700	660	15.0	48	22	<0.1
35	6.8	740	<1.0	4.0	66	33	2.9
36	6.8	740	<1.0	3.5	53	35	6.1
37A	7.7	460	9.	4.0	48	31	0.8
37B	7.5	630	73.	7.5	71	35	<0.1
39A	7.5	1800	350	22.0	180	100	0.1
39B	7.9	330	560	20.5	31	22	0.1
40A	8.0	630	140	8.5	43	29	<0.1
40B	8.1	330	17.	3.0	31	22	<0.1
41	6.8	590	16.	11.0	58	27	9.3

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)
42	7.4	2400	900	17.5	50	12	0.5
44	6.9	490	<1.	16.5	39	23	11
45	7.6	390	14.	3.0	40	25	<0.1
46A	7.3	1100	21.	15.5	140	82	<0.1
46B	7.8	470	25.	17.5	40	26	<0.1
47	6.6	1200	3.	8.0	140	40	16
48A	7.3	620	15.	8.0	62	37	<0.1
48B	7.1	520	22.	20.0	43	29	0.2
49	7.15	730	6.	3.5	75	41	<0.1
50A	7.6	520	28.	15.5	51	34	<0.1
50B	7.5	410	21.	18.0	31	21	<0.1
51A	6.1	1850	8.	205.	65	40	<0.1
51B	7.2	1250	23.	275.	57	36	21
52A	7.7	450	16.	30.5	36	17	<0.1
52B	7.4	430	40.	17.5	32	20	<0.1
53	7.75	450	27.	10.5	39	28	<0.1
54A	7.8	350	12.	4.0	34	21	0.1
54B	7.55	390	15.	5.5	40	24	0.1
55B	7.9	340	23.	17.5	32	22	0.1
56	7.8	450	22.	9.5	43	28	0.1
57	7.85	380	17.	7.0	38	24	0.1
M-6	7.0	1160	5.	7.0	150	91	2.3
Cooling Lake	8.3	370	31.	18.0	34	21	<0.1
Ash Pond Effluent	7.45	1380	13.	4.0	28	1.2	3.7
Ash Pond Drainage	11.4	1510	520.	23.5	29	0.2	<0.1
Ditch (A) Drainage	7.8	500	21.	7.0	43	29	<0.1
Ditch (B)	9.05	1780	750	14.0	42	5.4	<0.1

DEC 19 1979

APPENDICES TO

SUPPLEMENTARY FEASIBILITY STUDY REPORT
AND PRELIMINARY ENGINEERING CONCEPTS
COLUMBIA SITE
WISCONSIN POWER AND LIGHT COMPANY
TOWN OF PACIFIC, COLUMBIA COUNTY, WISCONSIN

D. N. R. APPROVED
DATE 9/3/80
Nile Ostenso, Hydro



APPENDIX I

WATER QUALITY DATA - DECEMBER 1978



WATER QUALITY DATA


12/78

C 7134

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
1A	7.3	530	30	3.1	54	35	<0.1	-
1B	7.0	470	67	6.1	49	30	<0.1	-
2	7.25	458	91	<.5	48	24	<0.1	-
3A	7.0	560	36	<.5	61	31	<0.1	-
3B	7.15	530	52	35.7	37	33	<0.1	-
4	7.2	750	69	5.8	49	30	<0.1	-
5	6.35	1,650	670	14.1	14	13	1.7	-
16	6.9	390	69	1.0	49	23	<0.1	-
17	5.55	295	57	16.3	14	8.6	0.2	-
18	5.9	430	10	4.2	47	21	1.1	-
19	7.4	765	75	4.2	51	28	<0.1	-
20	7.4	380	26	1.6	39	26	<0.1	-
21	5.7	250	54	10.4	15	8.3	0.2	-
24A	7.2	730	36	1.6	65	42	<0.1	-
24B	7.2	470	10	7.3	42	28	<0.1	-
25	7.0	335	29	7.8	39	21	0.2	-
26A	7.4	2,250	650	12.6	32	8.6	<0.1	-
26B	6.8	2,530	840	20.8	49	18	<0.1	-
27	6.9	410	24	4.2	40	24	0.4	-
28A	7.2	500	61	0.5	45	28	<0.1	-
28B	7.0	465	6	2.1	39	26	0.1	-
29A	7.1	410	24	3.6	31	22	0.1	-
30A	5.8	1,140	15	<0.5	97	56	38	-
30B	6.65	835	160	14.6	37	20	<0.1	-
33A	7.8	1,970	830	16.7	21	8.9	<0.1	-
33B	7.5	380	31	7.3	24	27	<0.1	-
34A	7.25	560	46	4.2	53	33	<0.1	-
34B	8.5	1,575	730	21.9	28	29	0.1	-
35	6.7	545	61	3.6	60	26	1.0	-
36	6.4	515	5.0	2.6	43	24	4.8	-
37A	7.05	438	30	3.7	50	28	<0.1	-
37B	6.7	325	18	7.3	1.0	0.5	<0.1	-
39A	6.35	1,260	33	13.6	70	7.6	0.1	-
39B	6.7	385	25	4.2	30	21	<0.1	<.05
40A	7.35	483	40	<0.5	48	24	<0.1	-
40B	7.25	343	4	4.2	21	14	<0.1	-
41	6.1	640	54	19.8	43	32	<0.1	-

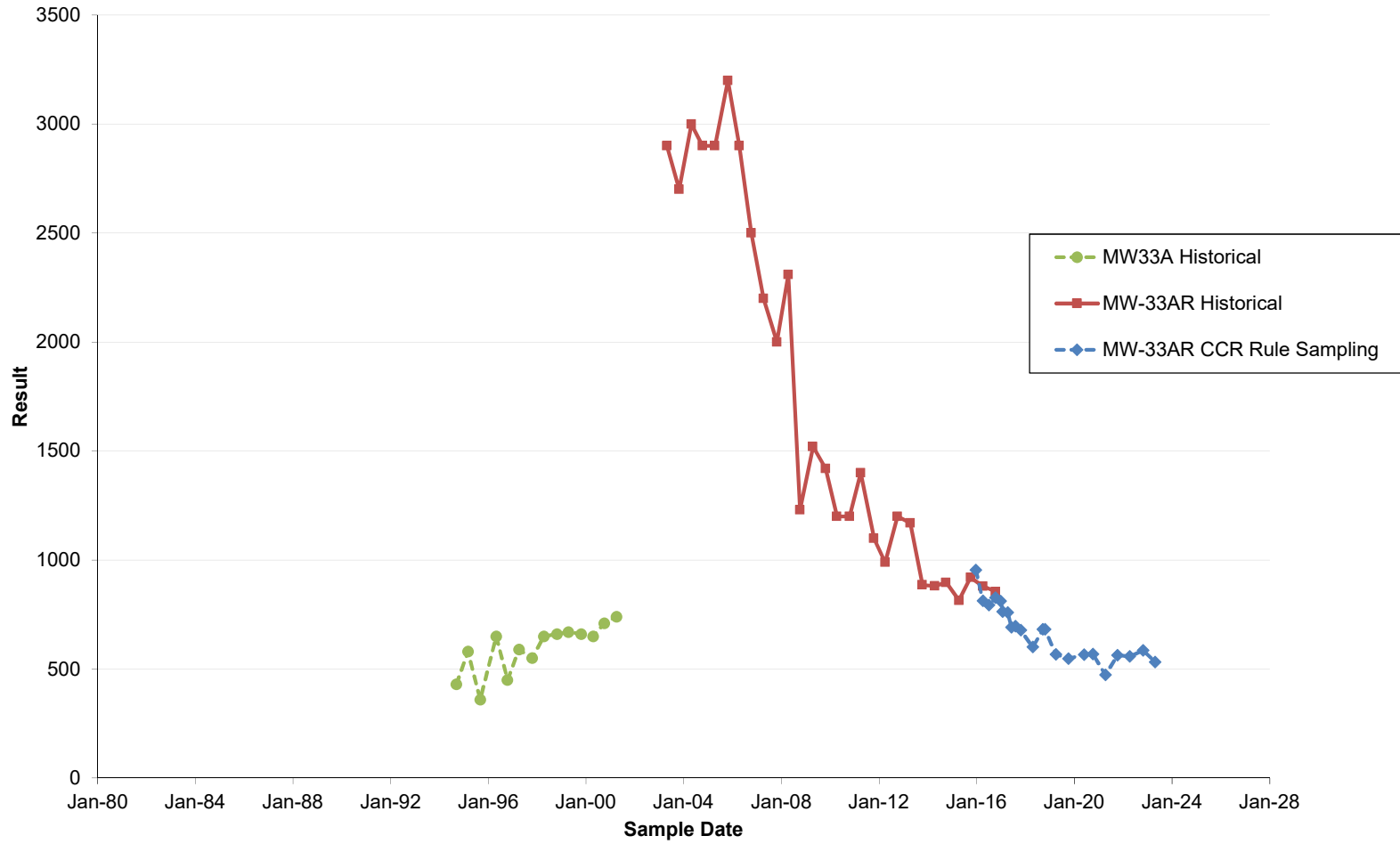
WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
42	7.15	2,050	910	15.6	23	7.5	0.1	-
44	6.15	710	6	0.5	56	27	3.5	-
45	7.2	420	32	1.0	44	26	<0.1	-
46A	7.0	560	93	<0.5	130	75	<0.1	<0.05
46B	6.5	1,290	170	20.8	46	30	<0.1	<0.05
47	7.3	958	120	<0.5	110	48	<0.1	-
48A	6.15	640	59	<0.5	42	51	<0.1	<0.05
48B	6.8	450	23	5.2	40	27	<0.1	<0.05
49	7.0	880	26	2.1	93	58	0.1	-
50A	7.4	660	25	17.7	60	36	<0.1	-
50B	7.1	405	16	17.7	38	23	<0.1	-
51A	7.0	1,170	57	135	66	31	<0.1	-
51B	7.3	1,410	22	330	46	39	<0.1	-
52A	7.0	370	110	18.5	35	10	<0.1	-
52B	7.0	595	43	52.5			0.1	-
53	Frozen							
54A	7.5	345	10	1.0	36	22	<0.1	<0.05
54B	Frozen							
55B	7.3	505	26	15.6	52	29	<0.1	<0.05
56	Frozen							
57	Frozen							
M-6								
58	6.55	1,265	140	<0.5	110	65	0.1	-
59	6.8	925	40	<0.5	86	60	<0.1	-
60	7.2	1,510	54	4.7	130	85	<0.1	-
61A	6.85	590	39	30.2	58	31	<0.1	-
61B	7.2	505	6	13.5	48	29	<0.1	-
62	6.7	1,517	72	178	120	53	<0.1	-
64	6.9	670	100	26.8	63	36	0.8	-
65	7.2	830	57	17.8	78	50	<0.1	-
66	6.5	680	55	40	66	24	3.6	-

WELL NO.	pH	SPECIFIC CONDUCTANCE (umhos/cm @ 25°C)	SULFATE (mg/l)	CHLORIDE (mg/l)	CALCIUM (mg/l)	MAGNESIUM (mg/l)	IRON (mg/l)	BORON (mg/l)
67	7.0	560	100	1.0	57	32	1.0	-
68A	7.6	440	32	2.1	40	27	<0.1	-
68B	7.2	400	36	1.0	42	25	<0.1	-
70A	7.5	440	20	<0.5	27	37	<0.1	-
70B	7.3	520	25	5.2	51	34	<0.1	-
72AZ	6.45	860	11	<0.5	100	41	1.8	-
72B	8.4	230	45	<0.5	17	19	<0.1	-
M-4	7.6	864	180	26.1	20	11	<0.1	0.39
MM-4			2	2.6	14	21	0.9	-
Cooling Lake at 1	7.7	355	36	13.6	31	21.2	<0.1	-
Ash Pond at 2	11.4	3,210	1,100	22.9	34	<0.1	<0.1	-
Ash Pond at 3	8.7	725	34	21.9	48	16	<0.1	-
Ash Pond Effluent at 4	6.7	3,090	1,400	25.0	39	0.4	<0.1	-
Drainage Ditch at 5	7.2	730	74	33.9	56	38	<0.1	-
Drainage Ditch at 6	7.35	2,750	640	18.8	34	7.5	<0.1	-
Drainage Ditch at 7	8.05	1,780	740	27.1	31	0.2	<0.1	-



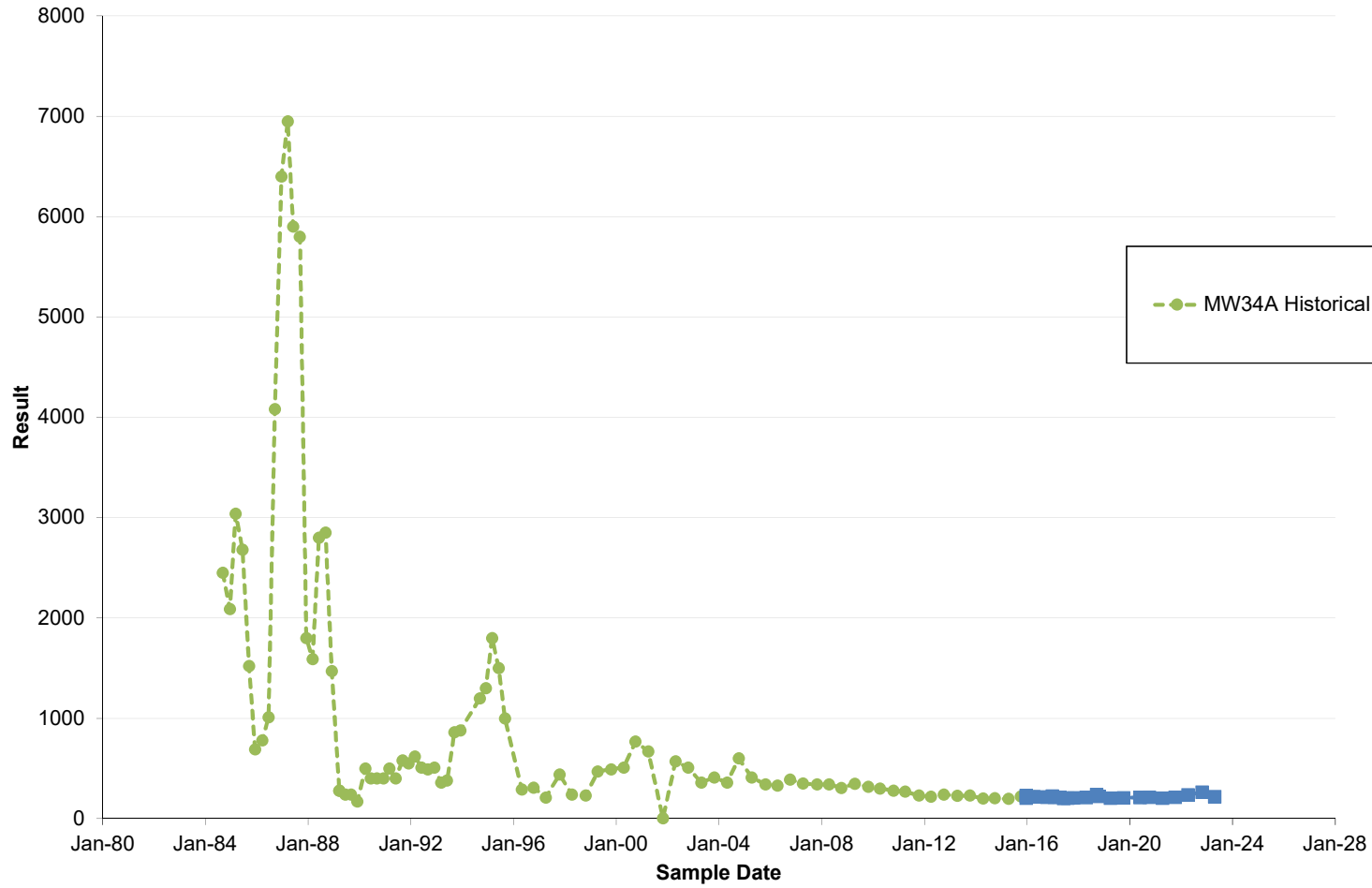
Appendix C
Long-Term Concentration Trend Plots

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33A and MW-33AR - Boron ($\mu\text{g/l as B}$)



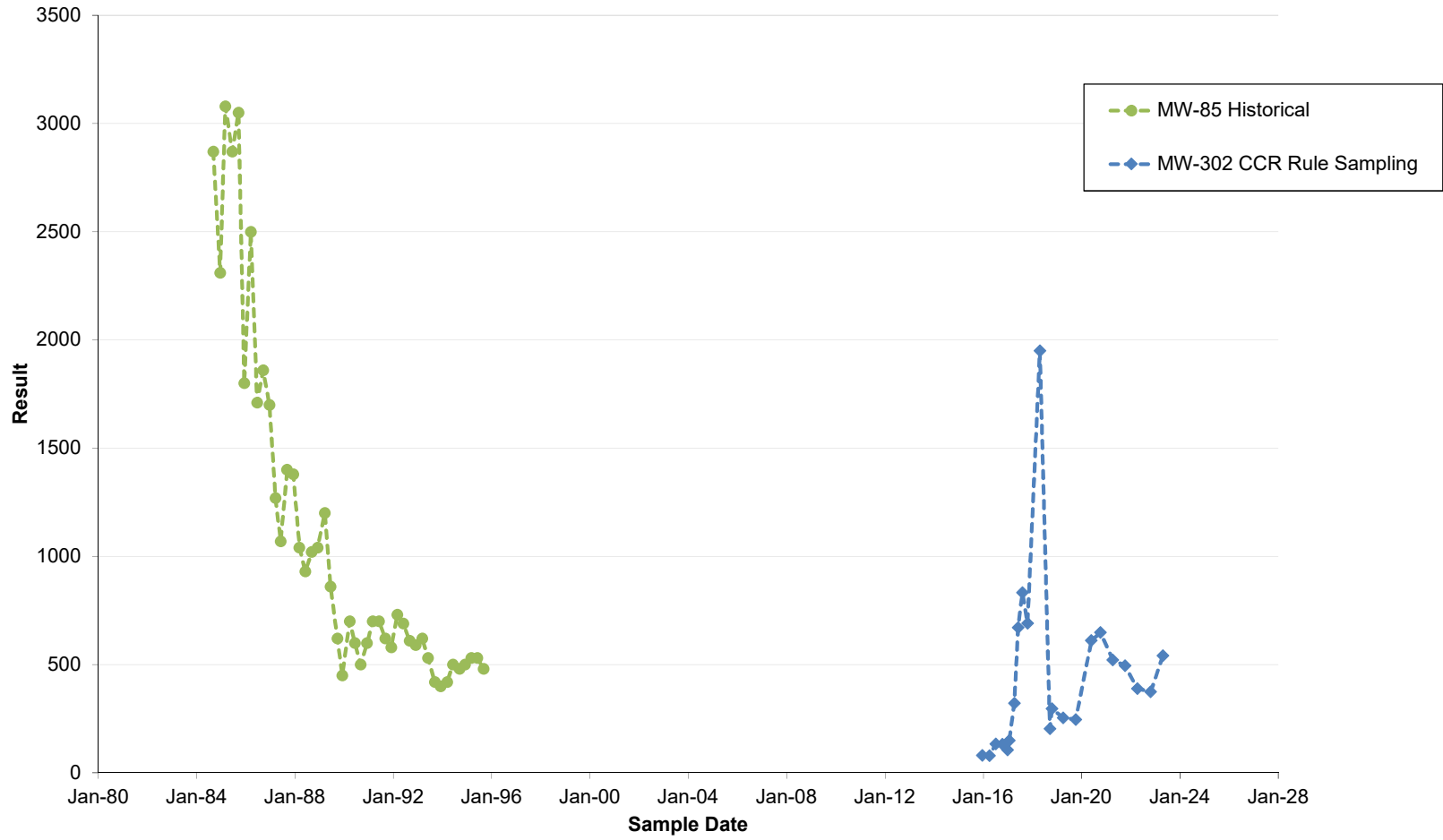
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[Bo_COL Dry.xlsx]MW-33AR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW34A - Boron ($\mu\text{g/l as B}$)



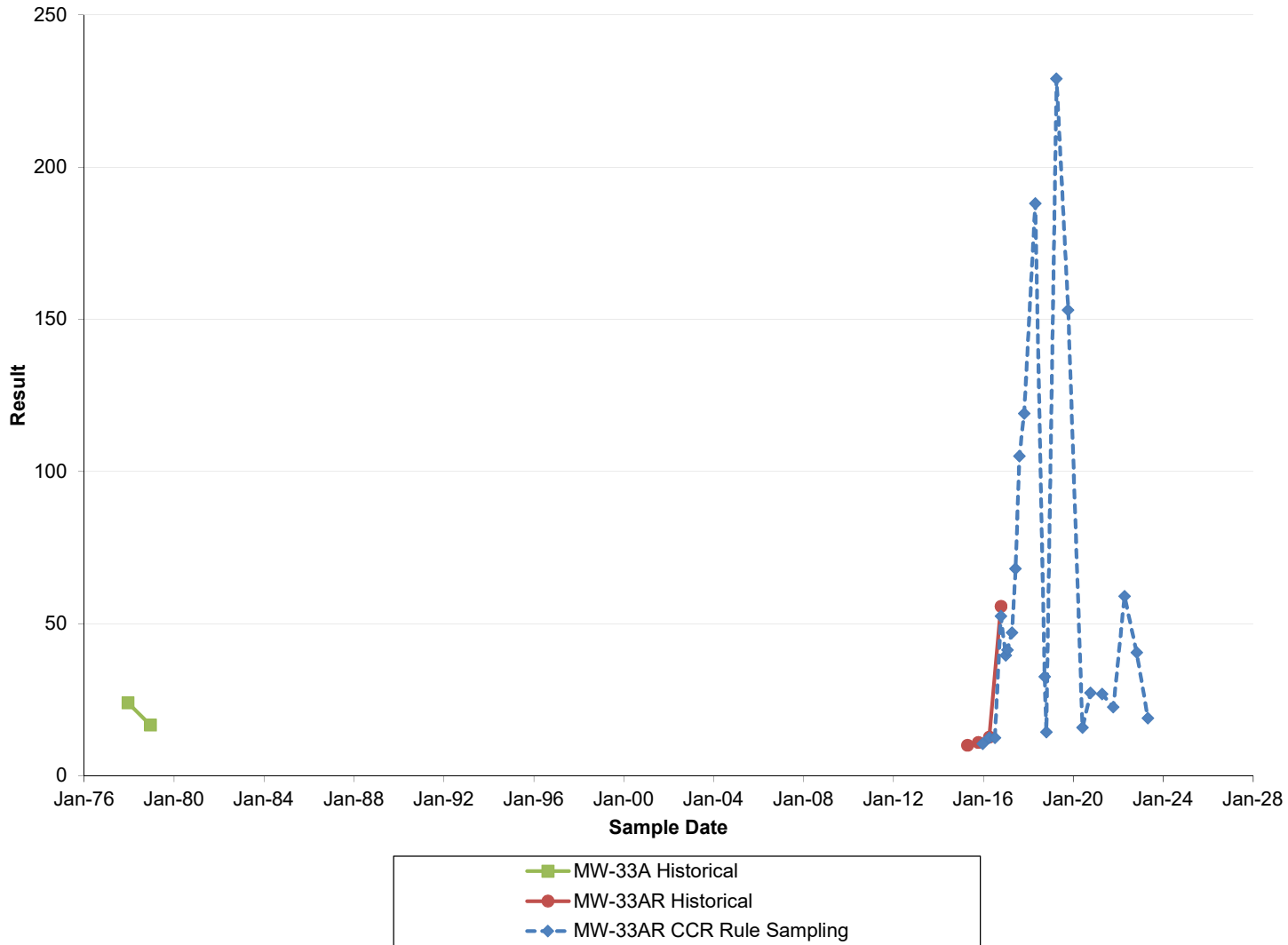
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[Bo_COL Dry.xlsx]MW-34A

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-302 and MW-85 - Boron ($\mu\text{g/l}$ as B)



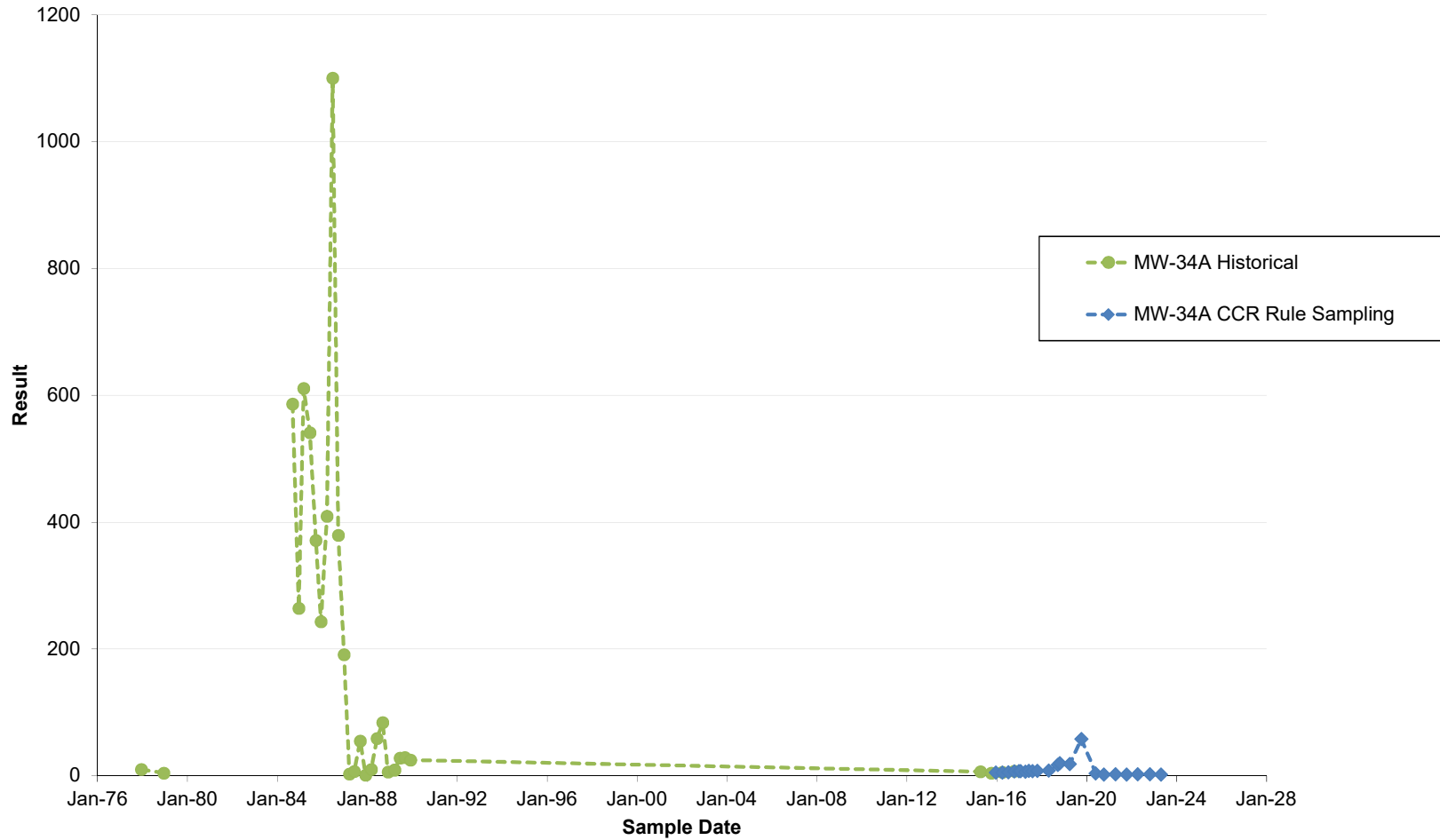
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[Bo_COL Dry.xlsx]MW-85_MW-302

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33 and MW-33AR - Chloride (mg/l as Cl)



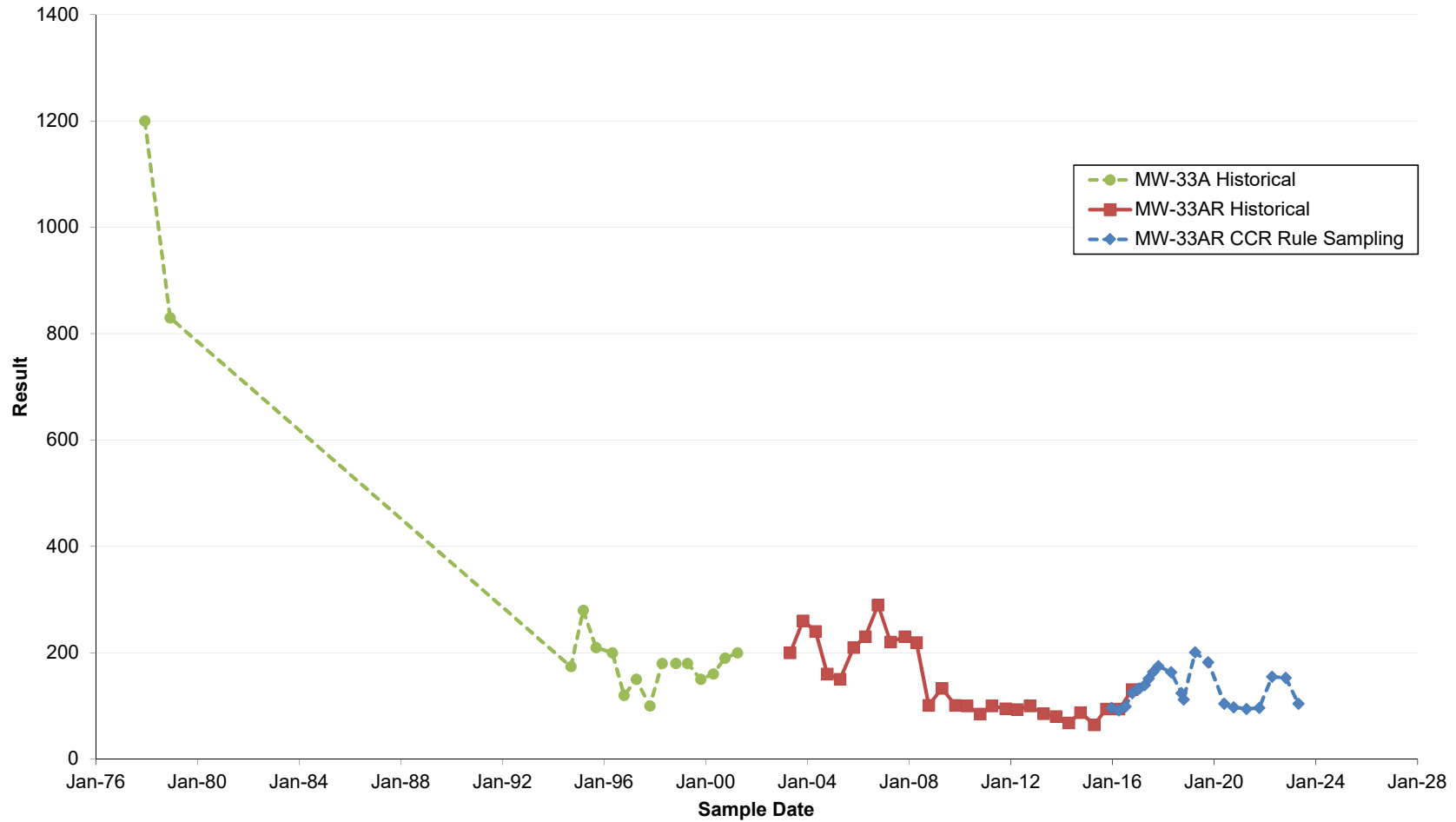
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[Cl_COL Dry.xlsx]MW-33AR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW34A - Chloride (mg/l as Cl)



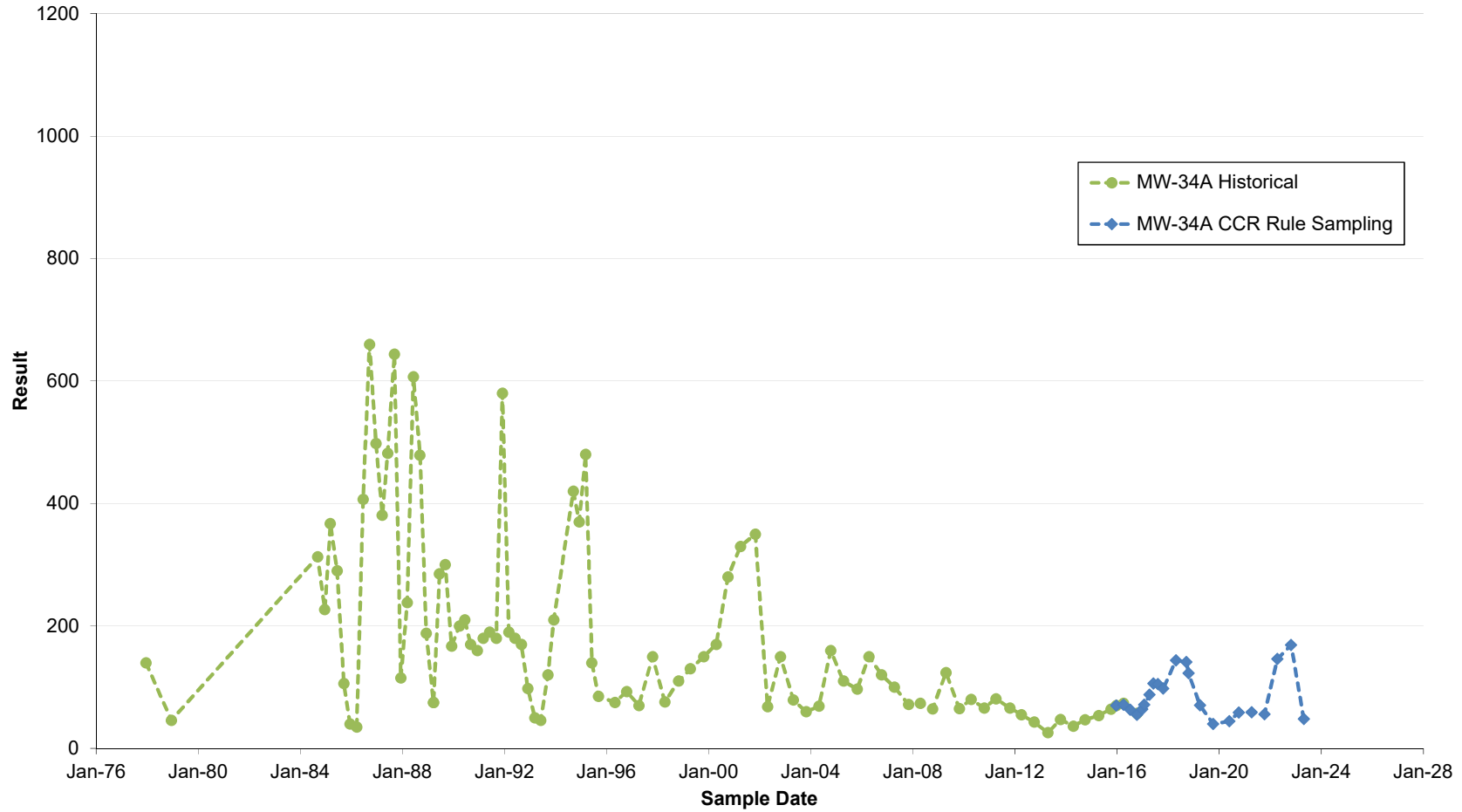
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[Cl_COL Dry.xlsx]MW-34A

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-33 and MW-33AR - Sulfate (mg/l as SO₄)



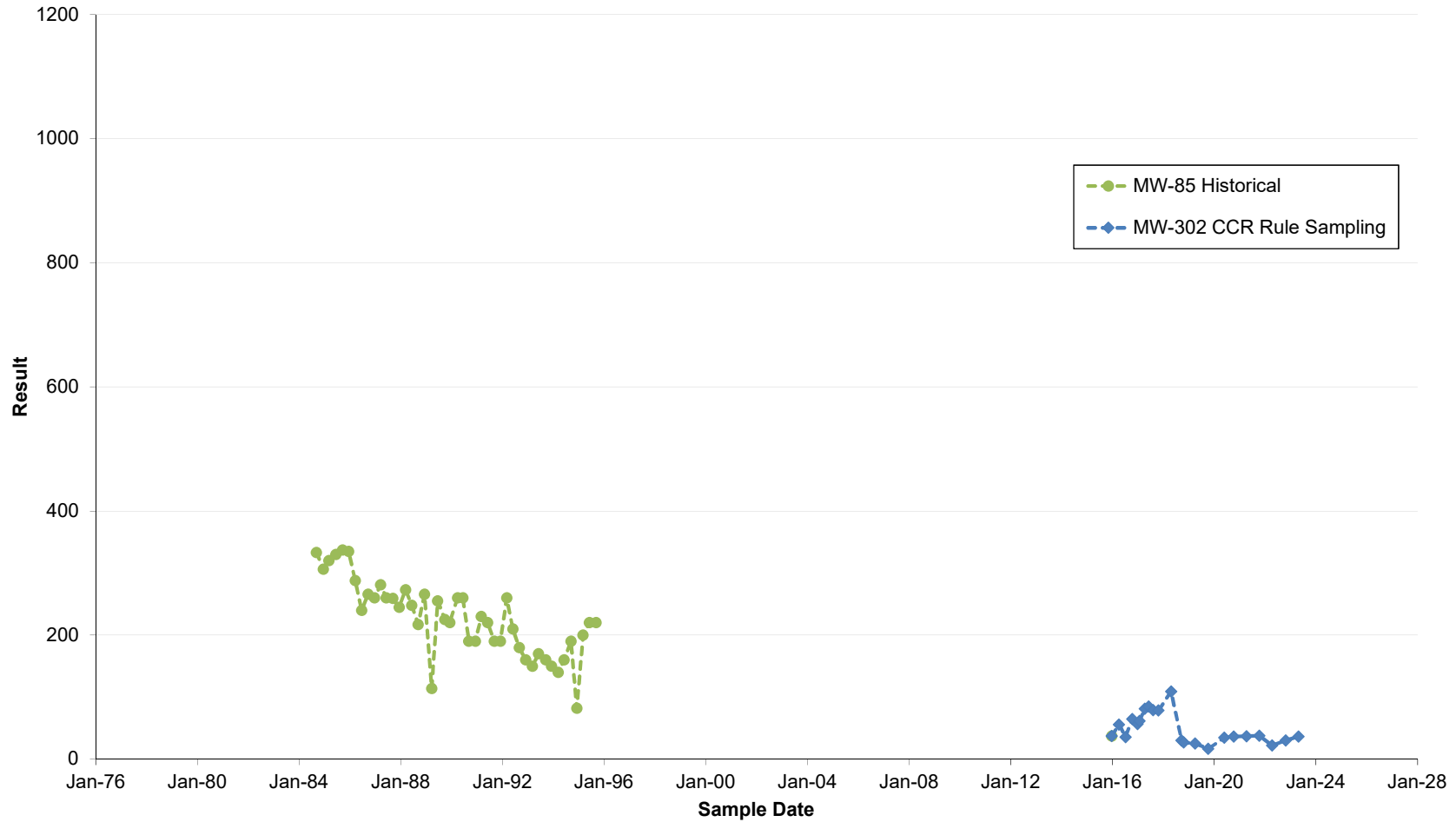
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[SO₄_COL Dry.xlsx]MW-33AR CCR


Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-34A - Sulfate (mg/l as SO4)



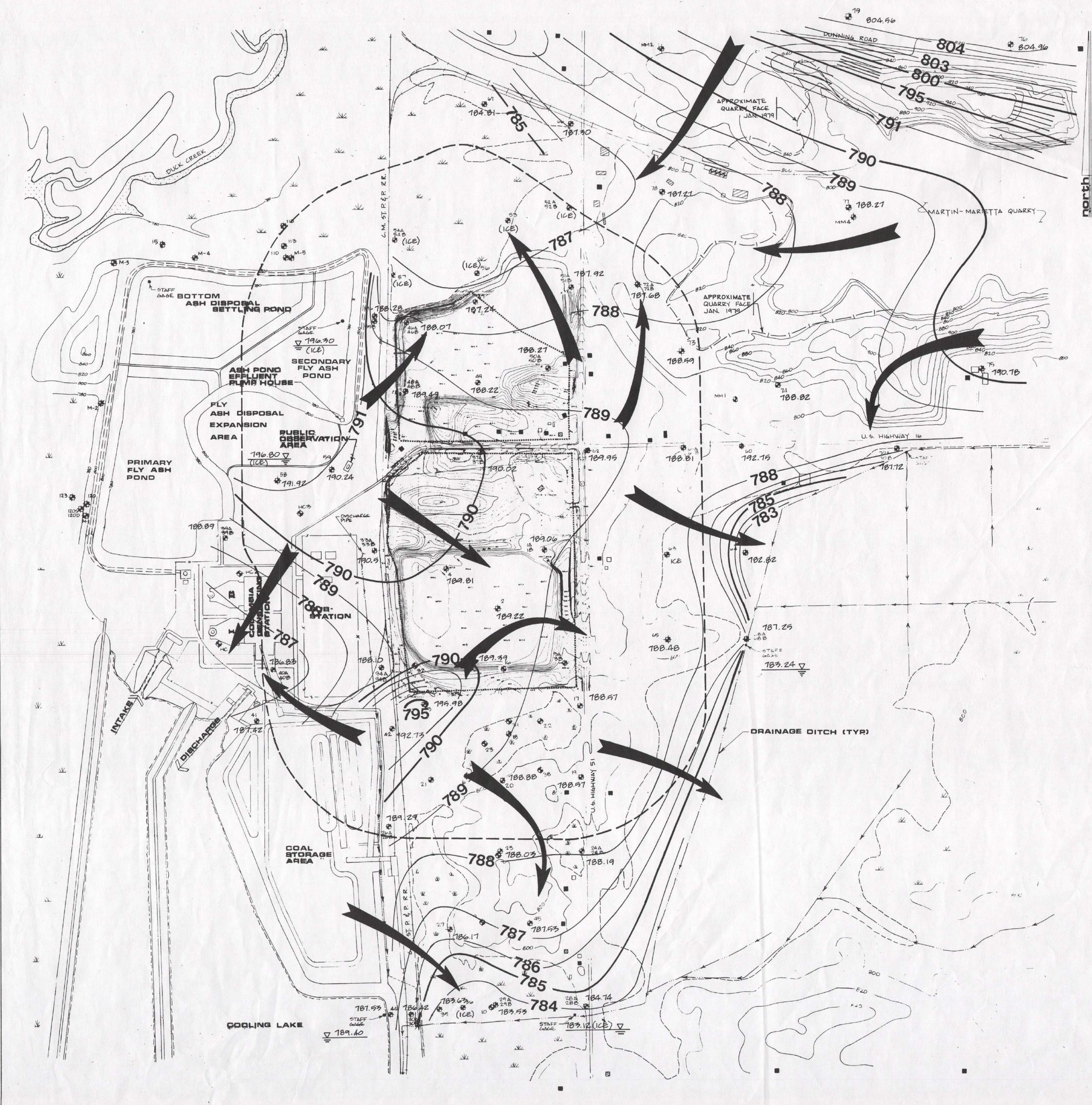
I:\25223067.00\Deliverables\COL 1-3 ASD - April 2023\Graphs\[SO4_COL Dry.xlsx]MW-34A CCR

Wisconsin Power & Light Company
Columbia Dry Ash Disposal Facility
MW-85 and MW-302 - Sulfate (mg/l as SO4)





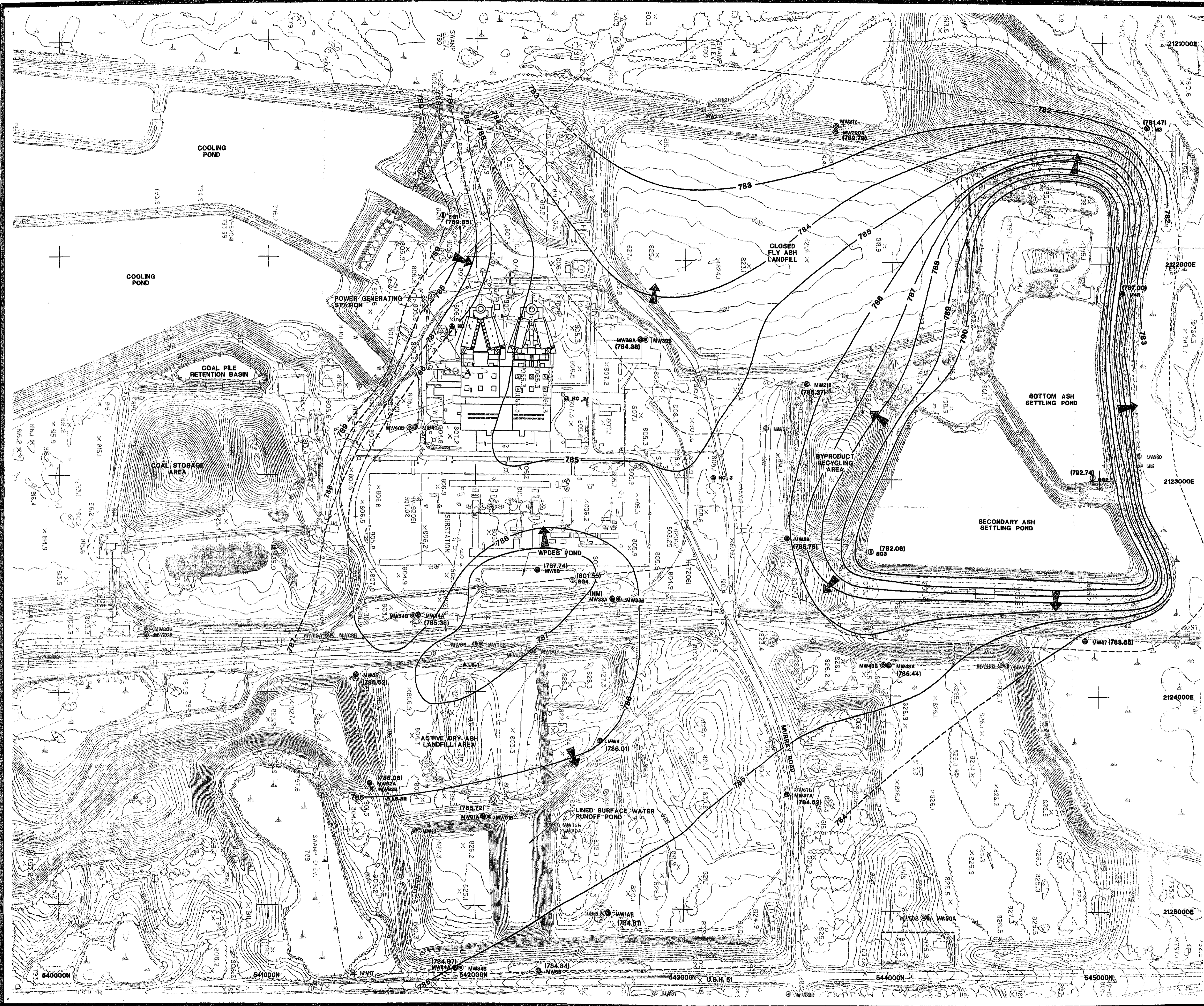
Appendix D
Historical Groundwater Flow Maps



LEGEND

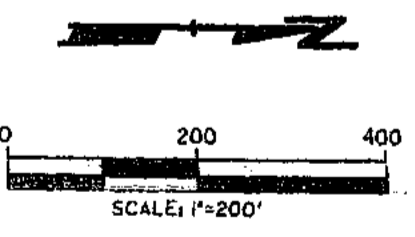
- PROPOSED PROJECT AREA
- ⊕ 720.29 OBSERVATION WELL LOCATION, NUMBER, AND WATER TABLE ELEVATION
- ⊕ BORING LOCATION AND NUMBER
- WETLANDS
- TOPOGRAPHIC CONTOURS (CONTOUR INTERVAL: 20FT.)
- PRIVATE RESIDENCES (ASSUMED LOCATIONS OF PRIVATE WATER SUPPLY WELLS)
- ▣ COMMERCIAL BUILDINGS (ASSUMED LOCATIONS OF POSSIBLE PUBLIC WATER SUPPLY WELLS)
- SURFACE WATERS (STREAMS OR DRAINAGE DITCHES); ARROWS INDICATE DIRECTION OF FLOW
- OTHER BUILDINGS (GARAGES, BARN, ETC.)
- ⊕ HIGH CAPACITY WELLS
- 790- WATER TABLE CONTOURS (CONTOUR INTERVAL: 1 FT.)
- ➔ DIRECTION OF GROUNDWATER FLOW

NO	BY	DATE	REVISION	APPD					
WATER TABLE CONTOUR MAP 2/4/81									
PLAN OF OPERATION - ASH DISPOSAL FACILITY									
COLUMBIA SITE									
WISCONSIN POWER & LIGHT COMPANY									
PART OF SECTIONS 27 & 34, T12N, R9E									
TOWN OF PACIFIC COLUMBIA CO. WISCONSIN									
WARZYN		DRAWN TDH	SCALE 1"=300'	SHEET 39 OF 39					
		CHECKED RJK	DATE 2/10/81	DRAWING NO.					
ENGINEERING INC.		APPROVED		C7134-94					
		REFERENCE		PRINTED 8/3/88					



- LEGEND**
- PROPERTY LINE
 - EXISTING RAILROAD TRACKS
 - EXISTING GROUND CONTOUR
 - CONTOUR DEPRESSION
 - EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EXISTING FENCE
 - EXISTING BUILDING
 - EXISTING SPOT ELEVATION
 - TRES AND/OR BRUSH
 - WETLAND AREA
 - EDGE OF WATER
 - HC 1 WATER SUPPLY WELL
 - MW61A WATER TABLE WELL
 - MW61B PIEZOMETER
 - ABANDONED WATER TABLE WELL
 - ABANDONED PIEZOMETER
 - 801 STAFF GAUGE
 - △ LB-1 LYSEMETER
 - DESIGN MANAGEMENT ZONE
 - PROPERTY LINE
 - O.S. OPEN STORAGE
 - O.H. OVERHEAD STRUCTURE
 - E.P.S. ELECTRICAL POWER STATION
 - T TANK
 - W WALL
 - (785.31) WATER TABLE ELEVATION (FT.-MSL)
(N.M. = NOT MEASURED)
 - 786 GROUNDWATER CONTOUR LINE
(FT. INTERVAL - FT. M.S.L.)
(DASHED WHERE INFERRED)
 - ➔ GROUNDWATER FLOW DIRECTION

- NOTES**
1. BASE MAP IS PROVIDED BY WISCONSIN POWER & LIGHT CO. AND IS BASED ON PHOTOS TAKEN ON APRIL 6, 1995 BY AERO-METRIC ENGINEERING, SHEBOYGAN, WI.
 2. HORIZONTAL DATUM IS BASED ON THE WISCONSIN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE. DATUM HAD 6560.
 3. VERTICAL DATUM IS REFERENCED TO U.S.G.S. MEAN SEA LEVEL (MSL). TOPOGRAPHIC CONTOUR INTERVAL IS TWO FEET.
 4. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER & LIGHT CO. IN DECEMBER 1994 & NOVEMBER 1996.
 5. THE LOCATION OF THE DESIGN MANAGEMENT ZONE DEMARCATION LINE IS APPROXIMATE.
 6. WATER ELEVATION USED TO PREPARE THIS MAP WERE MEASURED ON OCTOBER 24, 2002.
 7. THE WATER LEVEL AT MW 33A AND MW 33B COULD NOT BE MEASURED DURING OCTOBER 2002 DUE TO AN OBSTRUCTION IN THE WELL CASING.



3.			
2.			
1.			
NO.	BY	DATE	REVISION
PROJECT: ALLIANT ENERGY - WP&L COLUMBIA ASH PONDS & DRY ASH DISPOSAL FACILITY			
SHEET TITLE: WATER TABLE MAP (OCTOBER 2002)			
DRAWN BY: defoeJ	SCALE: 1"=200'	PROJ. NO. 3024.28	FILE NO. WATERTBL.PLT
CHECKED BY: JCR	DATE PRINTED:	FIGURE 3	
APPROVED BY: JCO	DATE PRINTED:	DATE: JANUARY 2003	
744 Highland Trail Madison, WI 53717-1934 P.O. Box 9923 Madison, WI 53708-6923 Phone: 608-831-4444			

PROJ. DATE: 10/24/02
 DRAWN BY: defoeJ
 CHECKED BY: JCR
 APPROVED BY: JCO
 DATE: 1/2/03
 SCALE: 1"=200'
 SHEET NO.: 3 OF 3
 PROJECT NO.: 3024.28
 FILE NO.: WATERTBL.PLT
 FIGURE NO.: 3
 DATE PRINTED: 1/2/03
 RMT

2023 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

25223067.00 | January 31, 2024

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

OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Modules 4, 5, and 6 2023 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	<u>October and November 2022</u> Boron: MW-309 Calcium: MW-309 Chloride: MW-310 <u>April and June 2023</u> Boron: MW-309 Sulfate: MW-309
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2022 and April 2023 events during 2023. 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

Table of Contents

Section	Page
Overview of Current Status	i
1.0 Introduction.....	1
2.0 Background.....	1
2.1 Geologic and Hydrogeologic Setting.....	1
2.1.1 Regional Information.....	1
2.1.2 Site Information	2
2.2 CCR Rule Monitoring System	2
3.0 § 257.90(e) Annual Report Requirements.....	2
3.1 § 257.90(e)(1) Site Map.....	3
3.2 § 257.90(e)(2) Monitoring System Changes.....	3
3.3 § 257.90(e)(3) Summary of Sampling Events.....	3
3.4 § 257.90(e)(4) Monitoring Transition Narrative.....	4
3.5 § 257.90(e)(5) Other Requirements.....	4
3.5.1 § 257.90(e) General Requirements.....	5
3.5.2 § 257.94(d) Alternative Detection Monitoring Frequency.....	5
3.5.3 § 257.94(e)(2) Alternative Source Demonstration for Detection Monitoring	6
3.5.4 § 257.95(c) Alternative Assessment Monitoring Frequency.....	6
3.5.5 § 257.95(d)(3) Assessment Monitoring Results and Standards	6
3.5.6 § 257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring .	6
3.5.7 § 257.96(a) Extension of Time for Corrective Measures Assessment	6
3.6 §257.90(e)(6) Overview.....	7
4.0 References.....	7

Tables

Table 1.	Groundwater Monitoring Well Network
Table 2.	Groundwater Samples Summary
Table 3.	Groundwater Elevation - State Monitoring Program and CCR Well Network
Table 4.	Horizontal Gradients and Flow Velocity
Table 5.	Groundwater Analytical Results Summary
Table 6.	Groundwater Field Data Summary

Figures

Figure 1.	Site Location Map
Figure 2.	Site Plan and Monitoring Well Locations
Figure 3.	Water Table Map - April 2023
Figure 4.	Water Table Map - October 2023

Appendices

Appendix A	Summary of Regional Hydrogeologic Stratigraphy
Appendix B	Boring Logs and Well Construction Documentation
Appendix C	Laboratory Reports
Appendix D	Historical Monitoring Results
Appendix E	Alternative Source Demonstrations
	E1 October 2022 Detection Monitoring
	E2 April 2023 Detection Monitoring

I:\25223067.00\Deliverables\2023 - Fed CCR Annual Report - COL Mod 4-6\240131_2023 Annual CCR GW Report COL MOD 4-6 LF_Final.docx

1.0 INTRODUCTION

This 2023 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 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

This report covers the period of groundwater monitoring from January 1, 2023, through December 31, 2023.

The Columbia Energy Center (COL) Dry Disposal Ash Facility is an active CCR landfill and includes an existing CCR unit and two 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 and new CCR unit COL Mod 10-11. 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 and Modules 10-11 of the COL Dry Ash Disposal Facility.

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 2023 water levels and apparent flow directions reflect the influence of a temporary dewatering system installed to lower groundwater levels in the area of the Primary Pond as part of the closure project for that CCR Unit. The water table elevations and groundwater flow directions for the April 2023 monitoring event are shown on **Figure 3**, and the water table elevations and groundwater flow directions for the October 2023 monitoring event are shown on **Figure 4**. 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 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 2023.

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 2023 at COL Dry Ash Disposal Modules 4-6 as part of ongoing detection monitoring. Samples collected in June and November 2023 were collected for limited parameters at select wells during retest events for the April and October 2023 sampling events, respectively.

Groundwater samples collected during the semiannual events, in April and October 2023, were analyzed for the Appendix III constituents. The retest sampling events in June and November 2023 were limited to a subset of the Appendix III constituent list. The June retesting was performed for select parameters that exceeded the upper prediction limits (UPLs) in the April sampling event. The November retesting was performed for select parameters that exceeded the UPLs 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 2022 monitoring event data was completed and transmitted to WPL on January 26, 2023. The validation and evaluation of the April and June 2023 monitoring event data was completed and transmitted to WPL on August 24, 2023. The validation and evaluation of the October 2023 monitoring event and November 2023 retest sampling event data was in progress at the end of 2023 and will be transmitted to WPL in 2024; therefore, the October and November 2023 monitoring results and analytical report will be included in the 2024 annual report. The October and November 2023 groundwater elevation data is included in this report.

The sampling results for Appendix III parameters in October 2022 are summarized in **Table 5A**. The sampling results for Appendix III parameters in April 2023 are summarized in **Table 5B**. Field parameter results for the October 2022, November 2022, April 2023, and June 2023 sampling events are provided in **Table 6**. The analytical laboratory reports for October 2022, November 2022, April 2023, and June 2023 are provided in **Appendix C**. Historical results for each monitoring well through April 2023 are summarized in **Appendix D**.

The October 2022 analyses for the samples collected from background wells MW-84 and MW-301 are provided in two laboratory reports: an initial report and a reanalysis report. The reanalysis only affects Appendix IV parameters, which are not required for the Mod 4-6 LF CCR Unit, but are required for other CCR Units at COL. The background well samples were reanalyzed for select metals because the original results were flagged for detections in the method blank sample and/or were not consistent with historical results. The reanalysis was completed within the method holding time, the metals were not detected in the method blank, and no other flags were applied to the results. Based on the quality control review, the reanalysis results were considered to be more accurate than the original analyses.

The November 2022 retesting for select parameters was performed in conjunction with additional sampling performed for the State monitoring program; therefore, the laboratory report for the retesting includes additional wells and parameters that are not relevant to the Federal CCR Rule sampling. Only the retest results performed for the CCR Rule sampling are included in **Table 5**.

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 2023. The COL Dry Ash Disposal Facility, Mod 4-6 remained in the detection monitoring program.

In 2023, the monitoring results for the October 2022 and April 2023 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 intrawell UPLs 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.

For the October 2022 event, SSIs for boron, calcium, and chloride were identified. For the April 2023 event, SSIs for boron and sulfate were identified.

Alternative source demonstrations (ASDs) were completed for the October 2022 and April 2023 events, demonstrating that sources other than the CCR unit were the likely cause of the observed concentrations of boron, calcium, chloride, and 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 2023 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 2023.

Summary of Key Actions Completed.

- Statistical evaluation and determination of SSIs for the October 2022 and April 2023 monitoring events.
- ASD reports for the SSIs identified from the October 2022 and April 2023 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2023).
- Two resampling events at MW-309 in June and November 2023.

Description of Any Problems Encountered. No problems were encountered for Mod 4-6 in 2023.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2024).

- Statistical evaluation and determination of any SSIs for the October 2023 and April 2024 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 2024).

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 2022 and April 2023 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.

[This page left blank intentionally]

Tables

- 1 Groundwater Monitoring Network
- 2 Groundwater Samples Summary
- 3 Groundwater Elevation – State Monitoring Program
and CCR Well Network
- 4 Horizontal Gradients and Flow Velocity
- 5 Groundwater Analytical Results Summary
- 6 Groundwater Field Data Summary

**Table 1. Groundwater Monitoring Well Network
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25223067.00**

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

Created by: NLB
 Last revision by: NLB
 Checked by: BR

Date: 11/29/2023
 Date: 11/29/2023
 Date: 12/4/2023

Table 2. Groundwater Samples Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25223067.00

Sample Dates	Downgradient Wells			Background Wells	
	MW-309	MW-310	MW-311	MW-84A	MW-301
April 26-27, 2023	D	D	D	D	D
June 29, 2023	D-R	--	--	--	--
October 9-11, 2023	D	D	D	D	D
November 9, 2023	D-R	--	--	--	--
Total Samples	4	2	2	2	2

Abbreviations:

D = Detection Monitoring

D-R = Detection Monitoring Retest Sample

-- = Not Sampled

Created by: NLB

Date: 12/4/2023

Last revision by: NLB

Date: 12/4/2023

Checked by: BR

Date: 12/4/2023

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

	Well Number	MW-1AR	MW-4	MW-5R	MW-33AR	MW-33BR	MW-34A	MW-34B	MW-37A	MW-83	MW-84A	MW-84B	MW-86	MW-91AR	MW-91B	MW-92A	MW-92B	MW-93A	MW-93B	MW-312
	Top of Casing Elevation (feet amsl)	822.55	819.74	805.44	808.29	808.39	805.95	806.05	813.04	807.96	814.28	814.26	824.79	809.03	808.45	808.47	808.41	827.89	827.71	826.79
	Screen Length (ft)																	10	5	10
	Total Depth (ft from top of casing)	44.40	39.58	25.97	31.08	57.50	35.43	56.95	31.80	25.42	40.21	52.02	45.43	32.90	52.38	28.94	51.75	50.7	82.5	52.5
	Top of Well Screen Elevation (ft)	778.15	780.16	779.47	777.21	750.89	770.52	749.10	781.24	782.54	774.07	762.24	779.36	776.13	756.07	779.53	756.66	787.19	750.21	784.29
	Measurement Date																			
	October 2, 2012	783.41	783.70	784.96	782.38	782.23	783.03	782.99	782.66	dry	783.84	783.94	783.81	784.09	783.90	784.49	784.06	NI	NI	NI
	April 15, 2013	785.44	784.02	786.09	784.16	784.14	784.74	784.79	783.87	784.49	785.83	785.76	785.22	785.14	785.01	785.75	785.34	NI	NI	NI
	October 8, 2013													785.66	785.42	785.97	785.52	NI	NI	NI
	October 15, 2013	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.66	785.42	785.97	785.52	NI	NI	NI
	April 14, 2014	784.95	784.09	785.63	783.74	783.91	784.63	784.70	783.45	783.73	785.58	785.52	784.96	785.04	784.96	785.99	785.54	NI	NI	NI
	October 2-3, 2014	785.03	785.39	786.08	784.37	784.28	784.57	784.54	784.56	dry	785.24	785.18	785.19	785.47	785.28	785.75	785.33	NI	NI	NI
	April 13-14, 2015	783.96	783.63	785.25	783.01	782.74	783.65	783.95	782.87	dry	784.43	784.51	784.17	784.48	784.37	785.07	784.66	NI	NI	NI
	October 6-7, 2015	784.28	784.44	785.72	783.68	783.33	784.05	784.02	783.66	dry	784.80	784.76	784.66	784.89	784.70	785.20	784.76	NI	NI	NI
	April 4-6, 2016	785.82	aband	787.02	785.29	785.07	785.63	785.67	784.76	785.43	786.37	786.26	785.89	786.05	785.95	786.61	786.21	NI	NI	NI
	October 11-13, 2016	786.64	aband	788.00	787.36	786.46	786.45	786.32	786.40	786.81	787.22	787.11	786.96	787.17	786.81	787.68	787.25	NI	NI	NI
	April 10-13, 2017	786.96	aband	788.13	786.39	785.99	786.30	786.28	786.34	786.23	787.16	787.06	786.96	787.24	787.03	787.90	787.60	NI	NI	NI
	October 3-5, 2017	785.48	aband	786.66	784.51	784.22	784.67	784.63	784.86	784.29	NM	786.49	785.58	786.08	785.83	786.47	786.02	NI	NI	NI
	October 9-10, 2017	NM	aband	NM	NM	NM	NM	NM	NM	NM	785.56 ⁽⁶⁾	NM	NM	NM	NM	NM	NM	NI	NI	NI
	February 21, 2018	783.97	aband	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	784.68	784.46	NM	NM	NI	NI	NI
	April 23-25, 2018	783.99	aband	785.36	783.09	786.36	781.77	780.79	783.28	783.32	785.88	784.91	782.54	784.71	784.53	785.23	784.81	NI	NI	NI
	October 23-25, 2018	788.25	aband	789.71	788.77	787.96	787.88	787.73	787.62	788.26	788.32	788.19	788.21	788.59	788.31	789.32	788.87	NI	NI	NI
	April 1-4, 2019	787.05	aband	788.64	786.63	786.54	786.82	786.92	786.47	786.78	787.35	787.34	787.16	787.45	787.18	788.04	787.63	NI	NI	NI
	October 7-9, 2019	787.26	aband	789.23	788.26	787.64	787.92	787.74	786.77	788.90	787.79	787.73	787.44	787.78	787.62	788.63	788.17	NI	NI	NI
	May 27-28, 2020	786.92	aband	788.34	786.01	785.75	785.98	785.99	786.22	786.03	787.02	786.99	786.94	787.26	787.05	787.86	787.47	NI	NI	NI
	October 7-8, 2020	785.95	aband	787.76	785.91	785.45	785.70	785.68	785.52	785.72	786.10	786.06	786.10	786.55	786.33	786.85	786.38	NI	NI	NI
	February 25, 2021	NM	aband	NM	NM	NM	784.75	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI
	April 14, 2021	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	786.57	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

Dry Ash
Facility
(Facility ID
#03025)

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR
	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
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
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

Ash Pond
Facility
(Facility ID
#02325)

**Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6
SCS Engineers Project #25223067.00
January - December 2023**

Flow Path A - North					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	$\Delta h/\Delta l$ (ft/ft)	V (ft/d)
4/24-27/2023	786.00	785.05	929	0.0010	0.002

Flow Path A - Northwest					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	$\Delta h/\Delta l$ (ft/ft)	V (ft/d)
10/9-11/2023	784.00	782.58	1235	0.0011	0.002

Wells	K Values (cm/sec)	K Values (ft/d)	Assumed Porosity, n
MW-309	2.12E-04	0.60	
MW-310	1.91E-04	0.54	0.40
MW-311	6.12E-04	1.73	
Geometric Mean	2.92E-04	0.83	

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

ft = feet

ft/d = feet per day

K = hydraulic conductivity

n = effective porosity

V = groundwater flow velocity

h1, h2 = point interpreted groundwater elevation at locations 1 and 2

Δl = distance between location 1 and 2

$\Delta h/\Delta l$ = hydraulic gradient

Notes:

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

Created by: NDK
Last revision by: RM
Checked by: NLB

Date: 8/2/2022
Date: 1/2/2024
Date: 1/2/2024

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

Parameter Name	Background Wells				Compliance Wells											
	MW-84A		MW-301		MW-309				MW-310			MW-311				
	10/27/2022	4/27/2023	10/27/2022	4/27/2023	Intrawell UPL	10/26/2022	11/30/2022	4/26/2023	6/29/2023	Intrawell UPL	10/26/2022	11/30/2022	4/26/2023	Intrawell UPL	10/27/2022	4/26/2023
Groundwater Elevation (ft above msl)	784.57	786.97	784.91	787.57		781.50	781.62	785.05	784.12		780.96	781.14	785.18		781.23	785.69
Appendix III																
Boron, µg/L	12.2	10.3	37.5	20.1	42.2	46.6	49.3	50.8	59.4	81.9	71.3	--	57.5	49.8	34.2	23.0
Calcium, µg/L	78,400	68,600	628,000 P6	120,000	99,900	162,000	153,000	35,500	--	56,000	68,900	55,500	36,800	84,200	66,300	52,800
Chloride, mg/L	3.4	3.0	2.3	1.5 J	901	796	--	372	--	205	323	215	128	4.41	1.2 J	2.1
Fluoride, mg/L	<0.095	<0.095	<0.095	<0.095	DQ	<0.095	--	<0.095	--	DQ	<0.095	--	<0.095	DQ	<0.095	<0.095
Field pH, Std. Units	7.31	7.01	6.80	6.65	8.18	7.23	--	7.61	7.72	8.12	7.61	--	7.27	8.07	7.50	7.48
Sulfate, mg/L	1.1 J	1.3 J	11.6	12.3	53.1	28.9	--	143	147	118	32.8	--	102	131	15.5	22.2
Total Dissolved Solids, mg/L	302	326	282	526	1,730	1,670	--	1,250	--	759	750	--	654	462	268	292

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

Abbreviations:

mg/L = milligrams per liter
µg/L = micrograms per liter

SSI = Statistically Significant Increase
LOD = Limit of Detection

DQ= Double Quantification
LOQ = Limit of Quantitation

Lab Notes:

J = Estimated concentration at or above the LOD and below the LOQ.
P6 = Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

Note:

- Intrawell UPLs based on 1-of-2 retesting approach; therefore, there is no SSI unless the original sample result and a retest result are above the UPL.
- Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.

Created by: NDK	Date: 9/19/2022
Last revision by: BR	Date: 8/4/2023
Checked by: RM	Date: 12/12/2023
Scientist/PM QA/QC: TK	Date: 1/1/2024

I:\25223067.00\Deliverables\2023 - Fed CCR Annual Report - COL Mod 4-6\Tables\Table 5 - MOD 4-6LF Annual Analytical Results Summary.xlsx|Table 5 - Analytical

Table 6. Groundwater Field Data Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 4-6 / SCS Engineers Project #25223067.00

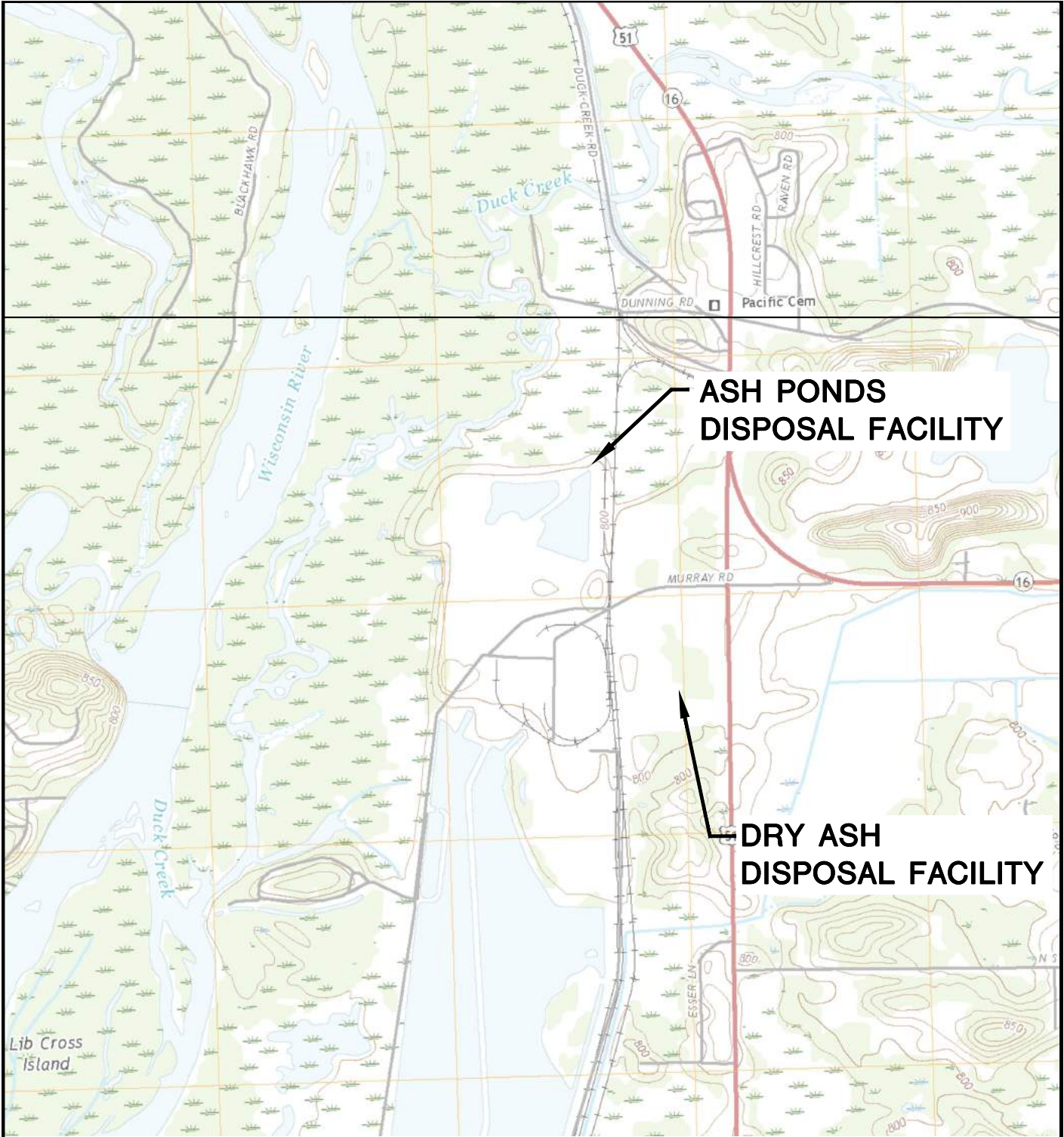
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-84A	10/27/2022	784.57	11.7	7.31	8.31	585	40	0.00
	4/27/2023	786.97	10.7	7.01	9.37	557	103	0.72
MW-301	10/27/2022	784.91	10.8	6.80	0.10	508	81	0.00
	4/27/2023	787.57	8.0	6.65	6.50	857	95	0.00
MW-309	10/26/2022	781.50	12.9	7.23	8.49	2591	41	1.81
	11/30/2023	781.62	7.7	7.30	8.97	2746	156	0.31
	4/26/2023	785.05	10.8	7.61	10.96	2073	107	1.90
	6/29/2023	784.12	13.9	7.72	9.22	3282	217	0.00
MW-310	10/26/2022	780.96	13.0	7.61	8.66	1404	31	1.58
	11/30/2023	781.14	10.8	7.67	9.46	1200	147	0.51
	4/26/2023	785.18	10.8	7.27	11.38	1040	113	2.25
MW-311	10/27/2022	781.23	11.9	7.50	8.92	487	35	0.00
	4/26/2023	785.69	9.8	7.48	10.58	485	118	0.39

Created by: DK
 Last revision by: NLB
 Checked by: BLR

Date: 9/2/2022
 Date: 8/1/2023
 Date: 8/2/2023

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map - April 2023
- 4 Water Table Map - October 2023



**ASH PONDS
DISPOSAL FACILITY**

**DRY ASH
DISPOSAL FACILITY**

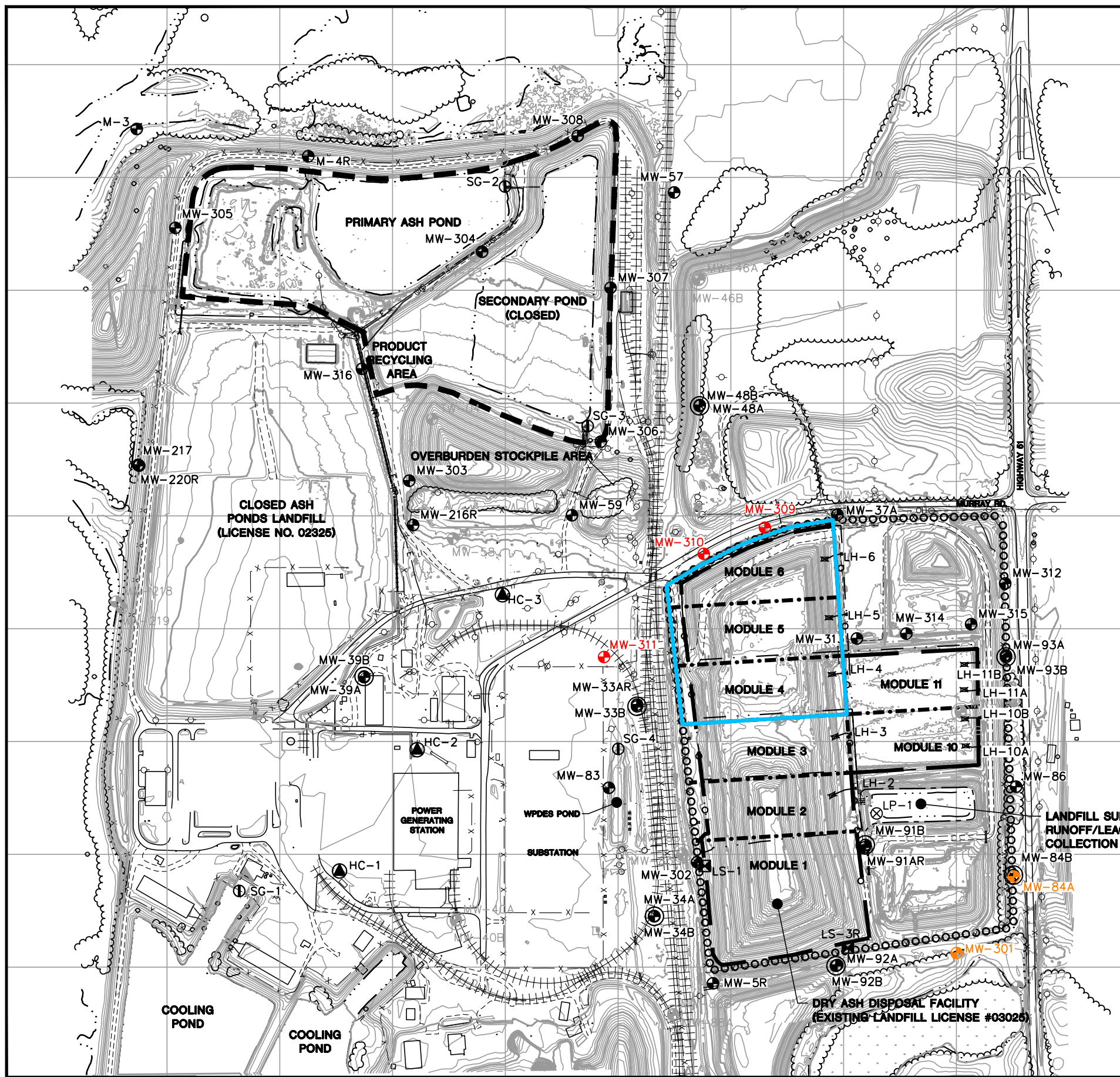


POYNETTE QUADRANGLE
WISCONSIN-COLUMBIA CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
2018
SCALE: 1" = 2,000'



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

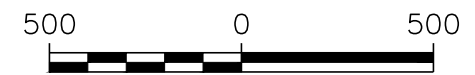
I:\25219067.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:38:21 PM



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.



SCALE: 1" = 500'

PROJECT NO.	25223067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	01/09/2024	APPROVED BY:	TK 1/10/2024

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

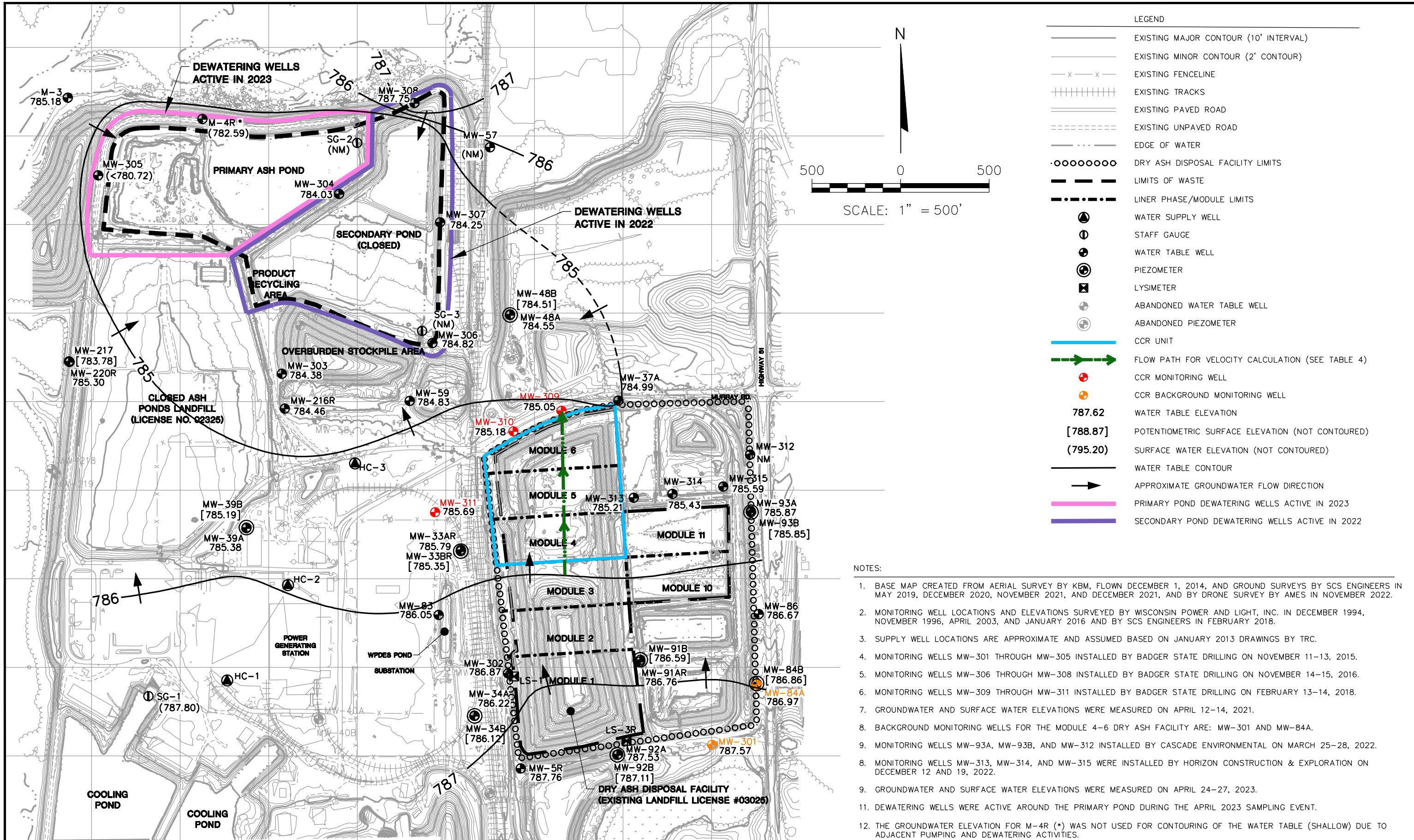
CLIENT
 ALLIANT ENERGY
 COLUMBIA ENERGY CENTER
 W8375 MURRAY ROAD
 PARDEEVILLE, WI 53954

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

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE
 2

I:\25223067.00\Drawings\Module 4\Site Plan and Monitoring Well Locations.dwg, 1/9/2024 10:38:34 AM

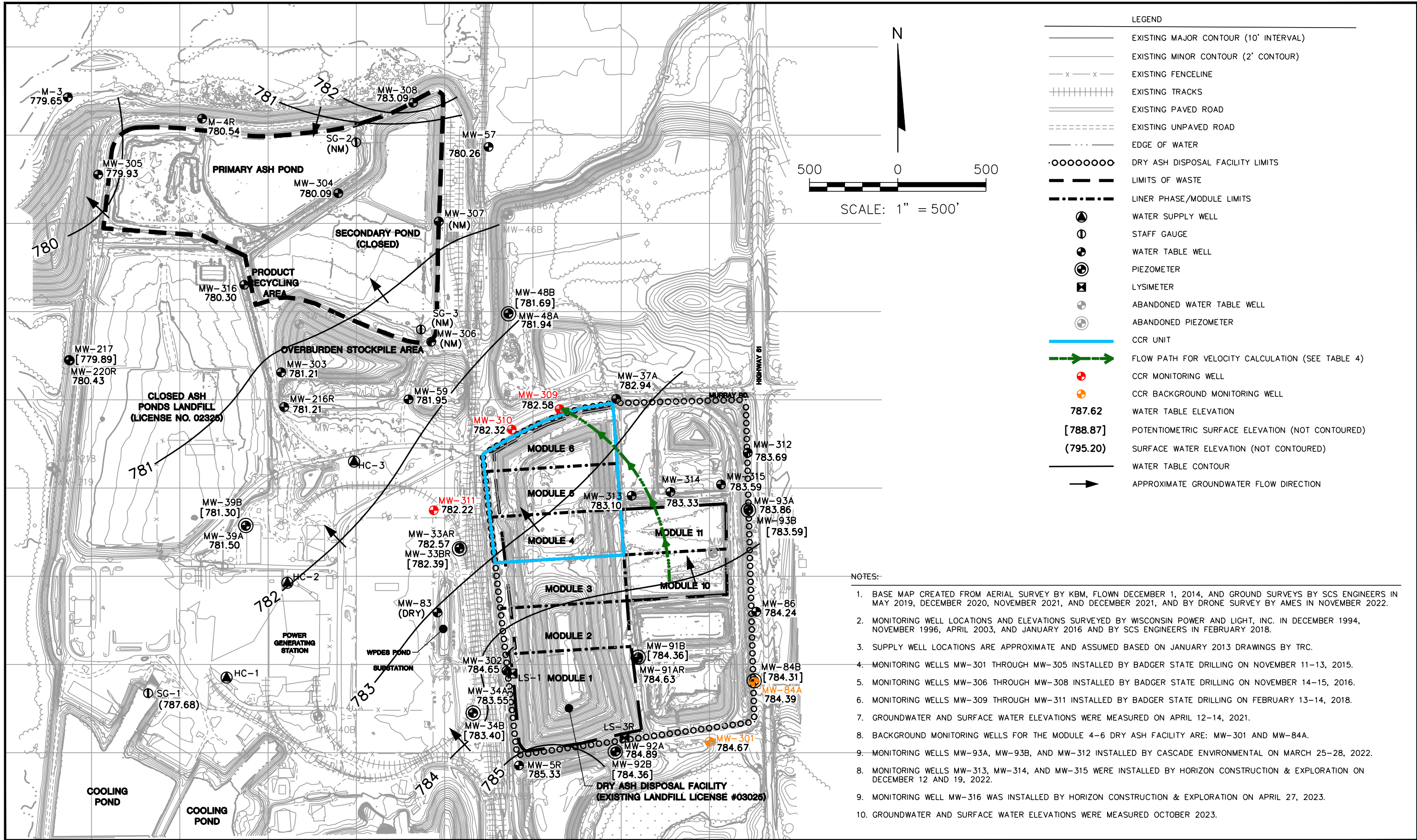


LEGEND	
	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
	DRY ASH DISPOSAL FACILITY LIMITS
	LIMITS OF WASTE
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE 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
	WATER TABLE ELEVATION
	POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
	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	 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	FIGURE	3
DRAWN: 10/12/2023	CHECKED BY: NLB		ENGINEER					
REVISED: 01/22/2024	APPROVED BY: TK 1/29/2024							

I:\25223067.00\Drawings\Module 4\Water Table Map-April 2023.dwg, 1/22/2024 9:41:17 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
	WATER TABLE ELEVATION
	POTENTIOMETRIC SURFACE ELEVATION (NOT CONTOURED)
	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 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. MONITORING WELL MW-316 WAS INSTALLED BY HORIZON CONSTRUCTION & EXPLORATION ON APRIL 27, 2023.
 10. GROUNDWATER AND SURFACE WATER ELEVATIONS WERE MEASURED OCTOBER 2023.

PROJECT NO.	25223067.00	DRAWN BY:	KP	 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 OCTOBER 2023	FIGURE 4
DRAWN:	11/13/2023	CHECKED BY:	NLB					
REVISED:	01/09/2024	APPROVED BY:	TK 1/10/2024					

I:\25223067.00\Drawings\Module 4\Water Table Map-October 2023.dwg, 1/9/2024 10:43:27 AM



Appendix A

Summary of Regional Hydrogeologic Stratigraphy

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

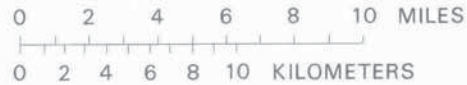
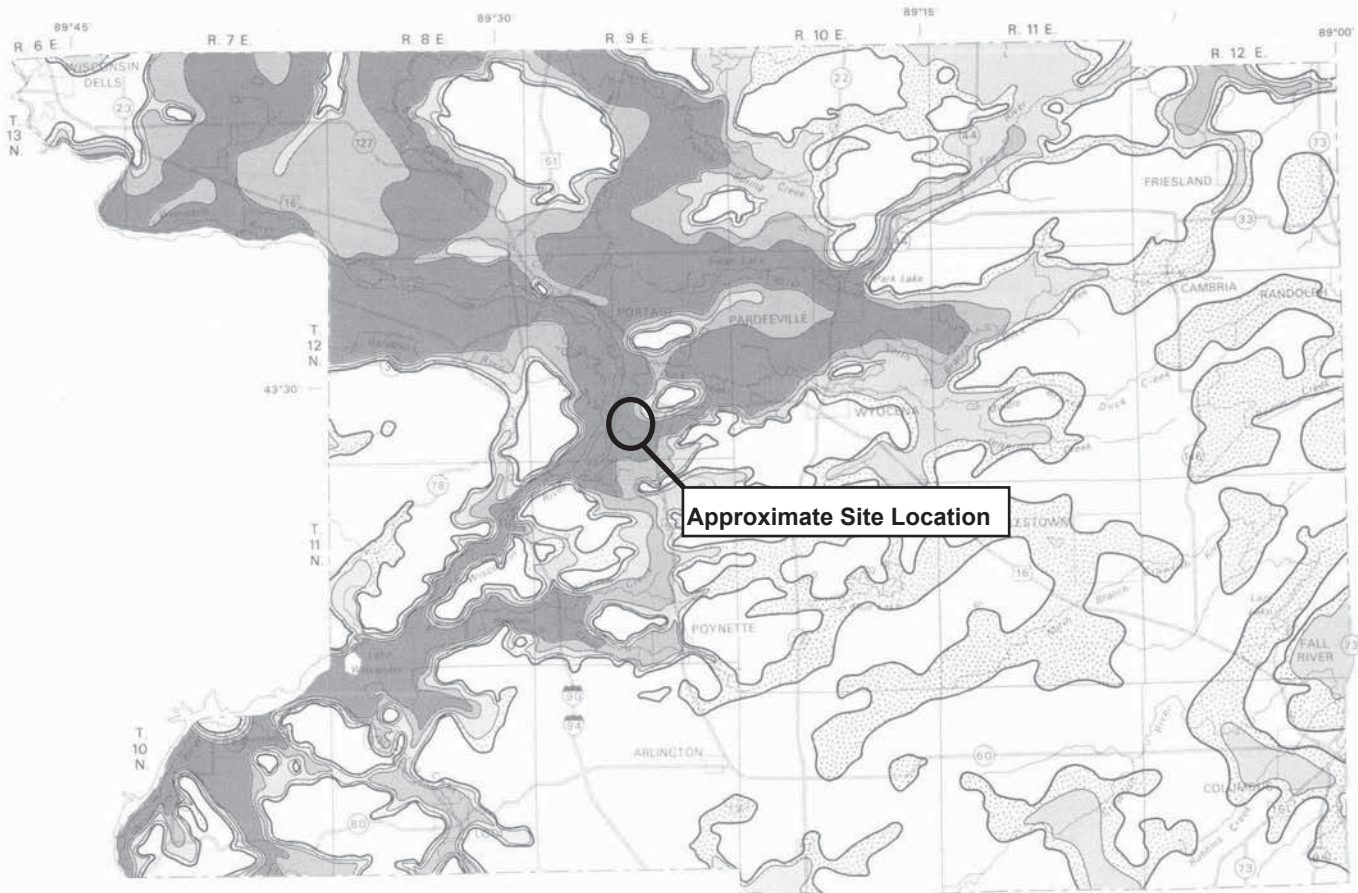
Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	<ul style="list-style-type: none"> Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	<ul style="list-style-type: none"> Dolomite and shaley dolomite Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	<ul style="list-style-type: none"> 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



EXPLANATION

Probable well yields

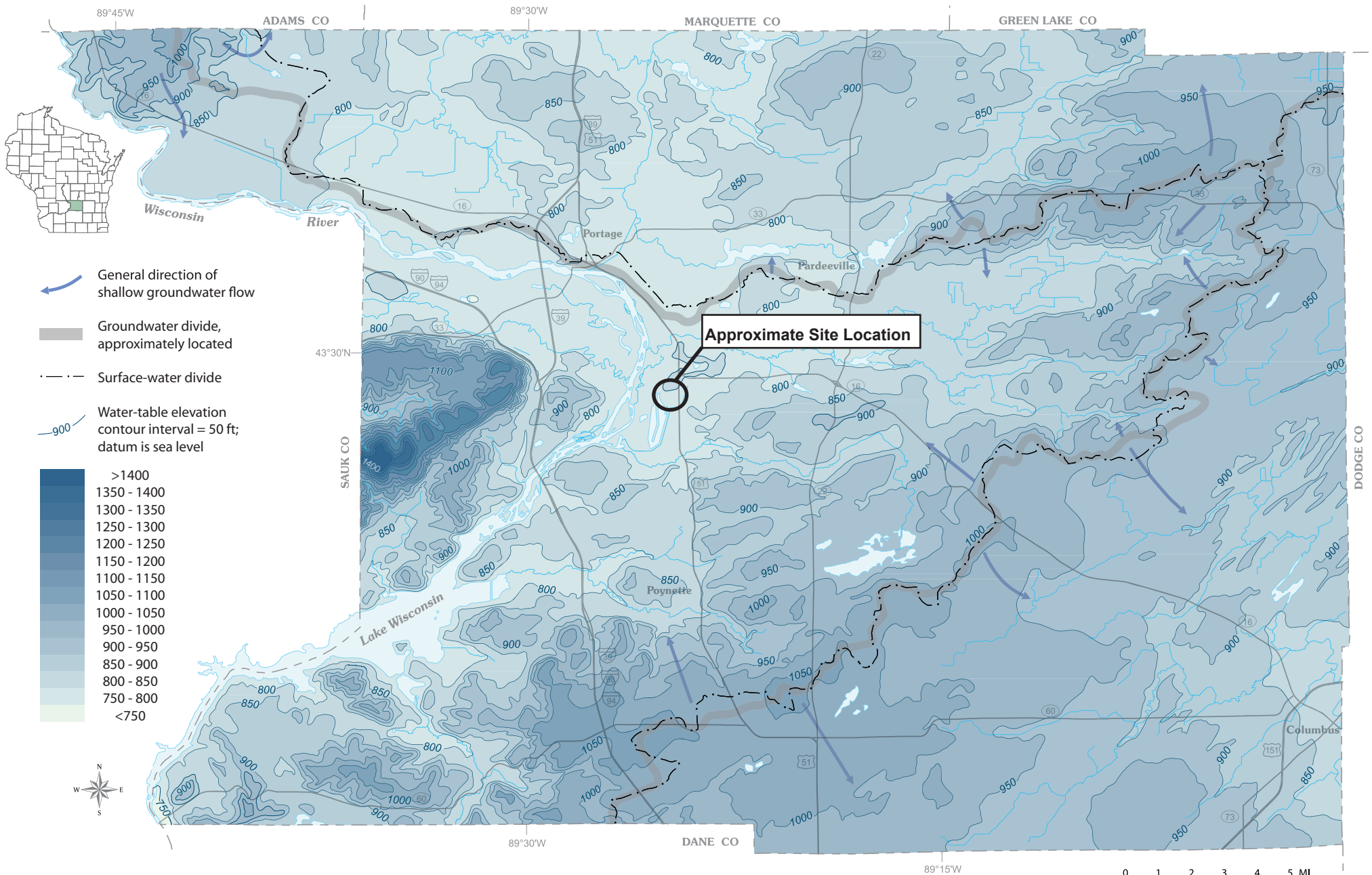
-  Chances of more than 100 gallons per minute are poor
-  Chances of 100-500 gallons per minute are good
-  Chances of 500-1000 gallons per minute are good
-  Chances of more than 1000 gallons per minute are good

Boundary of saturated sand-and-gravel aquifer

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 Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.
 02/26/2024 - Classification: Internal - ECRM13238614

Generalized water-table elevation in 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 8536, MADISON, WIS. 53715 • TEL. (608) 257-4848

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

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling _____

Upon Completion of Drilling _____

Time After Drilling _____

Depth to Water _____

Depth to Cave In _____

10/5/83 10/5/83

Start _____ Complete _____

Crew Chief JVS Rig B-40

Drilling Method ED 0-37'

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

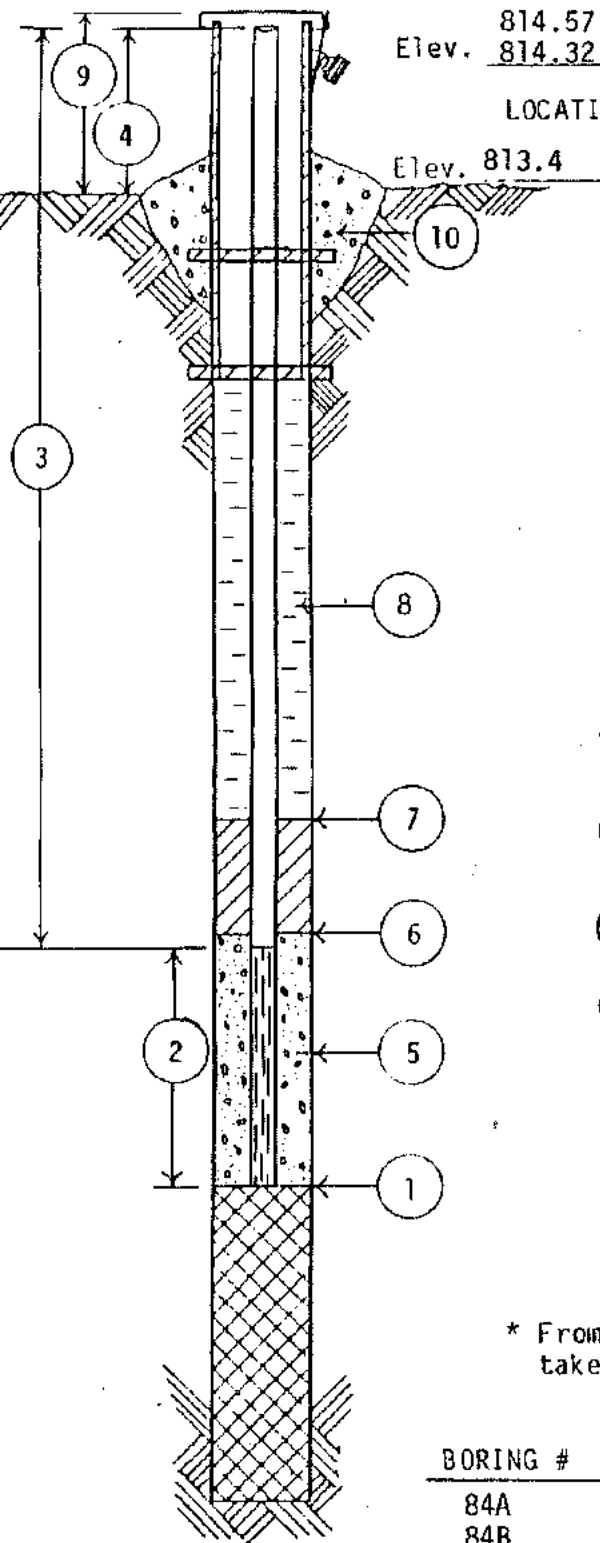
BORING NO. MW-84A

DATE 10/5/83

Elev. 814.57 Steel
Elev. 814.32 PVC CHIEF JS

LOCATION WP&L-Columbia Generating Station

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"	



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

Facility/Project Name WPL-Columbia		SCS#: 25215135.00		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State Drilling				Date Drilling Started 11/11/2015		Date Drilling Completed 11/11/2015	
WI Unique Well No. VY701		DNR Well ID No.		Common Well Name		Final Static Water Level Feet	
						Surface Elevation 803.69 Feet	
						Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>				Local Grid Location			
State Plane 541562.2 N, 2025001.0 E S/C/N				Lat _____ " <input type="checkbox"/> N <input type="checkbox"/> E			
1/4 of _____ 1/4 of Section 27 , T 12 N, R 9 E				Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W			
Facility ID		County Columbia		County Code 11		Civil Town/City/ or Village Portage	

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

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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-301**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

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

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

Facility/Project Name WPL - Alliant Columbia Generating Station SCS#: 25217156.01		License/Permit/Monitoring Number		Boring Number MW-309	
Boring Drilled By: Name of crew chief (first, last) and Firm Mark Crampton Badger State Drilling, Co.		Date Drilling Started 2/13/2018		Date Drilling Completed 2/14/2018	
Drilling Method hollow stem auger		WI Unique Well No. VR111		DNR Well ID No.	
Common Well Name MW-309		Final Static Water Level 26.7 Feet MSL		Surface Elevation 809.88 Feet MSL	
Borehole Diameter 8.5 in.		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>		Local Grid Location	
State Plane 543,448 N, 2,124,151 E S/C/N		Lat _____ "		Fect <input type="checkbox"/> N	
NW 1/4 of SE 1/4 of Section 27, T 12 N, R 9 E		Long _____ "		Fect <input type="checkbox"/> S	
Facility ID		County Columbia		County Code 11	
				Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Hydrovaced boring to 8.5 below ground surface; open hole.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
S1	20	11 14 18	9	POORLY GRADED SAND, fine to coarse, yellow, (10YR 7/6), rounded grains.					N/A	M				
S2	20	12 15 20 28	12	Same but with trace gravel.	SP				N/A	M				
S3	24	16 20 26	14	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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number		MW-309				Use only as an attachment to Form 4400-122.				Page 2 of 2				
Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	22	11 17 32 41	16 17	POORLY GRADED SAND, fine to coarse, yellow, (10YR 7/6), rounded grains, trace silt.					N/A	M				
S5		22 29 36	18 19 20						N/A	M				
S6	24	18 20 28 36	21 22						N/A	M				
S7		18 24 32	23 24 25						N/A	M				
S8	22	14 18 30 40	26 27			SP			N/A	W			Depth to water at ~ 26 feet.	
S9	22	22 32 34	28 29 30						N/A	W				
			31 32 33 34 35 36											
					End of Boring at 36.5 feet bgs.									

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

Facility/Project Name WPL - Alliant Columbia Generating Station SCS#: 25217156.01		License/Permit/Monitoring Number		Boring Number MW-310	
Boring Drilled By: Name of crew chief (first, last) and Firm Dave Cruise Badger State Drilling, Co.		Date Drilling Started 2/13/2018		Date Drilling Completed 2/13/2018	
Drilling Method hollow stem auger		WI Unique Well No. VR110		DNR Well ID No.	
Common Well Name MW-310		Final Static Water Level 27.9 Feet MSL		Surface Elevation 810.96 Feet MSL	
Borehole Diameter 8.5 in.		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>		Local Grid Location	
State Plane 543,332 N, 2,123,880 E S/C/N		Lat _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
NW 1/4 of SE 1/4 of Section 27, T 12 N, R 9 E		Long _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Columbia		County Code 11	
		Civil Town/City/ or Village Town of Pacific			

Sample Number and Type	Length Int. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Hydrovaced boring to 8 feet below ground surface; open hole.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
S1	18	46 88	9	POORLY GRADED SAND AND GRAVEL, fine to medium sand, coarse gravel, brownish yellow, (10YR 6/6), angular gravel, round sand.					N/A	M				
			10											
			11	Same as above but trace gravel.										
S2	24	1827 3840	12		SP				N/A	M				
			13											
			14											
S3	24	2632 4038	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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-310** Use only as an attachment to Form 4400-122. Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments			
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200				
S4	10	25 50/5	16-17	POORLY GRADED SAND AND GRAVEL, fine to medium sand, coarse gravel, brownish yellow, (10YR 6/6), angular gravel, round sand.	SP			N/A	M				Tough drilling.				
S5	24	38 60 50/4	17-20					N/A	M								
S6	12	38 50/5	20-22					N/A	M								
S7	24	32 46 50/4	22-25					N/A	M								
S8	16	25 40 50/5	25-27					N/A	W			Depth to water at -26 feet.					
S9		32 25 50/5	27-30					N/A	W								
			30-36.5														
End of Boring at 36.5 feet bgs.																	

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

Facility/Project Name WPL - Alliant Columbia Generating Station SCS#: 25217156.01		License/Permit/Monitoring Number		Boring Number MW-311	
Boring Drilled By: Name of crew chief (first, last) and Firm Mark Crampton Badger State Drilling, Co.		Date Drilling Started 2/14/2018		Date Drilling Completed 2/14/2018	
Drilling Method hollow stem auger		WI Unique Well No. VR112		DNR Well ID No.	
Common Well Name MW-311		Final Static Water Level 23.5 Feet MSL		Surface Elevation 806.53 Feet MSL	
Borehole Diameter 8.5 in.		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>		Local Grid Location	
State Plane 542,874 N, 2,123,437 E S/C/N		Lat _____ "		Feet <input type="checkbox"/> N <input type="checkbox"/> E	
NE 1/4 of SW 1/4 of Section 27, T 12 N, R 9 E		Long _____ "		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Columbia		County Code 11	
				Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments
										Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1-8	Hydrovaced boring to 8 feet below ground surface; open hole.											
S1	24	12 16 20 24	9-10	POORLY GRADED SAND AND GRAVEL, fine to coarse sand, coarse gravel, yellow, (10YR 7/6), rounded sand, angular gravel.						N/A	M				
S2	24	17 27 30 38	12	Same as above but with trace silt.	SP					N/A	M				
S3	24	18 26 31	14							N/A	M				

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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-311**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			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				
S5	24	30 40 45	19						N/A	M				
S6	8	45 34 50/3	22						N/A	M+/W				
S7	18	46 50/5	24			SP			N/A	W				Depth to water at ~ 25 feet.
S8	20	46 54 54 50/4	27						N/A	W				
S9	24	25 38 50/5	29		Same as above but with thin silt seams.				N/A	W				
			33		End of Boring at 33 feet bgs.									

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. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin _____ (estimated: <input type="checkbox"/>) 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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number _____ Badger State Drilling

A. Protective pipe, top elevation --- 807.16 ft. MSL	1. Cap and lock? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation --- 806.89 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in. b. Length: --- 5 ft. c. Material: Steel <input checked="" type="checkbox"/> 0 4 Other <input type="checkbox"/>
C. Land surface elevation --- 803.69 ft. MSL	d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
D. Surface seal, bottom --- 791.69 ft. MSL or --- 12 ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 3 0 Concrete <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 3 0 Other <input type="checkbox"/>
13. Sieve analysis performed? <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 3 3 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 3 5 c. _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 3 1 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 5 0 e. _____ Ft ³ volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 5 0 Hollow Stem Auger <input checked="" type="checkbox"/> 4 1 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 0 1 Tremie pumped <input type="checkbox"/> 0 2 Gravity <input type="checkbox"/> 0 8
15. Drilling fluid used: Water <input type="checkbox"/> 0 2 Air <input type="checkbox"/> 0 1 Drilling Mud <input type="checkbox"/> 0 3 None <input checked="" type="checkbox"/> 9 9	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 3 3 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 3 2 c. _____ 4 ft ³ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. Fine sand material: Manufacturer, product name & mesh size a. _____ RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added _____ 0.5 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. _____ RW Sidley #5 <input type="checkbox"/> b. Volume added _____ 2 ft ³
17. Source of water (attach analysis, if required): _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 2 3 Flush threaded PVC schedule 80 <input type="checkbox"/> 2 4 Other <input type="checkbox"/>
E. Bentonite seal, top --- 803.69 ft. MSL or --- 0 ft.	10. Screen material: _____ PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 1 1 Continuous slot <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
F. Fine sand, top --- 791.69 ft. MSL or --- 12 ft.	b. Manufacturer _____ Johnson c. Slot size: 0.01 in. d. Slotted length: --- 10 ft.
G. Filter pack, top --- 789.69 ft. MSL or --- 14 ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 1 4 Other <input checked="" type="checkbox"/>
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.	

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

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

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

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

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

A. Protective pipe, top elevation	813.59 ft. MSL	1. Cap and lock?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation	813.28 ft. MSL	2. Protective cover pipe:	
C. Land surface elevation	809.88 ft. MSL	a. Inside diameter:	6 in.
D. Surface seal, bottom	807.61 ft. MSL or 2.27 ft.	b. Length:	5 ft.
		c. Material:	Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
12. USCS classification of soil near screen:		d. Additional protection?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/>		If yes, describe: _____	
SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/>		3. Surface seal:	Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
Bedrock <input type="checkbox"/>		4. Material between well casing and protective pipe:	Bentonite <input type="checkbox"/> 30 Filter Sand (#5) <input checked="" type="checkbox"/>
13. Sieve analysis performed?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5. Annular space seal:	a. Granular/Chipped Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 e. 0.342 Ft ³ volume added for any of the above
14. Drilling method used:	Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed:	Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		6. Bentonite seal:	a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		7. Fine sand material: Manufacturer, product name & mesh size	a. RW Sidley #7 (1 bag) <input checked="" type="checkbox"/>
Describe _____		b. Volume added _____ ft ³	
17. Source of water (attach analysis, if required):		8. Filter pack material: Manufacturer, product name & mesh size	a. RW Sidley #5 (6 bags) <input checked="" type="checkbox"/>
_____		b. Volume added _____ ft ³	
E. Bentonite seal, top	807.61 ft. MSL or 2.27 ft.	9. Well casing:	Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
F. Fine sand, top	788.61 ft. MSL or 21.27 ft.	10. Screen material:	PVC
G. Filter pack, top	786.61 ft. MSL or 23.27 ft.	a. Screen type:	Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
H. Screen joint, top	785.61 ft. MSL or 24.27 ft.	b. Manufacturer	Monoflex
I. Well bottom	775.61 ft. MSL or 34.27 ft.	c. Slot size:	0.010 in.
J. Filter pack, bottom	773.38 ft. MSL or 36.5 ft.	d. Slotted length:	10 ft.
K. Borehole, bottom	773.38 ft. MSL or 36.5 ft.	11. Backfill material (below filter pack):	None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
L. Borehole, diameter	8.5 in.		
M. O.D. well casing	2.38 in.		
N. I.D. well casing	2.01 in.		

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**

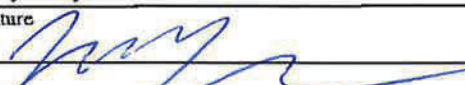
Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, 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.

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

Facility/Project Name WPL-Columbia Generating Station	Local Grid Location of Well 543331.971 ft. <input checked="" type="checkbox"/> N. <input type="checkbox"/> S. 2123879.85 ft. <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-310
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. " Long. " or	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
Facility ID	St. Plane _____ ft. N. _____ ft. E. S/C/N	Date Well Installed <u>02</u> / <u>13</u> / <u>2018</u> 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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Dave Cruise
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source <input type="checkbox"/> Upgradient <input type="checkbox"/> Sidegradient <input checked="" type="checkbox"/> Downgradient <input type="checkbox"/> Not Known	Gov. Lot Number _____
Enf. Stds. Apply <input checked="" type="checkbox"/>		Badger State Drilling Co., Inc.

A. Protective pipe, top elevation --- 813.93 ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation --- 813.62 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in.
C. Land surface elevation --- 810.96 ft. MSL	b. Length: --- 5 ft.
D. Surface seal, bottom --- 809.21 ft. MSL or --- 1.75 ft.	c. Material: Steel <input checked="" type="checkbox"/> 0 4 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
13. Sieve analysis performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 3 0 Concrete <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 5 0 Hollow Stem Auger <input checked="" type="checkbox"/> 4 1 Other <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 3 0 Filter Sand (#5) <input checked="" type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 0 2 Air <input type="checkbox"/> 0 1 Drilling Mud <input type="checkbox"/> 0 3 None <input checked="" type="checkbox"/> 9 9	5. Annular space seal: a. Granular/Chipped Bentonite <input checked="" type="checkbox"/> 3 3 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 3 5 c. _____ Lbs/gal mud weight . . . Bentonite slurry <input type="checkbox"/> 3 1 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 5 0 e. 0.369 Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 0 1 Tremie pumped <input type="checkbox"/> 0 2 Gravity <input checked="" type="checkbox"/> 0 8
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe -- _____	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 3 3 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 3 2 c. _____ Other <input type="checkbox"/>
17. Source of water (attach analysis, if required): ---	7. Fine sand material: Manufacturer, product name & mesh size a. RW Sidley #7 (1 bag) <input checked="" type="checkbox"/>
E. Bentonite seal, top --- 809.21 ft. MSL or --- 1.75 ft.	b. Volume added _____ ft ³
F. Fine sand, top --- 789.21 ft. MSL or --- 21.75 ft.	8. Filter pack material: Manufacturer, product name & mesh size a. RW Sidley #5 (7 bags) <input checked="" type="checkbox"/>
G. Filter pack, top --- 787.21 ft. MSL or --- 23.75 ft.	b. Volume added _____ ft ³
H. Screen joint, top --- 785.21 ft. MSL or --- 25.75 ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 2 3 Flush threaded PVC schedule 80 <input type="checkbox"/> 2 4 Other <input type="checkbox"/>
I. Well bottom --- 775.21 ft. MSL or --- 35.75 ft.	10. Screen material: PVC
J. Filter pack, bottom --- 774.46 ft. MSL or --- 36.5 ft.	a. Screen type: Factory cut <input checked="" type="checkbox"/> 1 1 Continuous slot <input type="checkbox"/> 0 1 Other <input type="checkbox"/>
K. Borehole, bottom --- 774.46 ft. MSL or --- 36.5 ft.	b. Manufacturer Monoflex
L. Borehole, diameter --- 8.5 in.	c. Slot size: 0.010 in.
M. O.D. well casing --- 2.38 in.	d. Slotted length: --- 10 ft.
N. I.D. well casing --- 2.01 in.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 1 4 Other <input type="checkbox"/>

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

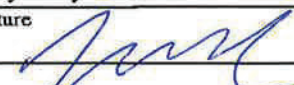
Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, 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.

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

Facility/Project Name WPL-Columbia Generating Station	Local Grid Location of Well 542874.39 ft. <input checked="" type="checkbox"/> N. <input type="checkbox"/> S. 2123437.50 ft. <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-311
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. " Long. " or	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
Facility ID	St. Plane _____ ft. N. _____ ft. E. S/C/N	Date Well Installed <u>02</u> / <u>14</u> / <u>2018</u> m m d d y y y y
Type of Well Well Code <u>11</u> / MW	Section Location of Waste/Source NE 1/4 of SW 1/4 of Sec. 27, T. 12 N, R. 09 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Mark Crampton
Distance from Waste/Source _____ ft.	Enf. Stds. Apply <input checked="" type="checkbox"/>	Gov. Lot Number _____
	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Badger State Drilling Co., Inc.

A. Protective pipe, top elevation --- 810.05 ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation --- 809.74 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in.
C. Land surface elevation --- 806.53 ft. MSL	b. Length: --- 5 ft.
D. Surface seal, bottom --- 803.55 ft. MSL or --- 2.98 ft.	c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
13. Sieve analysis performed? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Filter Sand (#5) <input checked="" type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	5. Annular space seal: a. Granular/Chipped Bentonite <input checked="" type="checkbox"/> 33 b. ___ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. ___ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. ___ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. 0.288 Ft ³ volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe: _____	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. ___ Other <input type="checkbox"/>
17. Source of water (attach analysis, if required): ---	7. Fine sand material: Manufacturer, product name & mesh size a. RW Sidley #7 (1 bag) <input checked="" type="checkbox"/> b. Volume added _____ ft ³
E. Bentonite seal, top --- 803.55 ft. MSL or --- 2.98 ft.	8. Filter pack material: Manufacturer, product name & mesh size a. RW Sidley #5 (6 bags) <input checked="" type="checkbox"/> b. Volume added _____ ft ³
F. Fine sand, top --- 787.55 ft. MSL or --- 18.98 ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
G. Filter pack, top --- 785.55 ft. MSL or --- 20.98 ft.	10. Screen material: PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
H. Screen joint, top --- 783.55 ft. MSL or --- 22.98 ft.	b. Manufacturer Monoflex c. Slot size: 0.010 in. d. Slotted length: --- 10 ft.
I. Well bottom --- 773.55 ft. MSL or --- 32.98 ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
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.	

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.

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

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

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 _____ 75 min.
4. Depth of well (from top of well casing) _____ 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)

- | | | |
|--|---------------------------|--------------------------|
| | <u>Before Development</u> | <u>After Development</u> |
|--|---------------------------|--------------------------|
11. Depth to Water (from top of well casing)
a. _____ 30.07 ft. _____ 32.29 ft.
- Date
b. 02 / 16 / 2018 02 / 16 / 2018
m m d d y y y y m m d d y y y y
- 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 1 0 Clear 2 0
Turbid 1 5 Turbid 2 5
(Describe) (Describe)
- Brown _____
Silly _____
- 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:
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: *Nate Sievers*
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.

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

Facility/Project Name WPL - Alliant Columbia Generating Station	County Name Columbia	Well Name MW-310	
Facility License, Permit or Monitoring Number	County Code 11	Wis. Unique Well Number VR110	DNR Well ID Number

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 _____ 171 min.

4. Depth of well (from top of well casing) _____ 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)

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 30 _____ 55 ft.	_____ 32 _____ 30 ft.
Date	b. <u>2</u> / <u>16</u> / <u>2018</u>	<u>2</u> / <u>16</u> / <u>2018</u>
Time	c. <u>9</u> : <u>45</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>12</u> : <u>36</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) _____	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) _____

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

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: 

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.

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

Facility/Project Name WPL - Alliant Columbia Generating Station	County Name Columbia	Well Name MW-311	
Facility License, Permit or Monitoring Number	County Code 11	Wis. Unique Well Number VR112	DNR Well ID Number

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 casing) _____ 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)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 26.75 ft.	_____ 28.51 ft.
Date	b. <u>2</u> / <u>16</u> / <u>2018</u>	<u>2</u> / <u>16</u> / <u>2018</u>
Time	c. <u>2:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	<u>4:48</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) _____	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) _____

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

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

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

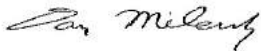
Enclosed are the analytical results for sample(s) received by the laboratory on October 29, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

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

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

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

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

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

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 430492

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2479204

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

LABORATORY CONTROL SAMPLE: 2479205

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2479206 2479207

Parameter	Units	40253959001		2479207		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	ug/L	<0.066	5	5	5.0	4.8	100	95	85-115	5	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 431884 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

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

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

LABORATORY CONTROL SAMPLE: 2487055

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056		2487056		2487057		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		40253965001	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Antimony	ug/L	<0.15	250	250	268	263	107	105	75-125	2	20			
Arsenic	ug/L	0.30J	250	250	260	260	104	104	75-125	0	20			
Barium	ug/L	7.5	250	250	250	245	97	95	75-125	2	20			
Beryllium	ug/L	<0.25	250	250	268	265	107	106	75-125	1	20			
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20			
Cadmium	ug/L	<0.15	250	250	259	254	104	102	75-125	2	20			
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	20	P6		
Chromium	ug/L	<1.0	250	250	251	247	100	99	75-125	1	20			
Cobalt	ug/L	0.46J	250	250	247	244	99	97	75-125	1	20			
Lead	ug/L	<0.24	250	250	260	257	104	103	75-125	1	20			
Lithium	ug/L	0.37J	250	250	272	255	109	102	75-125	6	20			
Molybdenum	ug/L	<0.44	250	250	256	255	102	102	75-125	0	20			
Selenium	ug/L	<0.32	250	250	271	267	108	107	75-125	1	20			
Thallium	ug/L	<0.14	250	250	258	257	103	103	75-125	1	20			

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 430299	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

METHOD BLANK: 2477981 Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

LABORATORY CONTROL SAMPLE: 2477982

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

SAMPLE DUPLICATE: 2477983

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 430502

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253965001, 40253965002

SAMPLE DUPLICATE: 2479241

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

SAMPLE DUPLICATE: 2479545

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

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

QC Batch: 430807 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: 40253965001, 40253965002

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

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

LABORATORY CONTROL SAMPLE: 2480962

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480963 2480964

Parameter	Units	40253965001		2480964		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
Chloride	mg/L	2.3	20	20	24.1	24.2	109	110	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	2.5	2.4	123	121	90-110	2	15	M0	
Sulfate	mg/L	11.6	20	20	32.8	33.1	106	107	90-110	1	15		

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 544795

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: 40253965001, 40253965002

METHOD BLANK: 2644705

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

QC Batch: 544797

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: 40253965001, 40253965002

METHOD BLANK: 2644706

Matrix: Water

Associated Lab Samples: 40253965001, 40253965002

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40253965

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineering

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

WO#: 40253965



Tracking #: _____

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

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

Packing Material: Bubble Wrap Bubble Bags None Other

Thermometer Used SR - 123 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 0 / Corr: 0.2

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 10/11/22 / Initials: SG

Labeled By Initials: NK

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

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

December 02, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222067 COLUMBIA CCR MOD 4
Pace Project No.: 40253964

Dear Meghan Blodgett:

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

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

- Pace Analytical Services - Green Bay

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40253964001	MW-309	Water	10/26/22 14:20	10/29/22 09:15
40253964002	MW-310	Water	10/26/22 15:35	10/29/22 09:15
40253964003	MW-311	Water	10/27/22 10:10	10/29/22 09:15
40253964004	FIELD BLANK MOD4	Water	10/26/22 15:35	10/29/22 09:15

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40253964001	MW-309	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253964002	MW-310	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253964003	MW-311	EPA 6020B	KXS	2
			JXA	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40253964004	FIELD BLANK MOD4	EPA 6020B	KXS	2
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Sample: MW-309 **Lab ID: 40253964001** Collected: 10/26/22 14:20 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay							
Boron	46.6	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 14:24	7440-42-8	
Calcium	162000	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 14:24	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.23	Std. Units			1		10/26/22 14:20		
Field Specific Conductance	2,591	umhos/cm			1		10/26/22 14:20		
Oxygen, Dissolved	8.49	mg/L			1		10/26/22 14:20	7782-44-7	
REDOX	41.0	mV			1		10/26/22 14:20		
Turbidity	1.81	NTU			1		10/26/22 14:20		
Static Water Level	781.50	feet			1		10/26/22 14:20		
Temperature, Water (C)	12.9	deg C			1		10/26/22 14:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	1670	mg/L	20.0	8.7	1		11/01/22 11:30		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	796	mg/L	40.0	8.6	20		11/09/22 04:56	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/08/22 18:24	16984-48-8	
Sulfate	28.9	mg/L	2.0	0.44	1		11/08/22 18:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Sample: MW-310 **Lab ID: 40253964002** Collected: 10/26/22 15:35 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Boron	71.3	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 14:31	7440-42-8	
Calcium	68900	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 14:31	7440-70-2	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.61	Std. Units			1		10/26/22 15:35		
Field Specific Conductance	1,404	umhos/cm			1		10/26/22 15:35		
Oxygen, Dissolved	8.66	mg/L			1		10/26/22 15:35	7782-44-7	
REDOX	31.3	mV			1		10/26/22 15:35		
Turbidity	1.58	NTU			1		10/26/22 15:35		
Static Water Level	780.96	feet			1		10/26/22 15:35		
Temperature, Water (C)	13.0	deg C			1		10/26/22 15:35		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	750	mg/L	20.0	8.7	1		11/01/22 11:31		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.7	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	323	mg/L	20.0	4.3	10		11/09/22 05:11	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/08/22 18:39	16984-48-8	
Sulfate	32.8	mg/L	2.0	0.44	1		11/08/22 18:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

Sample: MW-311 **Lab ID: 40253964003** Collected: 10/27/22 10:10 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS		Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay							
Boron	34.2	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 14:38	7440-42-8	
Calcium	66300	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 14:38	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.50	Std. Units			1		10/27/22 10:10		
Field Specific Conductance	487.0	umhos/cm			1		10/27/22 10:10		
Oxygen, Dissolved	8.92	mg/L			1		10/27/22 10:10	7782-44-7	
REDOX	34.5	mV			1		10/27/22 10:10		
Turbidity	0.00	NTU			1		10/27/22 10:10		
Static Water Level	781.23	feet			1		10/27/22 10:10		
Temperature, Water (C)	11.9	deg C			1		10/27/22 10:10		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	268	mg/L	20.0	8.7	1		11/01/22 11:31		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	1.2J	mg/L	2.0	0.43	1		11/08/22 18:54	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/08/22 18:54	16984-48-8	
Sulfate	15.5	mg/L	2.0	0.44	1		11/08/22 18:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR MOD 4
Pace Project No.: 40253964

Sample: FIELD BLANK MOD4 **Lab ID: 40253964004** Collected: 10/26/22 15:35 Received: 10/29/22 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Boron	<3.0	ug/L	10.0	3.0	1	11/18/22 06:38	11/30/22 15:30	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	11/18/22 06:38	11/30/22 15:30	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		11/01/22 11:31		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.1	Std. Units	0.10	0.010	1		11/03/22 13:55		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		11/08/22 19:09	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		11/08/22 19:09	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		11/08/22 19:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 4
Pace Project No.: 40253964

QC Batch: 431884 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

METHOD BLANK: 2487054 Matrix: Water
Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	11/30/22 12:41	
Calcium	ug/L	<76.2	254	11/30/22 12:41	

LABORATORY CONTROL SAMPLE: 2487055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	253	101	80-120	
Calcium	ug/L	10000	10200	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487056 2487057

Parameter	Units	40253965001		2487056		2487057		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Boron	ug/L	37.5	250	250	295	282	103	98	75-125	5	20
Calcium	ug/L	62800	10000	10000	72700	69600	99	69	75-125	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 4
Pace Project No.: 40253964

QC Batch: 430299 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

METHOD BLANK: 2477981 Matrix: Water
Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

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

LABORATORY CONTROL SAMPLE: 2477982

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

SAMPLE DUPLICATE: 2477983

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

QC Batch: 430502

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

SAMPLE DUPLICATE: 2479241

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

SAMPLE DUPLICATE: 2479545

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

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

QC Batch:	430680	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: 40253964001, 40253964002, 40253964003, 40253964004

METHOD BLANK: 2480305 Matrix: Water
Associated Lab Samples: 40253964001, 40253964002, 40253964003, 40253964004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	11/08/22 15:11	
Fluoride	mg/L	<0.095	0.32	11/08/22 15:11	
Sulfate	mg/L	<0.44	2.0	11/08/22 15:11	

LABORATORY CONTROL SAMPLE: 2480306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.6	108	90-110	
Fluoride	mg/L	2	2.1	106	90-110	
Sulfate	mg/L	20	21.6	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2480307 2480308

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40253823001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	275	200	200	462	457	94	91	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	1.5	1.5	75	76	90-110	0	15	M0	
Sulfate	mg/L	34.3	200	200	248	242	107	104	90-110	3	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222067 COLUMBIA CCR MOD 4

Pace Project No.: 40253964

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR MOD 4
Pace Project No.: 40253964

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40253964001	MW-309	EPA 3010A	431884	EPA 6020B	431956
40253964002	MW-310	EPA 3010A	431884	EPA 6020B	431956
40253964003	MW-311	EPA 3010A	431884	EPA 6020B	431956
40253964004	FIELD BLANK MOD4	EPA 3010A	431884	EPA 6020B	431956
40253964001	MW-309				
40253964002	MW-310				
40253964003	MW-311				
40253964001	MW-309	SM 2540C	430299		
40253964002	MW-310	SM 2540C	430299		
40253964003	MW-311	SM 2540C	430299		
40253964004	FIELD BLANK MOD4	SM 2540C	430299		
40253964001	MW-309	EPA 9040	430502		
40253964002	MW-310	EPA 9040	430502		
40253964003	MW-311	EPA 9040	430502		
40253964004	FIELD BLANK MOD4	EPA 9040	430502		
40253964001	MW-309	EPA 300.0	430680		
40253964002	MW-310	EPA 300.0	430680		
40253964003	MW-311	EPA 300.0	430680		
40253964004	FIELD BLANK MOD4	EPA 300.0	430680		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Effective Date: 8/16/2022

Client Name: SCS Engineering

Sample Preservation Receipt Form
Project # 402539164

All containers needing preservation have been checked and noted below:

Yes No N/A

Initial when completed SE

Date/Time:

Lab Lot# of pH paper: W000780

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

Pace Lab #	Glass						Plastic						Vials					Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≤9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)							
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JG9U	JG9U	WG9U	WPFU	SP5T	ZPLC	GN 1								GN 2						
001																																							
003																																							
005																																							
007																																							
009																																							
011																																							
013																																							
015																																							
017																																							
019																																							


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	JG9U	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	WG9U	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	

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineering
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

WO#: 40253964

 40253964

Tracking #: _____
 Custody Seal on Cooler/Box Present: yes no Seals intact: yes no
 Custody Seal on Samples Present: yes no Seals intact: yes no
 Packing Material: Bubble Wrap Bubble Bags None Other
 Thermometer Used SR-123 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 0 /Corr: 0.2
 Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:
 Date: 10/3/22 Initials: SS
 Labeled By Initials: NK

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

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

December 29, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

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

Dear Meghan Blodgett:

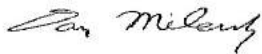
Enclosed are the analytical results for sample(s) received by the laboratory on December 14, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise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

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

- Pace Analytical Services - Green Bay

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

QC Batch: 434044

Analysis Method: EPA 6020B

QC Batch Method: EPA 3010A

Analysis Description: 6020B MET

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40255945001, 40255945002

METHOD BLANK: 2498851

Matrix: Water

Associated Lab Samples: 40255945001, 40255945002

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

LABORATORY CONTROL SAMPLE: 2498852

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2498853 2498854

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

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222067 COLUMBIA CCR BACKGRND

Pace Project No.: 40255945

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY / Analytical Request Document

40253965

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

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

Section A

Required Client Information: Company: SCS ENGINEERS, Address: 2830 Dairy Drive, Madison, WI 53718, Email: mbloggett@scsengineers.com, Phone: 608-216-7352, Fax, Requested Due Date

Section B

Required Project Information: Report To: Meghan Blodgett, Copy To, Purchase Order #, Project Name: 25219067 Columbia CCR Background, Project #: 25222067

Section C

Invoice Information: Attention: Company Name: Address: Pace Quote: Pace Project Manager: dan.milewsky@pacelabs.com, Pace Profile #: 3946-12

Page : 1 Of 1

Table with columns for ITEM #, MATRIX CODE, SAMPLE ID, COLLECTED (START/END), PRESERVATIVES, ANALYSES TEST, REQUESTED ANALYSIS FILTERED (Y/N), and RESIDUAL CHLORINE (Y/N).

Table with columns for ADDITIONAL COMMENTS, RELINQUISHED BY / AFFILIATION, DATE, TIME, ACCEPTED BY / AFFILIATION, DATE, TIME, and SAMPLE CONDITIONS.

Table for SAMPLER NAME AND SIGNATURE, PRINT Name of SAMPLER, SIGNATURE of SAMPLER, DATE Signed, and TEMPERATURE related fields.

December 30, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

Dear Meghan Blodgett:

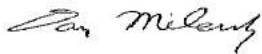
Enclosed are the analytical results for sample(s) received by the laboratory on December 03, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40255561001	MW-84A	Water	12/02/22 12:15	12/03/22 09:00
40255561002	MW-301	Water	12/02/22 13:00	12/03/22 09:00
40255561003	MW-33AR	Water	12/02/22 09:25	12/03/22 09:00
40255561004	MW-34A	Water	12/02/22 10:10	12/03/22 09:00
40255561005	MW-302	Water	12/02/22 11:05	12/03/22 09:00
40255561006	MW-309	Water	11/30/22 14:20	12/03/22 09:00
40255561007	MW-310	Water	11/30/22 15:40	12/03/22 09:00
40255561008	MW-311	Water	11/30/22 16:20	12/03/22 09:00
40255561009	FIELD BLANK MOD1-3LF	Water	12/02/22 11:05	12/03/22 09:00
40255561010	FIELD BLANK MOD4	Water	11/30/22 15:40	12/03/22 09:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40255561001	MW-84A	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561002	MW-301	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561003	MW-33AR	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561004	MW-34A	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561005	MW-302	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561006	MW-309	EPA 6010D	SIS	7
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561007	MW-310	EPA 6010D	SIS	6
			KPR	7
		EPA 300.0	HMB	1
		EPA 310.2	DAW	1
40255561008	MW-311	EPA 6010D	SIS	5
			KPR	7
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561009	FIELD BLANK MOD1-3LF	EPA 6010D	SIS	5
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1
40255561010	FIELD BLANK MOD4	EPA 6010D	SIS	5

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Lab ID	Sample ID	Method	Analysts	Analytes Reported
		EPA 310.2	DAW	1
		EPA 353.2	DAW	1

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

Sample: MW-84A **Lab ID: 40255561001** Collected: 12/02/22 12:15 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:10	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:10	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:10	7440-22-4	
Total Hardness by 2340B	350	mg/L	54.0	10.0	10	12/12/22 13:14	12/14/22 13:52		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:10	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.29	Std. Units			1		12/02/22 12:15		
Field Specific Conductance	595.4	umhos/cm			1		12/02/22 12:15		
Oxygen, Dissolved	8.12	mg/L			1		12/02/22 12:15	7782-44-7	
REDOX	123.0	mV			1		12/02/22 12:15		
Turbidity	0.00	NTU			1		12/02/22 12:15		
Static Water Level	784.76	feet			1		12/02/22 12:15		
Temperature, Water (C)	11.0	deg C			1		12/02/22 12:15		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	345	mg/L	25.0	7.4	1		12/07/22 12:24		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.43	mg/L	0.25	0.059	1		12/14/22 12:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-301 **Lab ID: 40255561002** Collected: 12/02/22 13:00 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	4.3J	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:18	7440-50-8	
Manganese	47.2	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:18	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:18	7440-22-4	
Total Hardness by 2340B	384	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:18		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:18	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	6.84	Std. Units			1		12/02/22 13:00		
Field Specific Conductance	637.3	umhos/cm			1		12/02/22 13:00		
Oxygen, Dissolved	0.61	mg/L			1		12/02/22 13:00	7782-44-7	
REDOX	120.0	mV			1		12/02/22 13:00		
Turbidity	0.00	NTU			1		12/02/22 13:00		
Static Water Level	785.12	feet			1		12/02/22 13:00		
Temperature, Water (C)	10.3	deg C			1		12/02/22 13:00		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	361	mg/L	25.0	7.4	1		12/07/22 12:25		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.15J	mg/L	0.25	0.059	1		12/14/22 12:09		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-33AR **Lab ID: 40255561003** Collected: 12/02/22 09:25 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:21	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:21	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:21	7440-22-4	
Total Hardness by 2340B	319	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:21		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:21	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.48	Std. Units			1		12/02/22 09:25		
Field Specific Conductance	725	umhos/cm			1		12/02/22 09:25		
Oxygen, Dissolved	9.01	mg/L			1		12/02/22 09:25	7782-44-7	
REDOX	141.6	mV			1		12/02/22 09:25		
Turbidity	0.12	NTU			1		12/02/22 09:25		
Static Water Level	781.91	feet			1		12/02/22 09:25		
Temperature, Water (C)	10.8	deg C			1		12/02/22 09:25		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	206	mg/L	25.0	7.4	1		12/07/22 12:26		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	1.9	mg/L	0.25	0.059	1		12/14/22 12:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-34A **Lab ID: 40255561004** Collected: 12/02/22 10:10 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:23	7440-50-8	
Manganese	2.6J	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:23	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:23	7440-22-4	
Total Hardness by 2340B	335	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:23		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:23	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.45	Std. Units			1		12/02/22 10:10		
Field Specific Conductance	614.3	umhos/cm			1		12/02/22 10:10		
Oxygen, Dissolved	8.67	mg/L			1		12/02/22 10:10	7782-44-7	
REDOX	130.4	mV			1		12/02/22 10:10		
Turbidity	2.51	NTU			1		12/02/22 10:10		
Static Water Level	783.71	feet			1		12/02/22 10:10		
Temperature, Water (C)	12.4	deg C			1		12/02/22 10:10		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	188	mg/L	25.0	7.4	1		12/07/22 12:27		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	4.7	mg/L	0.25	0.059	1		12/14/22 12:10		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

Sample: MW-302 **Lab ID: 40255561005** Collected: 12/02/22 11:05 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:29	7440-50-8	
Manganese	2.0J	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:29	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:29	7440-22-4	
Total Hardness by 2340B	388	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:29		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:29	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.21	Std. Units			1		12/02/22 11:05		
Field Specific Conductance	662.0	umhos/cm			1		12/02/22 11:05		
Oxygen, Dissolved	8.41	mg/L			1		12/02/22 11:05	7782-44-7	
REDOX	127.6	mV			1		12/02/22 11:05		
Turbidity	0.28	NTU			1		12/02/22 11:05		
Static Water Level	784.48	feet			1		12/02/22 11:05		
Temperature, Water (C)	11.0	deg C			1		12/02/22 11:05		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	302	mg/L	50.0	14.9	2		12/07/22 12:28		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	7.1	mg/L	0.25	0.059	1		12/14/22 12:11		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-309 **Lab ID: 40255561006** Collected: 11/30/22 14:20 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Boron	49.3	ug/L	40.0	17.3	1	12/12/22 13:14	12/13/22 20:31	7440-42-8	
Calcium	153000	ug/L	500	114	1	12/12/22 13:14	12/13/22 20:31	7440-70-2	
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:31	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:31	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:31	7440-22-4	
Total Hardness by 2340B	678	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:31		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:31	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.30	Std. Units			1		11/30/22 14:20		
Field Specific Conductance	2746	umhos/cm			1		11/30/22 14:20		
Oxygen, Dissolved	8.97	mg/L			1		11/30/22 14:20	7782-44-7	
REDOX	155.5	mV			1		11/30/22 14:20		
Turbidity	0.31	NTU			1		11/30/22 14:20		
Static Water Level	781.62	feet			1		11/30/22 14:20		
Temperature, Water (C)	7.7	deg C			1		11/30/22 14:20		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	231	mg/L	25.0	7.4	1		12/07/22 12:31		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	1.2	mg/L	0.25	0.059	1		12/14/22 12:14		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-310 **Lab ID: 40255561007** Collected: 11/30/22 15:40 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP		Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay							
Calcium	55500	ug/L	500	114	1	12/12/22 13:14	12/13/22 20:33	7440-70-2	
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:33	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:33	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:33	7440-22-4	
Total Hardness by 2340B	397	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:33		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:33	7440-66-6	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.67	Std. Units			1		11/30/22 15:40		
Field Specific Conductance	1200	umhos/cm			1		11/30/22 15:40		
Oxygen, Dissolved	9.46	mg/L			1		11/30/22 15:40	7782-44-7	
REDOX	146.5	mV			1		11/30/22 15:40		
Turbidity	0.51	NTU			1		11/30/22 15:40		
Static Water Level	781.14	feet			1		11/30/22 15:40		
Temperature, Water (C)	10.8	deg C			1		11/30/22 15:40		
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	215	mg/L	10.0	2.2	5		12/28/22 16:32	16887-00-6	
310.2 Alkalinity		Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay							
Alkalinity, Total as CaCO3	270	mg/L	25.0	7.4	1		12/07/22 12:32		
353.2 Nitrogen, NO2/NO3 pres.		Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay							
Nitrogen, NO2 plus NO3	0.74	mg/L	0.25	0.059	1		12/14/22 12:14		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: MW-311 **Lab ID: 40255561008** Collected: 11/30/22 16:20 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:35	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:35	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:35	7440-22-4	
Total Hardness by 2340B	284	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:35		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:35	7440-66-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.49	Std. Units			1		11/30/22 16:20		
Field Specific Conductance	492.2	umhos/cm			1		11/30/22 16:20		
Oxygen, Dissolved	9.21	mg/L			1		11/30/22 16:20	7782-44-7	
REDOX	132.0	mV			1		11/30/22 16:20		
Turbidity	0.17	NTU			1		11/30/22 16:20		
Static Water Level	781.15	feet			1		11/30/22 16:20		
Temperature, Water (C)	10.3	deg C			1		11/30/22 16:20		
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	270	mg/L	50.0	14.9	2		12/07/22 12:37		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.47	mg/L	0.25	0.059	1		12/14/22 12:15		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: FIELD BLANK MOD1-3LF **Lab ID:** 40255561009 Collected: 12/02/22 11:05 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:37	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:37	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:37	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:37		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:37	7440-66-6	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	8.0J	mg/L	25.0	7.4	1		12/07/22 12:40		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		12/14/22 12:16		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

Sample: FIELD BLANK MOD4 **Lab ID: 40255561010** Collected: 11/30/22 15:40 Received: 12/03/22 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	12/12/22 13:14	12/13/22 20:39	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	12/12/22 13:14	12/13/22 20:39	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	12/12/22 13:14	12/13/22 20:39	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	12/12/22 13:14	12/13/22 20:39		
Zinc	<11.6	ug/L	40.0	11.6	1	12/12/22 13:14	12/13/22 20:39	7440-66-6	
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		12/07/22 12:41		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		12/14/22 12:16		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

QC Batch: 433474 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010D MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

METHOD BLANK: 2495648 Matrix: Water
Associated Lab Samples: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<17.3	40.0	12/13/22 20:06	
Calcium	ug/L	<114	500	12/13/22 20:06	
Copper	ug/L	<3.4	10.0	12/13/22 20:06	
Manganese	ug/L	<1.5	5.0	12/13/22 20:06	
Silver	ug/L	<3.2	10.0	12/13/22 20:06	
Total Hardness by 2340B	mg/L	<1.0	5.4	12/13/22 20:06	
Zinc	ug/L	<11.6	40.0	12/13/22 20:06	

LABORATORY CONTROL SAMPLE: 2495649

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	247	99	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Copper	ug/L	250	261	104	80-120	
Manganese	ug/L	250	260	104	80-120	
Silver	ug/L	125	116	93	80-120	
Total Hardness by 2340B	mg/L		67.4			
Zinc	ug/L	250	252	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2495650 2495651

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40255561001 Result	Spike Conc.	Spike Conc.	Conc.								
Boron	ug/L	<17.3	250	250	250	263	265	100	101	75-125	1	20	
Calcium	ug/L	75200	10000	10000	10000	85700	85700	105	104	75-125	0	20	
Copper	ug/L	<3.4	250	250	250	263	265	105	105	75-125	1	20	
Manganese	ug/L	<1.5	250	250	250	260	260	104	104	75-125	0	20	
Silver	ug/L	<3.2	125	125	125	118	118	94	94	75-125	0	20	
Total Hardness by 2340B	mg/L	350				416	416				0	20	
Zinc	ug/L	<11.6	250	250	250	253	252	100	100	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

QC Batch: 433928	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: 40255561007

METHOD BLANK: 2497712 Matrix: Water

Associated Lab Samples: 40255561007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	12/29/22 01:28	

LABORATORY CONTROL SAMPLE: 2497713

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2497714 2497715

Parameter	Units	2497714		2497715		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		40255416003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Chloride	mg/L	719J	20000	20000	22500	21300	109	103	90-110	5	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

QC Batch:	433127	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: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

METHOD BLANK: 2493238 Matrix: Water

Associated Lab Samples: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	12/07/22 12:18	

LABORATORY CONTROL SAMPLE: 2493239

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	99.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2493240 2493241

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40255561005 Result	Spike Conc.	Spike Conc.	Conc.								
Alkalinity, Total as CaCO3	mg/L	302	200	200	504	506	101	102	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2493242 2493243

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40255561008 Result	Spike Conc.	Spike Conc.	Conc.								
Alkalinity, Total as CaCO3	mg/L	270	200	200	476	472	103	101	90-110	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

QC Batch: 433750 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

METHOD BLANK: 2496502 Matrix: Water
Associated Lab Samples: 40255561001, 40255561002, 40255561003, 40255561004, 40255561005, 40255561006, 40255561007, 40255561008, 40255561009, 40255561010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	12/14/22 12:00	

LABORATORY CONTROL SAMPLE: 2496503

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.6	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2496504 2496505

Parameter	Units	40255416011 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Nitrogen, NO2 plus NO3	mg/L	3.1	2.5	2.5	5.7	5.6	102	99	90-110	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2496506 2496507

Parameter	Units	40255582004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Limits	RPD	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.5	2.6	2.6	104	103	90-110	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: WPL-COLUMBIA ENERGY CENTER

Pace Project No.: 40255561

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: WPL-COLUMBIA ENERGY CENTER
Pace Project No.: 40255561

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40255561001	MW-84A	EPA 3010A	433474	EPA 6010D	433648
40255561002	MW-301	EPA 3010A	433474	EPA 6010D	433648
40255561003	MW-33AR	EPA 3010A	433474	EPA 6010D	433648
40255561004	MW-34A	EPA 3010A	433474	EPA 6010D	433648
40255561005	MW-302	EPA 3010A	433474	EPA 6010D	433648
40255561006	MW-309	EPA 3010A	433474	EPA 6010D	433648
40255561007	MW-310	EPA 3010A	433474	EPA 6010D	433648
40255561008	MW-311	EPA 3010A	433474	EPA 6010D	433648
40255561009	FIELD BLANK MOD1-3LF	EPA 3010A	433474	EPA 6010D	433648
40255561010	FIELD BLANK MOD4	EPA 3010A	433474	EPA 6010D	433648
40255561001	MW-84A				
40255561002	MW-301				
40255561003	MW-33AR				
40255561004	MW-34A				
40255561005	MW-302				
40255561006	MW-309				
40255561007	MW-310				
40255561008	MW-311				
40255561007	MW-310	EPA 300.0	433928		
40255561001	MW-84A	EPA 310.2	433127		
40255561002	MW-301	EPA 310.2	433127		
40255561003	MW-33AR	EPA 310.2	433127		
40255561004	MW-34A	EPA 310.2	433127		
40255561005	MW-302	EPA 310.2	433127		
40255561006	MW-309	EPA 310.2	433127		
40255561007	MW-310	EPA 310.2	433127		
40255561008	MW-311	EPA 310.2	433127		
40255561009	FIELD BLANK MOD1-3LF	EPA 310.2	433127		
40255561010	FIELD BLANK MOD4	EPA 310.2	433127		
40255561001	MW-84A	EPA 353.2	433750		
40255561002	MW-301	EPA 353.2	433750		
40255561003	MW-33AR	EPA 353.2	433750		
40255561004	MW-34A	EPA 353.2	433750		
40255561005	MW-302	EPA 353.2	433750		
40255561006	MW-309	EPA 353.2	433750		
40255561007	MW-310	EPA 353.2	433750		
40255561008	MW-311	EPA 353.2	433750		
40255561009	FIELD BLANK MOD1-3LF	EPA 353.2	433750		
40255561010	FIELD BLANK MOD4	EPA 353.2	433750		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CHAIN-OF-CUSTODY Analytical Request Document

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

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

Company: **SCS Engineers** Billing Information: *Same*

Address: **2830 Paicy Dr, Madison WI**

Report To: **Meghan Blodgett** Email To: **MBlodgett@scsengineers.com**

Copy To: **Thomas Karowski** Site Collection Info/Address: **W8375 Murray Rd.**

Customer Project Name/Number: **WPL-Columbia Energy Center WI** State: **WI** County/City: **Purdewille** Time Zone Collected: [] PT [] MT [] ET

Phone: **608-224-2830** Site/Facility ID #: _____ Compliance Monitoring? Yes [] No

Collected By (print): **Adam Watson** Purchase Order #: _____ DW PWS ID #: _____ Quote #: _____ DW Location Code: _____

Collected By (signature): *[Signature]* Turnaround Date Required: _____ Immediately Packed on Ice: Yes [] No

Sample Disposal: [] Dispose as appropriate [] Return [] Archive: _____ Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day [] Hold: _____ Field Filtered (if applicable): [] Yes No Analysis: _____

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns
			Date	Time	Date	Time		
MW-84A	GW	Grab			12/2/22	1215		
MW-301						1300		
MW-33AR						925		
MW-34A						1010		
MW-302						1105		
MW-309					11/30/22	1420		
MW-310						1540		
MW-311						1620		
① Fieldblank MODZ-3LF					12/2/22	1105		
② Fieldblank					11/30/22	1540		

40255561
ALL SHADED AREAS are for LAB USE ONLY

Container Preservative Type ** [1] [3] [2] Lab Project Manager: _____

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

Analyses				Lab Profile/Line:			
Metals + Hardness	Alkalinity	Nitrate + Nitrite		Lab Sample Receipt Checklist:			
				Custody Seals Present/Intact	Y	N	NA
				Custody Signatures Present	Y	N	NA
				Collector Signature Present	Y	N	NA
				Bottles Intact	Y	N	NA
				Correct Bottles	Y	N	NA
				Sufficient Volume	Y	N	NA
				Samples Received on Ice	Y	N	NA
				VOA - Headspace Acceptable	Y	N	NA
				USDA Regulated Soils	Y	N	NA
	Samples in Holding Time	Y	N	NA			
	Residual Chlorine Present	Y	N	NA			
	Cl Strips:						
	Sample pH Acceptable	Y	N	NA			
	pH Strips:						
	Sulfide Present	Y	N	NA			
	Lead Acetate Strips:						
				LAB USE ONLY: Lab Sample # / Comments:			

Customer Remarks / Special Conditions / Possible Hazards: _____
Type of Ice Used: Wet Blue Dry None Blue
Packing Material Used: *See SCW 12/2/22 MP*
Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A
Lab Tracking #: **2785233**
Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID: _____
Cooler 1 Temp Upon Receipt: _____ °C
Cooler 1 Therm Corr. Factor: _____ °C
Cooler 1 Corrected Temp: _____ °C
Comments:

Relinquished by/Company: (Signature) *[Signature]* SCS Date/Time: **12/2/22 1520**
Relinquished by/Company: (Signature) *[Signature]* Logistics Date/Time: **900 12/2/22**
Relinquished by/Company: (Signature) _____ Date/Time: _____

Received by/Company: (Signature) _____ Date/Time: _____
Received by/Company: (Signature) *[Signature]* Date/Time: **900 12/2/22**
Received by/Company: (Signature) _____ Date/Time: _____

MTIL LAB USE ONLY
Table #: _____
Acctnum: _____
Template: _____
Prelogin: _____
PM: _____
PB: _____
Trip Blank Received: Y N NA
HCL MeOH TSP Other
Non Conformance(s): _____ Page 22 of 26
YES / NO of: _____

① + ② Lab added to LOC per PM, received with other samples in shipment 12/2/22 mp

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SCS

WO#: **40255561**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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 - 124 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr. 2° / Corr: 2°

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

Person examining contents:
 Date: 12/2/22 Initials: MP
 Labeled By Initials: JW

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

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay, Pace IR, Non-Pace</u>		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W</u>		<u>006 BP35 "MW-310"</u> <u>placed by LMP</u> <u>12/2/22</u> <u>MP</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 log in

Table 2. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Columbia Energy Center / SCS Engineers Project #25219067

Parameter	COC #1 - Background Wells		COC #2 - Landfill Modules 1-3						COC #3 - Landfill Modules 4-6				Primary Pond			Secondary Pond							
	MW-301	MW-84A	MW-302	MW-33AR	MW-34A	MW-93A	MW-93B	MW-312	FIELD BLANK - MOD1-3IF	MW-309	MW-310	MW-311	FIELD BLANK - MOD4	MW-303	MW-304	MW-305	M-4R	FIELD BLANK - PPOND	MW-306	MW-307	MW-308	FIELD BLANK - SCPOND	
Appendix III Parameters (Detection Monitoring)	Boron																						
	Calcium																						
	Chloride																						
	Fluoride																						
	pH																						
	Sulfate																						
	TDS																						
	Antimony																						
	Arsenic																						
	Barium																						
	Beryllium																						
	Cadmium																						
	Chromium																						
	Cobalt																						
	Fluoride																						
	Lead																						
	Lithium																						
Mercury																							
Molybdenum																							
Selenium																							
Thallium																							
Radium 226+228																							
Additional WDNR Parameters	Alkalinity	X	X	X	X	X	X						X	X	X	X							
	Hardness	X	X	X	X	X	X						X	X	X	X							
	Nitrate + Nitrite as N	X	X	X	X	X	X						X	X	X	X							
	Copper	X	X	X	X	X	X						X	X	X	X							
	Manganese	X	X	X	X	X	X						X	X	X	X							
	Silver	X	X	X	X	X	X						X	X	X	X							
	Zinc	X	X	X	X	X	X						X	X	X	X							
CCR Rule Field Parameters	Groundwater Elevation	X	X	X	X	X	X						X	X	X	X							
	pH	X	X	X	X	X	X						X	X	X	X							
Low-Flow Sampling Field Parameters	Well Depth																						
	Specific Conductance	X	X	X	X	X	X						X	X	X	X							
	Dissolved Oxygen	X	X	X	X	X	X						X	X	X	X							
	ORP	X	X	X	X	X	X						X	X	X	X							
	Temperature	X	X	X	X	X	X						X	X	X	X							
	Turbidity	X	X	X	X	X	X						X	X	X	X							
	Color	X	X	X	X	X	X						X	X	X	X							
Odor	X	X	X	X	X	X						X	X	X	X								

Notes: All samples are unfiltered (total).

X:\reports\40255h\40255561\2022 Nov_CO1_CCR.xlsj\Sheet1

Dan Milewsky

From: Blodgett, Meghan <mbloodgett@scsengineers.com>
Sent: Tuesday, December 13, 2022 3:30 PM
To: Dan Milewsky
Cc: Clark, Sherren; Kron, Nicole; Matzuk, Ryan
Subject: RE: Columbia, 40255561_coc

CAUTION: This email originated from outside Pace Analytical. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Thanks, Dan. 6010 is fine. Please add the following analytes:

MW-309: boron and calcium
MW-310: calcium and chloride

You'll see the field data shortly.

Meghan Blodgett
SCS Engineers
Madison, WI
608-345-9221 (C)
mbloodgett@scsengineers.com

www.scsengineers.com

-----Original Message-----

From: Dan Milewsky <Dan.Milewsky@pacelabs.com>
Sent: Tuesday, December 13, 2022 3:20 PM
To: Blodgett, Meghan <mbloodgett@scsengineers.com>
Cc: Clark, Sherren <SClark@scsengineers.com>; Kron, Nicole <NKron@scsengineers.com>; Matzuk, Ryan <RMatzuk@scsengineers.com>
Subject: RE: Columbia, 40255561_coc

May 15, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40261478

Dear Meghan Blodgett:

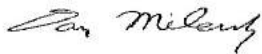
Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - 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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261478001	MW-309	Water	04/26/23 12:40	04/28/23 08:40
40261478002	MW-310	Water	04/26/23 11:30	04/28/23 08:40
40261478003	MW-311	Water	04/26/23 12:25	04/28/23 08:40
40261478004	FIELD BLANK MOD4	Water	04/26/23 13:00	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40261478001	MW-309	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261478002	MW-310	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261478003	MW-311	EPA 6020B	KXS	2
			LB	7
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3
40261478004	FIELD BLANK MOD4	EPA 6020B	KXS	2
		SM 2540C	HNT	1
		EPA 9040	SRK	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40261478

Sample: MW-309 **Lab ID: 40261478001** Collected: 04/26/23 12:40 Received: 04/28/23 08:40 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	50.8	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 23:35	7440-42-8	
Calcium	35500	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 23:35	7440-70-2	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.61	Std. Units			1		04/26/23 12:40		
Field Specific Conductance	2073.0	umhos/cm			1		04/26/23 12:40		
Oxygen, Dissolved	10.96	mg/L			1		04/26/23 12:40	7782-44-7	
REDOX	107.0	mV			1		04/26/23 12:40		
Turbidity	1.90	NTU			1		04/26/23 12:40		
Static Water Level	785.05	feet			1		04/26/23 12:40		
Temperature, Water (C)	10.8	deg C			1		04/26/23 12:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	1250	mg/L	20.0	8.7	1		05/01/23 10:53		
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		05/02/23 17:20		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	372	mg/L	40.0	8.6	20		05/15/23 12:46	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 00:43	16984-48-8	
Sulfate	143	mg/L	40.0	8.9	20		05/15/23 12:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

Sample: MW-310 **Lab ID: 40261478002** Collected: 04/26/23 11:30 Received: 04/28/23 08:40 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	57.5	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 23:42	7440-42-8	
Calcium	36800	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 23:42	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.27	Std. Units			1		04/26/23 11:30		
Field Specific Conductance	1040.0	umhos/cm			1		04/26/23 11:30		
Oxygen, Dissolved	11.38	mg/L			1		04/26/23 11:30	7782-44-7	
REDOX	112.6	mV			1		04/26/23 11:30		
Turbidity	2.25	NTU			1		04/26/23 11:30		
Static Water Level	785.18	feet			1		04/26/23 11:30		
Temperature, Water (C)	10.8	deg C			1		04/26/23 11:30		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	654	mg/L	20.0	8.7	1		05/01/23 10:53		
9040 pH		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		05/02/23 17:22		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	128	mg/L	40.0	8.6	20		05/15/23 13:00	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 00:57	16984-48-8	
Sulfate	102	mg/L	40.0	8.9	20		05/15/23 13:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40261478

Sample: MW-311 **Lab ID: 40261478003** Collected: 04/26/23 12:25 Received: 04/28/23 08:40 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	23.0	ug/L	10.0	3.0	1	05/02/23 05:28	05/11/23 00:19	7440-42-8	
Calcium	52800	ug/L	254	76.2	1	05/02/23 05:28	05/11/23 00:19	7440-70-2	
Field Data		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	7.48	Std. Units			1		04/26/23 12:25		
Field Specific Conductance	484.7	umhos/cm			1		04/26/23 12:25		
Oxygen, Dissolved	10.58	mg/L			1		04/26/23 12:25	7782-44-7	
REDOX	118.4	mV			1		04/26/23 12:25		
Turbidity	0.39	NTU			1		04/26/23 12:25		
Static Water Level	785.69	feet			1		04/26/23 12:25		
Temperature, Water (C)	9.8	deg C			1		04/26/23 12:25		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	292	mg/L	20.0	8.7	1		05/01/23 10:53		
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		05/02/23 17:23		H6
300.0 IC Anions		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	2.1	mg/L	2.0	0.43	1		05/12/23 01:12	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 01:12	16984-48-8	
Sulfate	22.2	mg/L	2.0	0.44	1		05/12/23 01:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

Sample: FIELD BLANK MOD4 **Lab ID: 40261478004** Collected: 04/26/23 13:00 Received: 04/28/23 08:40 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	05/02/23 05:28	05/10/23 19:55	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 19:55	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		05/01/23 10:53		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.3	Std. Units	0.10	0.010	1		05/02/23 17:36		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		05/12/23 01:26	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 01:26	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		05/12/23 01:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

QC Batch: 443772	Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A	Analysis Description: 6020B MET
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

METHOD BLANK: 2547952 Matrix: Water
Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	05/10/23 19:11	
Calcium	ug/L	<76.2	254	05/10/23 19:11	

LABORATORY CONTROL SAMPLE: 2547953

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	225	90	80-120	
Calcium	ug/L	10000	9600	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547954 2547955

Parameter	Units	40261411001		2547955		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Boron	ug/L	32.0	250	250	249	87	85	75-125	2	20	
Calcium	ug/L	91800	10000	10000	104000	124	132	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

QC Batch:	443675	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

METHOD BLANK: 2547666 Matrix: Water
Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

QC Batch:	444529	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: 40261478001, 40261478002, 40261478003, 40261478004

METHOD BLANK: 2551731 Matrix: Water
Associated Lab Samples: 40261478001, 40261478002, 40261478003, 40261478004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/11/23 21:07	
Fluoride	mg/L	<0.095	0.32	05/11/23 21:07	
Sulfate	mg/L	<0.44	2.0	05/11/23 21:07	

LABORATORY CONTROL SAMPLE: 2551732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.2	101	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	20.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2551733 2551734

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261465015 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	27.1J	400	400	433	429	101	101	90-110	1	15		
Fluoride	mg/L	<1.9	40	40	42.5	41.8	106	105	90-110	1	15		
Sulfate	mg/L	969	2000	2000	2860	2800	94	92	90-110	2	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2551735 2551736

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261749002 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	21.4	20	20	42.5	42.6	105	106	90-110	0	15		
Fluoride	mg/L	0.16J	2	2	2.4	2.4	110	111	90-110	0	15 M0		
Sulfate	mg/L	29.2	20	20	50.3	50.4	105	106	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 COLUMBIA CCR MOD 4-6

Pace Project No.: 40261478

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR MOD 4-6
Pace Project No.: 40261478

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261478001	MW-309	EPA 3010A	443772	EPA 6020B	443833
40261478002	MW-310	EPA 3010A	443772	EPA 6020B	443833
40261478003	MW-311	EPA 3010A	443772	EPA 6020B	443833
40261478004	FIELD BLANK MOD4	EPA 3010A	443772	EPA 6020B	443833
40261478001	MW-309				
40261478002	MW-310				
40261478003	MW-311				
40261478001	MW-309	SM 2540C	443675		
40261478002	MW-310	SM 2540C	443675		
40261478003	MW-311	SM 2540C	443675		
40261478004	FIELD BLANK MOD4	SM 2540C	443675		
40261478001	MW-309	EPA 9040	443847		
40261478002	MW-310	EPA 9040	443847		
40261478003	MW-311	EPA 9040	443847		
40261478004	FIELD BLANK MOD4	EPA 9040	443847		
40261478001	MW-309	EPA 300.0	444529		
40261478002	MW-310	EPA 300.0	444529		
40261478003	MW-311	EPA 300.0	444529		
40261478004	FIELD BLANK MOD4	EPA 300.0	444529		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

46261478

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/hubs/pas-standard-terms.pdf>.

Section A Required Client Information:			Section B Required Project Information:			Section C Invoice Information:			Regulatory Agency	
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			Project Name: 25223067 Columbia CCR Mod 4-6			Pace Project Manager: dan.milewski@pacelabs.com			State / Location	
Requested Due Date:			Project #: 25223067			Pace Profile #:			WI	

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9, /, -) Sample Ids must be unique	MATRIX Drinking Water Water Waste Water Product Soil/Solid Oil Wipe Air Other Tissue	CODE DW WT WW P SL OL WR AR OT TS	COLLECTED				SAMPLE TEMP AT COLLECTION	PRESERVATIVES							ANALYSES TEST	REQUESTED ANALYSIS FILTERED (Y/N)												RESIDUAL CHANGES (Y/N)					
				START		END			# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2SO3		Methanol	Other	Metals (B/Ca)	Chloride/Fluoride/Sulfate	TDS and pH													
				DATE	TIME	DATE	TIME																											
1		WT																																
2	MW-309	WT		4/26	1240					X	X	X	X	X	X	X	X											001						
3	MW-310	WT		4/26	1150					X	X	X	X	X	X	X	X											002						
4	MW-311	WT		4/26	1225					X	X	X	X	X	X	X	X											003						
5	FIELD BLANK MOD4	WT		4/26	1300					X	X	X	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	SAMPLE CONDITIONS		
ALL SAMPLES UNFILTERED	Bridget Russell	4/27	1600						
	COLOGIST INC	4/26/23	0840	Gregg	4/28/23	0840	0	Y	Y

SAMPLER NAME AND SIGNATURE		TEMP In C Received on Ice (Y/N) Custody Sealed Cooler (Y/N) Samples intact (Y/N)
PRINT Name of SAMPLER:	Bridget Russell	
SIGNATURE of SAMPLER:	<i>Bridget Russell</i>	
DATE Signed: 4/27/2023		

Effective Date: 8/16/2022

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # 40261478

All containers needing preservation have been checked and noted below:

Yes No N/A

Initial when completed SG Date/Time:

Lab Lot# of pH paper: 1000700

Lab Std #ID of preservation (if pH adjusted)

Pace Lab #	Glass					Plastic					Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)			
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U								WGFU	WPFU	SP5T
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
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

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	

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SLS Engineers

WO#: **40261478**

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



40261478

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 - 9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 / Corr: 2.0

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: 4/28/23 / Initials: SE
 Labeled By Initials: mt

Chain of Custody Present: <u>4/28/23</u> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. <u>PM provided</u>
Chain of Custody Filled Out: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt <input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time.
Short Hold Time Analysis (<72hr): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> Pace IR, Non-Pace	
Containers Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W</u>	
Trip Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 log in

May 26, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

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

Revised Report: REDOX has been added to the field data list for MW-84A.

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261460001	MW-301	Water	04/27/23 12:20	04/28/23 08:40
40261460002	MW-84A	Water	04/27/23 14:05	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40261460001	MW-301	EPA 6020B	TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40261460002	MW-84A	EPA 6020B	TXW
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	SRK			1	PASI-G
EPA 300.0	HMB			3	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:01	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:01	7440-38-2	
Barium	9.8	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:01	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:01	7440-41-7	
Boron	20.1	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:01	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:01	7440-43-9	
Calcium	120000	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:01	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:01	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:01	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:01	7439-92-1	
Lithium	0.62J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:01	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:01	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:01	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:01	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:00	7439-97-6	M0
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.65	Std. Units			1		04/27/23 12:20		
Field Specific Conductance	857.0	umhos/cm			1		04/27/23 12:20		
Oxygen, Dissolved	6.50	mg/L			1		04/27/23 12:20	7782-44-7	
REDOX	95.3	mV			1		04/27/23 12:20		
Turbidity	0.00	NTU			1		04/27/23 12:20		
Static Water Level	787.57	feet			1		04/27/23 12:20		
Temperature, Water (C)	8.0	deg C			1		04/27/23 12:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	526	mg/L	20.0	8.7	1		05/01/23 10:51		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.9	Std. Units	0.10	0.010	1		05/02/23 16:48		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.5J	mg/L	2.0	0.43	1		05/12/23 16:00	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:00	16984-48-8	
Sulfate	12.3	mg/L	2.0	0.44	1		05/12/23 16:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-84A **Lab ID: 40261460002** Collected: 04/27/23 14:05 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:08	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:08	7440-38-2	
Barium	12.6	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:08	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:08	7440-41-7	
Boron	10.3	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:08	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:08	7440-43-9	
Calcium	68600	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:08	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:08	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:08	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:08	7439-92-1	
Lithium	0.71J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:08	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:08	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:08	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:08	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:12	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.01	Std. Units			1		04/27/23 14:05		
Field Specific Conductance	556.6	umhos/cm			1		04/27/23 14:05		
Field Oxidation Potential	103.4	mV			1		04/27/23 14:05		
Oxygen, Dissolved	9.37	mg/L			1		04/27/23 14:05	7782-44-7	
Turbidity	0.72	NTU			1		04/27/23 14:05		
Static Water Level	786.97	feet			1		04/27/23 14:05		
Temperature, Water (C)	10.7	deg C			1		04/27/23 14:05		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	326	mg/L	20.0	8.7	1		05/01/23 10:51		
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		05/02/23 16:52		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.0	mg/L	2.0	0.43	1		05/12/23 16:59	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:59	16984-48-8	
Sulfate	1.3J	mg/L	2.0	0.44	1		05/12/23 16:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 444256

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2550653

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/09/23 08:56	

LABORATORY CONTROL SAMPLE: 2550654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550655 2550656

Parameter	Units	40261460001		2550655		2550656		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Mercury	ug/L	<0.066	5	5	5.8	5.9	115	119	85-115	3	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443628

Analysis Method: EPA 6020B

QC Batch Method: EPA 3010A

Analysis Description: 6020B MET

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547530

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/11/23 17:42	
Arsenic	ug/L	<0.28	1.0	05/11/23 17:42	
Barium	ug/L	<0.70	2.3	05/11/23 17:42	
Beryllium	ug/L	<0.25	1.0	05/11/23 17:42	
Boron	ug/L	<3.0	10.0	05/11/23 17:42	
Cadmium	ug/L	<0.15	1.0	05/11/23 17:42	
Calcium	ug/L	<76.2	254	05/11/23 17:42	
Chromium	ug/L	<1.0	3.4	05/11/23 17:42	
Cobalt	ug/L	<0.12	1.0	05/11/23 17:42	
Lead	ug/L	<0.24	1.0	05/11/23 17:42	
Lithium	ug/L	<0.22	1.0	05/11/23 17:42	
Molybdenum	ug/L	<0.44	1.5	05/11/23 17:42	
Selenium	ug/L	<0.32	1.1	05/11/23 17:42	
Thallium	ug/L	<0.14	1.0	05/11/23 17:42	

LABORATORY CONTROL SAMPLE: 2547531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	250	100	80-120	
Arsenic	ug/L	250	255	102	80-120	
Barium	ug/L	250	234	94	80-120	
Beryllium	ug/L	250	233	93	80-120	
Boron	ug/L	250	220	88	80-120	
Cadmium	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	241	96	80-120	
Cobalt	ug/L	250	241	96	80-120	
Lead	ug/L	250	241	96	80-120	
Lithium	ug/L	250	237	95	80-120	
Molybdenum	ug/L	250	245	98	80-120	
Selenium	ug/L	250	257	103	80-120	
Thallium	ug/L	250	227	91	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Parameter	Units	2547532		2547533		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	0.52J	250	250	268	263	107	105	75-125	2	20		
Arsenic	ug/L	12.4	250	250	264	262	100	100	75-125	1	20		
Barium	ug/L	128	250	250	405	384	111	102	75-125	5	20		
Beryllium	ug/L	0.83J	250	250	261	259	104	103	75-125	1	20		
Boron	ug/L	43.8	250	250	309	302	106	103	75-125	2	20		
Cadmium	ug/L	0.56J	250	250	249	243	99	97	75-125	3	20		
Calcium	ug/L	147000	10000	10000	163000	156000	157	94	75-125	4	20	P6	
Chromium	ug/L	30.1	250	250	279	274	100	98	75-125	2	20		
Cobalt	ug/L	19.2	250	250	257	254	95	94	75-125	1	20		
Lead	ug/L	26.6	250	250	280	274	102	99	75-125	2	20		
Lithium	ug/L	23.9	250	250	277	276	101	101	75-125	0	20		
Molybdenum	ug/L	1.3J	250	250	246	241	98	96	75-125	2	20		
Selenium	ug/L	1.9J	250	250	267	264	106	105	75-125	1	20		
Thallium	ug/L	0.44J	250	250	250	251	100	100	75-125	0	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443675

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547666

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

QC Batch: 444310	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: 40261460001, 40261460002

METHOD BLANK: 2550800 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/12/23 14:40	
Fluoride	mg/L	<0.095	0.32	05/12/23 14:40	
Sulfate	mg/L	<0.44	2.0	05/12/23 14:40	

LABORATORY CONTROL SAMPLE: 2550801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550802 2550803

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261459001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	2.3	20	20	22.6	22.7	102	102	90-110	0	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	105	104	90-110	0	15		
Sulfate	mg/L	11.0	20	20	31.5	31.5	103	103	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.387 (0.805) C:NA T:99%	pCi/L	05/18/23 14:53	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.417 ± 0.322 (0.623) C:80% T:87%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.417 ± 0.709 (1.43)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-84A **Lab ID: 40261460002** Collected: 04/27/23 14:05 Received: 04/28/23 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.365 (0.772) C:NA T:95%	pCi/L	05/18/23 15:08	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.326 ± 0.316 (0.647) C:79% T:93%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.326 ± 0.681 (1.42)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585758

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: 40261460001, 40261460002

METHOD BLANK: 2845167

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.356 ± 0.319 (0.642) C:76% T:89%	pCi/L	05/15/23 15:19	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585757

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: 40261460001, 40261460002

METHOD BLANK: 2845166

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0428 ± 0.195 (0.397) C:NA T:94%	pCi/L	05/18/23 14:53	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

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

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261460001	MW-301	EPA 3010A	443628	EPA 6020B	443733
40261460002	MW-84A	EPA 3010A	443628	EPA 6020B	443733
40261460001	MW-301	EPA 7470	444256	EPA 7470	444285
40261460002	MW-84A	EPA 7470	444256	EPA 7470	444285
40261460001	MW-301				
40261460002	MW-84A				
40261460001	MW-301	EPA 903.1	585757		
40261460002	MW-84A	EPA 903.1	585757		
40261460001	MW-301	EPA 904.0	585758		
40261460002	MW-84A	EPA 904.0	585758		
40261460001	MW-301	Total Radium Calculation	589747		
40261460002	MW-84A	Total Radium Calculation	589747		
40261460001	MW-301	SM 2540C	443675		
40261460002	MW-84A	SM 2540C	443675		
40261460001	MW-301	EPA 9040	443847		
40261460002	MW-84A	EPA 9040	443847		
40261460001	MW-301	EPA 300.0	444310		
40261460002	MW-84A	EPA 300.0	444310		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Page

CHAIN-OF-CUSTODY / Analytical Request Document

40261460

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

Section A Subscribing a sample via this chain of custody constitutes acknowledgment and acceptance of the Page Terms and Conditions found at <https://info.pacelabs.com/hubs/pas-standard-lams.pdf>

Page : 1 Of 1

Required Client Information:
 Company: SCS ENGINEERS
 Address: 2830 Dairy Drive
 Madison, WI 53719
 Email: mlhody@scsengineers.com
 Phone: 608-216-7382 Fax: _____
 Requested Due Date: _____

Required Project Information:
 Report To: Meghan Blodgett
 Copy To: _____
 Purchase Order #: _____
 Project Name: 25223067 Columbia CCR Background
 Project #: 25223067

Inventory Information:
 Attention: _____
 Company Name: _____
 Address: _____
 Pass Guide: _____
 Pass Project Manager: dan.milwsky@pacelabs.com
 Pass Profile #: _____

Regulatory Agency: _____
 State / Location: _____
 Requested Analysis Filtered (Y/N): _____

ITEM #	SAMPLE ID One Character per box. (A-Z, 0-9 /, -) Sample IDs must be unique	MATRIX	CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	Preservatives								Analyses Test				Residual Chlorine (Y/N)			
				START DATE	END DATE		npreserved	2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Radium 226	Radium 228	Metals	TDS and pH		Chloride, Fluoride, Sulfate		
1	MM-301	Drinking Water	DW	4/27/2020			X	X	X	X	X	X	X	X	X	X	X	X	X	X		001
2	MM-84A	Waste Water	WW	4/27/2020			X	X	X	X	X	X	X	X	X	X	X	X	X	X		002
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS: _____

RELINQUISHED BY / AFFILIATION: Budget Russell
 CS Engineers 4/27/2020 1600
 SCS Engineers 4/27/2020 0840

ACCEPTED BY / AFFILIATION: _____

DATE: _____ TIME: _____

TEMP in C: _____

Received on Ice (Y/N): Y

Custody Sealed Cooler (Y/N): Y

Samples Intact (Y/N): Y

SAMPLER NAME AND SIGNATURE: Budget Russell

PRINT Name of SAMPLER: Budget Russell

SIGNATURE of SAMPLER: Budget Russell

DATE Signed: 4/27/2023

Client Name: SCS Engineers Sample Preservation Receipt Form
 Project # 40261460
 All containers needing preservation have been checked and noted below: Yes No N/A
 Lab Lot# of pH paper: 1000722 Lab Std #/ID of preservation (if pH adjusted):

Initial when completed: SG Date/ Time:

Pace Lab #	Glass						Plastic						Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)				
	AG1U	BG1U	AG1H	AG4S	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
001																																		
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

Handwritten: 4/28/23 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	1L poly HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SLS Engineers

WO#: **40261460**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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 - 9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 / Corr: 2.0

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

Person examining contents:
 Date: 4/28/23 Initials: SG
 Labeled By Initials: mt

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

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> , Pace IR, Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>002 same "1045"</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>		<u>4/28/23 SG</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: chart used white out on bottle types 4/28/23 SG



July 18, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 WPL-COLUMBIA
Pace Project No.: 40264572

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on July 01, 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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CERTIFICATIONS

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE SUMMARY

Project: 25223067 WPL-COLUMBIA
Pace Project No.: 40264572

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40264572001	MW-309	Water	06/29/23 14:10	07/01/23 09:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25223067 WPL-COLUMBIA
Pace Project No.: 40264572

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40264572001	MW-309	EPA 6020B	TXW	1
			AG1	7
		EPA 300.0	HMB	1

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SUMMARY OF DETECTION

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

Lab Sample ID	Client Sample ID					
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40264572001	MW-309					
EPA 6020B	Boron	59.4	ug/L	10.0	07/07/23 10:10	
	Field pH	7.72	Std. Units		06/29/23 14:10	
	Field Specific Conductance	3282	umhos/cm		06/29/23 14:10	
	Oxygen, Dissolved	9.22	mg/L		06/29/23 14:10	
	REDOX	217.1	mV		06/29/23 14:10	
	Turbidity	0.00	NTU		06/29/23 14:10	
	Static Water Level	784.12	feet		06/29/23 14:10	
	Temperature, Water (C)	13.9	deg C		06/29/23 14:10	
EPA 300.0	Sulfate	147	mg/L	10.0	07/13/23 11:49	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

Sample: MW-309 **Lab ID: 40264572001** Collected: 06/29/23 14:10 Received: 07/01/23 09:00 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	59.4	ug/L	10.0	3.0	1	07/05/23 06:10	07/07/23 10:10	7440-42-8	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.72	Std. Units			1		06/29/23 14:10		
Field Specific Conductance	3282	umhos/cm			1		06/29/23 14:10		
Oxygen, Dissolved	9.22	mg/L			1		06/29/23 14:10	7782-44-7	
REDOX	217.1	mV			1		06/29/23 14:10		
Turbidity	0.00	NTU			1		06/29/23 14:10		
Static Water Level	784.12	feet			1		06/29/23 14:10		
Temperature, Water (C)	13.9	deg C			1		06/29/23 14:10		
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Sulfate	147	mg/L	10.0	2.2	5		07/13/23 11:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

QC Batch: 448951

Analysis Method: EPA 6020B

QC Batch Method: EPA 3010A

Analysis Description: 6020B MET

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40264572001

METHOD BLANK: 2578857

Matrix: Water

Associated Lab Samples: 40264572001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	07/07/23 08:32	

LABORATORY CONTROL SAMPLE: 2578858

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	269	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2578859 2578860

Parameter	Units	40264526004		2578859		2578860		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Boron	ug/L	0.051 mg/L	250	250	328	337	111	114	75-125	3	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

QC Batch:	449570	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: 40264572001

METHOD BLANK: 2582475 Matrix: Water

Associated Lab Samples: 40264572001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<0.44	2.0	07/13/23 11:04	

LABORATORY CONTROL SAMPLE: 2582476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	20	20.3	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2582477 2582478

Parameter	Units	40264572001		2582477		2582478		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Sulfate	mg/L	147	100	100	100	241	241	94	94	90-110	0	15

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2582479 2582480

Parameter	Units	40264768001		2582479		2582480		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					
Sulfate	mg/L	138	400	400	400	517	541	95	101	90-110	5	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALIFIERS

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 WPL-COLUMBIA

Pace Project No.: 40264572

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40264572001	MW-309	EPA 3010A	448951	EPA 6020B	449017
40264572001	MW-309				
40264572001	MW-309	EPA 300.0	449570		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40264572

Company: SLS Engineers Billing Information: 25223067

Address: 2530 Deiny Dr, Madison WI 53718

Report To: Meghan Blodgett Email To: mblodgett@escsensors.com

Copy To: _____ Site Collection Info/Address: WPL - Columbia

Container Preservative Type **

Lab Project Manager: _____

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

Customer Project Name/Number: _____ State: _____ County/City: _____ Time Zone Collected: _____

Phone: 414-897-4253 Site/Facility ID #: _____ Compliance Monitoring? Yes No

Email: eschaefer@escsensors.com

Collected By (print): Brian Schaefer Purchase Order #: _____ DW PWS ID #: _____

Collected By (signature): _____ Turnaround Date Required: _____ DW Location Code: _____

Sample Disposal: _____ Rush: _____ Field Filtered (if applicable): _____

Dispose as appropriate Return Archive _____ Hold: _____

[] 2 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply)

Analysis: _____

Analyses										Lab Profile/Line:
										Lab Sample Receipt Check List:
										Custody Seals Present/Intact <u>Y N NA</u>
										Custody Signatures Present <u>Y N NA</u>
										Collector Signatures Present <u>Y N NA</u>
										Bottles Intact <u>Y N NA</u>
										Correct Bottles <u>Y N NA</u>
										Sufficient Volume <u>Y N NA</u>
										Samples Received on Ice <u>Y N NA</u>
										VOA - Headspace Acceptable <u>Y N NA</u>
										USDA Regulated Soils <u>Y N NA</u>
										Samples in Holding Time <u>Y N NA</u>
										Residual Chlorine Present <u>Y N NA</u>
										Cl Strips: _____
										Sample pH Acceptable <u>Y N NA</u>
										pH Strips: _____
										Sulfide Present <u>Y N NA</u>
										Lead Acetate Strips: _____

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res CI	# of Ctns
			Date	Time	Date	Time		
MW-309	GW	G	6/29	1410			2	X X

LAB USE ONLY:

Lab Sample # / Comments: 001

Customer Remarks / Special Conditions / Possible Hazards: _____

Type of Ice Used: Wet Blue Dry None

Packing Material Used: (C)

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

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

Lab Tracking #: 2839170

Samples received via: FEDEX UPS Client Courier Pace Courier

MTJL LAB USE ONLY

Relinquished by/Company: (Signature) SLS Date/Time: 6/30/23 1430

Relinquished by/Company: (Signature) CS Logistics Date/Time: 7-1-23 0900

Relinquished by/Company: (Signature) _____ Date/Time: _____

Received by/Company: (Signature) _____ Date/Time: _____

Received by/Company: (Signature) Rodman Pace Date/Time: 7-1-23 0900

Received by/Company: (Signature) _____ Date/Time: _____

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: _____

Cooler 1 Temp Upon Receipt: _____ °C

Cooler 1 Therm Corr. Factor: _____ °C

Cooler 1 Corrected Temp: _____ °C

Comments: _____

Temp Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: 11 of 13 of: _____

Effective Date: 8/16/2022

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # 40264572

All containers needing preservation have been checked and noted below

Lab Lot# of pH paper: 1005123

Yes No N/A
Lab Std #/ID of preservation (if pH adjusted):

Initial when completed: R. A. Date/ Time:

Pace Lab #	Glass			Plastic					Vials					Jars			General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)												
	AG1U	BG1U	AG1H	AG4S	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			
001																																				X	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

RA 7-1-23

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	

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS Engineers
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Project #: _____
WO# : 40264572

 40264572


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-121 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 3.0 / ICorr: 2.5
 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: 8-23-23 / Initials: RA
 Labeled By Initials: SC

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



Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Columbia

Location ID: MW-84A		Number of Sampling Dates: 24																							
Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023
Boron	ug/L	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1	13.6	12	15.7	10	9.7	14.3	11.1	10.5	12.2	10.3
Calcium	mg/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700	77600	69200	69100	75300	75100	78400	68600
Chloride	mg/L	4.9	4.7	5.1	--	4.3	4.7	4.6	4.9	5.5	5.5	5.1	4.8	4.9	4.2	3.6	3.9	3.7	3.7	4.3	4.4	3.5	5.2	3.4	3
Fluoride	mg/L	<0.2	<0.2	<0.2	--	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	7.6	7.61	7.45	7.34	7.91	7.25	6.99	7.8	7.28	7.23	7.68	7.45	7.38	7.24	7.03	7.23	7.51	7.34	7.49	7.34	7.42	7.34	7.31	7.01
Sulfate	mg/L	4.9	4.3	3.7	--	2.6	2.7	3	2.8	2.7	2	2.2	2.8	1.9	1.6	1.4	1.3	<2.2	1.5	1.3	1.4	1.3	1.4	1.1	1.3
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316	340	320	328	326	334	302	326
Antimony	ug/L	<0.073	0.084	0.1	--	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.55	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.15	0.29	0.14	--	0.35	0.19	0.35	<0.099	<0.28	0.28	--	<0.28	<0.28	0.33	<0.28	0.46	0.38	0.34	0.49	0.91	0.41	0.31	0.72	<0.28
Barium	ug/L	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2	14	13.9	12.6	13.4	12.9	13.5	13.7	12.6
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	--	<0.25	<0.25	0.47	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.53	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	2.5	1.9	1.8	--	2	2	1.9	2.4	2	1.6	--	2.4	1.5	1.6	1.8	1.6	1.6	1.7	1.6	2.6	1.9	2.2	2.2	1.7
Cobalt	ug/L	0.095	<0.036	0.053	--	<0.036	<0.036	<0.036	<0.036	<0.085	<0.085	--	<0.085	<0.085	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.52	0.12	<0.12	<0.12	<0.12
Lead	ug/L	0.16	<0.04	0.39	--	0.049	0.11	<0.04	0.041	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	--	<0.24	<0.24	0.55	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.72	0.44	0.5	--	0.56	0.56	0.56	0.55	0.46	0.58	--	0.5	0.4	0.49	0.56	0.52	0.58	0.4	0.39	1	0.28	0.36	0.41	0.71
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.07	<0.07	0.073	--	0.12	<0.07	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	0.62	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.48	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.66	0.19	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247	0.1	0.395	0.39	0.285	0.243	0.611	0.673	0.326
Radium-226	pCi/L	0.156	-0.088	--	-0.058	0.132	0.168	0.624	0.0768	0.27	0.242	--	0.155	-0.203	0.313	0.199	0.247	0.1	0.368	0	-0.289	0	0.254	0.267	0
Radium-228	pCi/L	0.437	0.0809	--	1.37	0.693	0.236	0.766	0.0161	0.406	0.267	--	0.371	0.529	0.307	0.482	-0.024	-0.153	0.0273	0.39	0.285	0.243	0.357	0.406	0.326
Field Specific Conductance	umhos/cm	599	427	574.8	579.3	1002	578.2	489	948	535.3	557.2	491	581.7	617.1	609	637.2	614.1	618.4	613.7	610.1	610.9	598.9	600.2	585.2	556.6
Oxygen, Dissolved	mg/L	9.7	9.37	3.78	5.11	9.61	8.94	6.48	9.28	9.46	7.5	9.3	3.94	8.84	10.01	9.49	11.36	8.43	9.81	9.39	9.8	9.25	9.33	8.31	9.37
Field Oxidation Potential	mV	154	165.1	139.9	138.3	82.7	87	192.9	102	123.6	204.7	210	53.3	142.7	71.5	103.4	181.7	121.5	135	153.2	95.6	89.7	200.6	39.9	103.4
Groundwater Elevation	feet	785.31	786.3	785.89	785.61	787.22	786.63	786.7	787.16	787.63	786.68	785.32	785.88	786.55	788.32	787.35	787.79	786.5	787.02	786.1	785.84	784.96	785.02	784.57	786.97
Temperature	deg C	10.4	10.2	11.3	11	11.5	10.8	10.9	10.6	11.3	11.2	11.1	10.2	12	11.6	10.2	11.8	10.3	10.6	11.9	10.2	12.5	9.9	11.7	10.7
Turbidity	NTU	--	0.86	2.75	0.17	0.3	0.25	0.33	0.04	0.56	0.08	2.93	0.81	0.71	3.79	1.9	2.41	1.23	2.15	0	2.45	3.41	0	0	0.72
pH at 25 Degrees C	Std. Units	7.5	7.4	7.4	--	7.3	7.4	7.3	7.7	7.6	7.4	7.6	7.6	7.4	7.5	7.4	7.5	7.4	7.6	7.6	7.6	7.8	7.6	7.4	7.6

Single Location

Name: WPL - Columbia

Location ID: MW-301																								
Number of Sampling Dates: 23																								
Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023
Boron	ug/L	26.5	25.2	23.6	30.6	32.8	32.6	28.8	21.3	30.6	34.3	24.3	22.8	27.8	26.9	35.9	27.9	21.3	28.8	22.2	31.4	28.7	37.5	20.1
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000	93000	117000	67800	97300	62800	120000
Chloride	mg/L	3.7	4	3.5	2.2	2	1.5	2	3.5	5.5	4	2.3	5.2	3.2	0.79	1.7	1.3	2	3.4	1.5	2.7	1.9	2.3	1.5
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	6.85	7.01	6.87	7.28	6.63	7.1	7.11	6.7	6.75	7.37	6.76	6.91	6.79	6.62	6.67	6.89	6.73	6.95	6.66	7.01	6.6	6.8	6.65
Sulfate	mg/L	9.3	15.3	15	13.9	12.3	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5	25.1	8.5	17.4	12.7	11.6	12.3
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452	412	472	334	422	282	526
Antimony	ug/L	0.15	0.094	0.13	<0.073	0.4	<0.073	<0.073	<0.15	<0.15	--	<0.15	0.36	<0.15	0.32	<0.15	--	<0.15	0.33	<0.15	<0.15	0.31	<0.15	<0.15
Arsenic	ug/L	0.26	0.26	0.19	0.24	0.4	0.13	0.18	<0.28	<0.28	--	<0.28	0.45	<0.28	0.4	0.42	<0.28	0.33	0.62	<0.28	0.35	0.47	0.3	<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	9.8	9.4	8.9	7.7	7.8	7.5	9.8
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.19	<0.13	<0.13	<0.18	<0.18	--	<0.18	0.37	<0.18	0.28	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	0.32	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	0.21	<0.15	--	<0.15	0.19	<0.15	<0.15	0.3	<0.15	<0.15
Chromium	ug/L	2.1	0.58	0.59	<0.39	0.7	0.53	0.7	2.3	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	1.4	0.25	0.22	0.041	0.38	0.071	0.064	0.13	0.12	--	<0.085	0.28	<0.12	0.35	<0.12	0.17	<0.12	0.29	<0.12	0.34	0.32	0.52	<0.12
Lead	ug/L	0.9	0.077	0.48	<0.04	0.34	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	0.3	<0.24	--	<0.24	0.25	<0.24	<0.24	3.1	<0.24	<0.24
Lithium	ug/L	1.3	0.58	0.69	0.6	0.87	0.67	0.68	0.62	0.6	--	0.55	0.85	0.52	0.9	0.61	0.67	0.47	0.46	0.58	0.46	0.56	0.37	0.62
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066
Molybdenum	ug/L	0.35	0.15	0.14	0.12	0.38	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	0.3	0.21	0.39	<0.21	0.26	<0.21	<0.21	<0.32	<0.32	--	<0.32	0.71	<0.32	0.49	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.48	<0.14	<0.14	<0.14	<0.14	--	<0.14	0.3	<0.14	0.48	<0.14	<0.14	<0.14	0.3	<0.14	0.17	0.32	<0.14	<0.14
Total Radium	pCi/L	1.31	1.11	0.89	0.631	1.01	2.42	1.35	1.3	1.74	--	0.882	0.0351	0.652	0.552	0.701	0.502	0.193	0.38	1.16	0.172	0.179	0.00292	0.417
Radium-226	pCi/L	0.655	0.294	0.404	-0.067	0.108	1.46	0.513	0.287	1.09	--	0.122	-0.06	0.247	0	0.252	0.136	0	0.0511	0.418	0.172	0	-0.169	0
Radium-228	pCi/L	0.651	0.82	0.486	0.631	0.905	0.964	0.833	1.01	0.647	--	0.76	0.0351	0.405	0.552	0.449	0.366	0.193	0.329	0.739	-0.0327	0.179	0.00292	0.417
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797	760	857	597.2	747	507.5	857
Oxygen, Dissolved	mg/L	1.7	2.71	1.47	1.99	1.34	1.24	1.44	1.81	1.43	1.1	2.35	2.14	2.49	2.2	1.67	1.07	2	1.22	3.9	0.25	2.47	0.1	6.5
Field Oxidation Potential	mV	135	123.7	133.9	100.8	95.8	226.1	100.9	115.1	187.4	204	74.3	126.5	77.9	152.1	173	132.3	118.7	183.9	102.9	57.8	207.5	80.9	95.3
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	787.77	786.53	786.5	785.28	785.44	784.91	787.57
Temperature	deg C	9.7	7.7	10	11.2	10.1	8.8	7.7	8.9	10.2	11.1	7.4	10.6	11.1	7.5	11.3	8.5	8.1	11	7.4	11.1	7.1	10.8	8
Turbidity	NTU	--	1.52	3.89	0.59	0.74	0.42	0.1	0.22	0.18	1.52	1.12	0.46	3.3	2.02	2.12	1.41	0	0	2.41	3.21	0	0	0
pH at 25 Degrees C	Std. Units	7	7	6.8	6.8	6.9	6.9	7.1	7	7	7.3	7	7	7.1	6.8	7	6.8	7	7.2	6.9	7.3	7	7.1	6.9

Single Location

Name: WPL - Columbia

Location ID: MW-309		Number of Sampling Dates: 25																								
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	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
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	48	49.9	42.9	36.4	32.5	46.6	49.3	50.8	59.4
Calcium	ug/L	42700	41800	39600	52700	67600	63800	93600	55200	--	45300	46900	51600	--	--	65300	--	62300	--	83100	--	80200	162000	153000	35500	--
Chloride	mg/L	147	157	157	141	203	557	811	329	--	145	43.2	350	--	--	575	--	390	--	519	--	319	796	--	372	--
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	--	<0.095	--	<0.095	--	<0.095	<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	7.68	7.71	7.64	7.45	7.64	7.23	7.3	7.61	7.72
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	--	30.3	--	27.7	--	17.9	28.9	--	143	147
Total Dissolved Solids	mg/L	576	552	562	478	548	1210	1570	830	--	548	370	960	--	--	1160	--	916	--	1110	--	764	1670	--	1250	--
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	1804	3072	2079	1382	1420	2591	2746	2073	3282
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	10.14	11.21	9.27	9.33	7.66	8.49	8.97	10.96	9.22
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	124.1	67.2	85.8	142.9	111.7	41	155.5	107	217.1
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	784.29	784.2	783.65	782.93	783.14	781.5	781.62	785.05	784.12
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	11.8	10.7	13.3	13.2	11.17	11.5	12.9	7.7	10.8	13.9	
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	2.8	0.1	9.06	2.67	7.83	1.81	0.31	1.9	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	--	7.7	--	7.8	--	7.6	7.5	--	7.9	--

Single Location


Name: WPL - Columbia

Location ID: MW-310		Number of Sampling Dates: 24																							
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	4/13/2021	6/11/2021	10/14/2021	4/12/2022	10/26/2022	11/30/2022	4/26/2023	8/31/2023
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	--	69.6	--	72	72	71.3	--	57.5	--
Calcium	ug/L	32400	33400	32100	32100	34300	39700	38800	54100	--	38800	--	57600	55400	41100	62000	56800	49300	--	38900	31900	68900	55500	36800	--
Chloride	mg/L	19.8	21.7	22.1	68.6	59.8	118	139	152	--	76	--	190	--	128	310	227	227	220	84.6	35.2	323	215	128	--
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	<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	7.73	7.73	7.7	7.74	7.61	7.67	7.27	7.75
Sulfate	mg/L	31.6	33.1	32	28	30.4	60.2	32.8	118	--	58.4	--	85.9	--	68.2	60	--	43.3	--	54.3	39.8	32.8	--	102	--
Total Dissolved Solids	mg/L	406	398	396	436	438	532	526	736	--	470	--	650	--	582	846	700	654	--	498	416	750	--	654	--
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	1194	1192	884	711	1	1200	1040	1064
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	9.93	11.21	9.29	10.03	8.66	9.46	11.38	11.24
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	106	55.6	85.2	200.5	31.3	146.5	112.6	184.6
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	784.24	784.05	783.48	783.19	780.96	781.14	785.18	782.47
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	10.8	12.8	13.4	10.6	13	10.8	10.8	13.4
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	0.57	0.67	3.16	1.17	1.58	0.51	2.25	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	--	7.8	--	8	7.9	7.7	--	7.8	--

Single Location

Name: WPL - Columbia

Location ID: MW-311																			
Number of Sampling Dates: 18																			
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	10/27/2022	4/26/2023
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	34.2	23
Calcium	ug/L	58000	61000	56600	62500	70700	76800	65700	75400	--	65600	63900	62200	73400	59000	61000	61800	66300	52800
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	1.2	2.1
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	<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	7.5	7.48
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	15.5	22.2
Total Dissolved Solids	mg/L	260	274	262	304	352	372	332	424	--	276	272	326	380	270	276	278	268	292
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	487	484.7
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	8.92	10.58
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	34.5	118.4
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	781.23	785.69
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	11.9	9.8
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	0	0.39
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	7.6	7.7



Appendix E
Alternative Source Demonstrations

E1 October 2022 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration October 2022 Detection Monitoring

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

Prepared for:



SCS ENGINEERS

25223067.00 | May 31, 2023

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

Table of Contents

Section	Page
PE Certification	iii
1.0 Introduction	1
1.1 §257.94(e)(2) Alternative Source Demonstration Requirements	1
1.2 Site Information and Map	1
1.3 Statistically Significant Increases Identified	2
1.4 Overview of Alternative Source Demonstration.....	2
2.0 Background	2
2.1 Regional Geology and Hydrogeology	3
2.1.1 Regional Information.....	3
2.1.2 Site Information.....	3
2.2 CCR Rule Monitoring System	3
2.3 Other Monitoring Wells.....	3
3.0 Methodology and Analysis Review	4
3.1 Sampling and Field Analysis	4
3.2 Laboratory Analysis Review	4
3.3 Statistical Evaluation Review.....	4
3.4 Summary of Methodology and Analysis Review Findings.....	5
4.0 Alternative Sources	5
4.1 Potential Causes of SSI.....	5
4.1.1 Natural Variation	5
4.1.2 Man-Made Alternative Sources	6
4.2 Lines of Evidence	6
4.2.1 Background Concentrations – Boron and Chloride.....	7
4.2.2 Background Concentrations – Calcium	7
4.2.3 Location Adjacent to Entrance Road.....	8
4.2.4 Mod 4-6 Composite Liner	8
5.0 Alternative Source Demonstration Conclusions	9
6.0 Site Groundwater Monitoring Recommendations	9
7.0 References	9

Tables

Table 1.	Groundwater Analytical Results Summary
Table 2.	Historical Analytical Results for Parameters with SSIs
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network

Figures



- Figure 1. Site Location Map
- Figure 2. Site Plan and Monitoring Well Locations
- Figure 3. Water Table Map – October 2022

Appendices

- Appendix A Trend Plots for CCR Wells
- Appendix B Historical Calcium Data
- Appendix C Calcium Correlation Plots

I:\25223067.00\Deliverables\COL MOD 4 ASD - October 2022\230531_COL_4-6 LF_Oct22 ASD_Final.docx

PE CERTIFICATION

	<p>I, Sherren Clark, hereby certify that 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.</p>	
	<p style="text-align: center;">  (signature) </p>	<p style="text-align: center;"> 5/31/2023 (date) </p>
	<p>(printed or typed name)</p>	
	<p>License number E-29863</p>	
	<p>My license renewal date is July 31, 2024.</p>	
<p>Pages or sheets covered by this seal: Alternative Source Demonstration, October 2022 Detection Monitoring, Dry Ash Disposal Facility, Modules 4-6 Columbia Energy Center, Pardeeville, Wisconsin (Entire Document)</p>		

[This page left blank intentionally]

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 2022 sampling event and a supplemental resampling event completed in November 2022.

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 SSIs observed in the statistical evaluation of the October 2022 detection monitoring event and the November 2022 resampling event at the Columbia Energy Center (COL) Dry Ash Disposal Facility, Modules 4-6 CCR Unit (Mod 4-6).

This ASD report is evaluating the SSIs for boron, chloride and calcium that were observed in the statistical evaluation of the October 2022 sampling and November 2022 resampling events.

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 Mod 4 CCR Unit became operational in 2018, following the construction of module 4. 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 (new landfill)

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, 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, and the October 2022 sampling results and the November 2022 resampling results, are summarized in the attached **Table 1**.

The October 2022 SSIs include the following parameters and wells:

- Boron: MW-309
- Calcium: MW-309
- Chloride: MW-310

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 SSIs are provided in **Table 2**. The laboratory reports for the October 2022 detection monitoring event will be included in the 2023 Annual Groundwater Monitoring and Corrective Action Report to be submitted in January 2024. 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

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 2022 is shown on **Figure 3**. Historically, localized groundwater mounding was associated with the ash ponds. The October 2022 flow map shows temporary inward gradients in the vicinity of the Secondary Ash Pond due to groundwater dewatering activities. These temporary changes in flow do not affect groundwater flow directions in the vicinity of Mod 4-6. The groundwater elevation data for the state and CCR monitoring program wells are provided in **Table 3**.

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 26 and 27, 2022. Retest samples were collected on November 30, 2022. 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 field analysis based on review of the data and field notes. Because boron, calcium, and chloride are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the October 2022 detection monitoring event and the November 2022 resampling event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for boron, chloride, or calcium. 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.

Following evaluation of the October 2022 sampling results, SCS resampled MW-309 and MW-310 for specific parameters on November 30, 2022. The resampling was performed on select parameters that exceeded UPLs in the October 2022 event, including boron and calcium for MW-309 and calcium and chloride for MW-310. Based on the review of the laboratory reports, SCS did not identify any additional issues due to a laboratory analysis error in the other laboratory reports. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the SSI constituent analytical data were 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 plots are provided in **Appendix A**. The boron and chloride concentrations observed are within the range of historical concentrations. The calcium concentrations detected at MW-309 in October and November 2022 are higher than previous results but are similar to each other, indicating that these results are not due to a sampling or laboratory error.

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 2022 sampling results and the November 2022 retest results, SSIs for boron and calcium occurred for MW-309, and an SSI occurred for chloride at MW-310 for the October 2022 semiannual event. The intrawell UPL at MW-310 was exceeded for calcium in October 2022, but the resample result in November 2022 was below the UPL. Therefore, according to the 1-of-2 retesting approach, there was no SSI for calcium at MW-310 in October 2022.

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 SSIs for boron, calcium, and/or chloride at wells MW-309 and MW-310. 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 2022 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. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, a UPL update is planned for 2023.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

In summary, there were no changes to the SSI determinations for the October 2022 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 boron, calcium, and chloride SSIs at the downgradient monitoring wells; 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 2022 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 boron, calcium, and chloride had been in operation for many

years, it is difficult to determine how much of the variation in boron, calcium, and chloride 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 boron, calcium, and chloride may reflect man-made sources. Based on historical data showing calcium concentrations at many site monitoring wells that are comparable to the October and November 2022 concentrations at MW-309, it appears that the elevated calcium concentration may also be at least partially due to natural fluctuations. Regardless of the source, natural temporal variations in infiltration and groundwater flow direction may have contributed to the SSIs for boron and calcium at MW-309 and for chloride at MW-310.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, calcium, and chloride 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, and/or other plant operations.

Based on the historic groundwater flow directions and on previous investigations at the site, the ash ponds and the former ash pond effluent ditch appear to be the most likely cause of the boron SSI for well MW-309.

Road salt use appears to be the most likely cause of the chloride SSI for MW-310. Road salt use also appears to be a likely cause for the calcium SSI for MW-309, as a result of sodium-calcium cation exchange.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, calcium, and chloride in compliance wells MW-309 and MW-310, relative to the intrawell background sampling, are due to one or more alternative sources include:

1. The detected concentrations of boron and chloride exceeding intrawell UPLs are below the background concentrations at other wells in the monitoring network. These results indicate that concentrations in these ranges were present in the groundwater in this area prior to initiation of CCR disposal in the Mod 4-6 CCR Unit. The background data for the intrawell statistical analysis represent pre-disposal conditions. Information about the historical boron and chloride concentrations is presented in **Section 4.2.1**.
2. The detected concentrations of calcium exceeding the intrawell UPL at MW-309 are within the range of concentrations detected at other on-site wells in the 1980s. These results indicate that concentrations in this range were present in the groundwater on site prior to the construction of the ADF. The background data for the intrawell statistical analysis represent pre-disposal conditions. Information about the historical calcium concentrations is presented in **Section 4.2.2**.
3. MW-309 and MW-310 are located adjacent to the plant entrance road, where elevated chloride concentrations due to road salt impacts are likely. Elevated calcium concentrations can also be caused by cation exchange following road salt application. More information about the effects of road salt on the chloride and calcium concentrations is presented in **Section 4.2.3**.

4. 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 and MW-310 by October 2022. More information about the composite liner is presented in **Section 4.2.4**.

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

4.2.1 Background Concentrations – Boron and Chloride

Historical boron and chloride concentrations for all five Mod 4-6 wells are shown in **Table 2** and on the time series plots in **Appendix A**. As shown on the time series plots, the concentrations of boron in the May 2020 through June 2021 samples from MW-309 were higher than the background results at MW-309, but do not exceed the range of background sampling results for MW-310, located approximately 300 feet to the west along Murray Road.

As discussed in more detail in the ASD for the May 2020 monitoring event (SCS, 2020), the background concentrations of boron in the area of the Mod 4-6 compliance wells likely reflect historical ash management activities at the site under different groundwater flow conditions. The background data for the intrawell statistical analysis represent pre-disposal conditions at MOD 4-6.

For chloride, the October 2022 results at MW-310 exceeded the intrawell UPL based on the 2018 background sampling at this well, but the chloride concentrations were lower than those detected in current monitoring at MW-309 (**Appendix A**).

These results indicate that boron and chloride concentrations in the ranges detected at the Mod 4-6 compliance wells in October and November 2022 were present in the groundwater in this area prior to initiation of CCR disposal in the Mod 4-6 CCR Unit. Based on these results, it is likely that the boron and chloride concentrations from natural and/or man-made alternative sources have varied in concentration at MW-309 and MW-310 in response to changes in groundwater flow and infiltration.

4.2.2 Background Concentrations – Calcium

Historical calcium concentrations for non-CCR Rule wells at the ADF and select wells associated with the Ash Ponds site are included in **Appendix B**. Both tabulated data and a plot of calcium concentrations over time are included in **Appendix B**. This table and plot include historical data available in the WDNR Groundwater Environmental Monitoring System (GEMS) database for monitoring wells at the COL ADF.

The earliest calcium data available from the GEMS database for wells associated with the ADF are from September 1984. Initial placement of CCR in test plots in Module 1 of the ADF was approved in October 1984, and CCR disposal began sometime after that. Therefore, the initial groundwater monitoring results in the GEMS database represent pre-disposal conditions for the landfill. The historical results for the ADF wells are from 1984 through 1987, and the results for the Ash Ponds site wells are from 1981 through 1992. Data for two wells associated with the COL Ash Ponds site, and located approximately 850 feet and 1,400 feet from MW-309, are also included in **Appendix B**.

The historical data show fluctuating historical calcium concentrations. Of the landfill wells and two closest pond wells to MW-309, 15 wells have historic calcium concentrations above 100 mg/L and four wells have at least one concentration above 150 mg/L.

These results indicate that the calcium concentrations detected in October and November 2022 at MW-309 were present in the groundwater in this area prior to construction of the ADF and initiation of CCR disposal in Mod 4-6, and the calcium SSI at MW-309 may be at least partially attributed to background concentrations.

4.2.3 Location Adjacent to Entrance Road

Monitoring well MW-310 is located adjacent to the plant entrance road, where elevated chloride concentrations due to road salt impacts are likely. In order to be located as close as possible to the waste boundary of the CCR Unit (including the Mod 5/6 additions constructed in 2021), these wells are installed between the entrance road and the storm water ditch on the south side of the road. At this location, there is a high potential for road salt application to result in increased chloride concentrations in groundwater.

It appears that elevated calcium concentrations at MW-309 are also at least partially attributable to road salt application. Calcium concentrations at both MW-309 and MW-310 are strongly correlated with chloride concentrations, with R^2 values greater than 0.6 (**Appendix C**); this correlation would be expected if calcium is being mobilized through cation exchange with sodium following road salt application. If complete cation exchange were occurring between sodium (from road salt) and calcium, an increase of two moles of chloride per mole of calcium would be expected. The actual ratio is higher, as indicated by the trendline slopes in **Appendix C**, indicating that incomplete cation exchange is occurring. Calcium concentrations at MW-309 and MW-310 are not strongly correlated with sulfate concentrations (**Appendix C**), indicating that co-dissolution of calcium and sulfate from anhydrite or gypsum in CCR (specifically flue gas desulfurization waste) is not a likely source of the increase in calcium concentrations. The molar concentrations for sulfate are lower than for calcium, which is not consistent with a CCR/flue gas desulfurization (FGD) source. Sulfate is expected to be more mobile than calcium in groundwater and would be expected to be at a similar or higher concentration than calcium if the source was a release from Mod 4-6.

A temporary increase in both calcium and chloride concentrations was previously observed at MW-309 in August 2018, prior to CCR disposal in Mod 4-6 (**Appendix A**). These fluctuations indicate that the increased concentrations are at least partly attributable to a seasonal or impermanent source such as road salt application.

4.2.4 Mod 4-6 Composite Liner

The Mod 4-6 CCR Unit was constructed with a composite liner system and leachate collection system, and has only been receiving CCR since late 2018; therefore, it is very unlikely that a release from Mod 4-6 could have reached MW-309 and MW-310 by October 2022. 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 liner was constructed in 2018, and CCR placement in Mod 4 began in November 2018. CCR placement in Mod 5-6 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 and MW-310 from Module 4 in less than four years, or travel to the wells from Modules 5 and 6 in less than one year. Based on the hydraulic conductivity of the liner clay (10^{-8} centimeters/second) and the very low estimated average groundwater velocity (0.2 to 4 feet per year [SCS, 2021b]), it is very unlikely that changes in boron, calcium, and chloride concentrations at MW-309 and MW-310 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.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron and calcium at MW-309 and for chloride at MW-310 demonstrate that the SSIs are likely due to sources other than the Mod 4-6 CCR Unit. Similar boron and chloride concentrations were present in the area prior to disposal of CCR in Mod 4-6. Similar calcium concentrations were historically detected at other monitoring wells located around the landfill and to the southeast of the ponds. The SSIs likely reflect road salt impacts (chloride and calcium) and impacts associated with historical discharges from the ash ponds via the effluent ditch located west of the landfill (boron). Natural variation associated with changes in infiltration and groundwater flow may also have contributed to the SSI for calcium.

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 2023 Annual Report due January 31, 2024.

7.0 REFERENCES

RMT, 2003, Water Table Map (October 2002), Figure 3.

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

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

SCS Engineers, 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.

[This page left blank intentionally]

Tables

- 1 Groundwater Analytical Results Summary
- 2 Historical Analytical Results for Parameters with SSIs
- 3 Groundwater Elevation – State Monitoring Program and CCR Well Network

Table 1. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Modules 4-6 / SCS Engineers Project #25223067.00

Parameter Name	Background Wells		Compliance Wells							
	MW-84A	MW-301	MW-309			MW-310			MW-311	
	10/27/2022	10/27/2022	Intrawell UPL	10/26/2022	11/30/2022	Intrawell UPL	10/26/2022	11/30/2022	Intrawell UPL	10/27/2022
Boron, µg/L	12.2	37.5	42.2	46.6	49.3	81.9	71.3	--	49.8	34.2
Calcium, µg/L	78,400	62,800 P6	99,900	162,000	153,000	56,000	68,900	55,500	84,200	66,300
Chloride, mg/L	3.4	2.3	901	796	--	205	323	215	4.41	1.2 J
Fluoride, mg/L	<0.095	<0.095 M0	DQ	<0.095	--	DQ	<0.095	--	DQ	<0.095
Field pH, Std. Units	7.31	6.80	8.18	7.23	--	8.12	7.61	--	8.07	7.50
Sulfate, mg/L	1.1 J	11.6	53.1	28.9	--	118	32.8	--	131	15.5
Total Dissolved Solids, mg/L	302	282	1,730	1670	--	759	750	--	462	268

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

Abbreviations:

mg/L = milligrams per liter
µg/L = micrograms per liter
-- = Not Analyzed

SSI = Statistically Significant
DQ = Double Quantification
LOD = Limit of Detection
LOQ = Limit of Quantitation

Lab Notes:

J = Estimated concentration at or above the LOD and below the LOQ.
P6 = Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Note:

- Intrawell UPLs based on 1-of-2 retesting approach; therefore, there is no SSI unless the original sample result and a retest result are above the UPL.
- Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.

Created by:	<u>NDK</u>	Date:	<u>9/19/2022</u>
Last revision by:	<u>NLB</u>	Date:	<u>4/26/2023</u>
Checked by:	<u>RM</u>	Date:	<u>5/3/2023</u>
Scientist/PM QA/QC:	<u>TK</u>	Date:	<u>5/15/2023</u>

I:\25223067.00\Deliverables\COL MOD 4 ASD - October 2022\Tables\[Table 1 - COL LF MOD 4_Screening Summary - Oct 2022.xlsx]Table 1 - 2022 Analytical

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

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (µg/L)	Chloride (mg/L)
Background	MW-301	12/22/2015	26.5	126,000	3.70 J
		4/5/2016	25.2	115,000	4.00
		7/8/2016	23.6	108,000	3.50 J
		10/13/2016	30.6	118,000	2.20
		12/29/2016	32.8	129,000	2.00 J
		1/25/2017	32.6	124,000	1.50 J
		4/11/2017	28.8	120,000	2.00
		6/6/2017	21.3	111,000	3.50
		8/8/2017	30.6	108,000	5.50
		10/23/2017	34.3	87,200	4.00
		4/25/2018	24.3	112,000	2.30
		8/8/2018	22.8	105,000	5.20
		10/24/2018	27.8	101,000	3.20
		4/2/2019	26.9	126,000	0.79 J
		10/9/2019	35.9	114,000	1.70
		2/3/2020	27.9	113,000	1.30 J
		5/29/2020	21.3	112,000	2.00 J
		10/8/2020	28.8	93,000	3.40
		4/14/2021	22.2	117,000	1.50 J
		10/14/2021	31.4	67,800 P6	2.7
	4/13/2022	28.7	97,300	1.9 J	
	10/27/2022	37.5	62,800 P6	2.30	
	MW-84A	12/22/2015	11.9	74,000	4.90
		4/5/2016	14.0	72,200	4.70
		7/8/2016	14.7	67,600	5.10
		10/13/2016	11.1	74,000	4.30
		12/29/2016	14.7	76,000	4.70
		1/25/2017	16.1	70,800	4.60
		4/11/2017	12.9	73,200	4.90
		6/6/2017	14.8	76,100	5.50
		8/8/2017	22.9	74,900	5.50
		10/24/2017	13.8	77,500	5.10
		4/25/2018	25.0	76,600	4.80
		8/8/2018	12.8	76,000	4.90
10/24/2018		10.1 J	74,000	4.20	
4/3/2019		13.6	80,100	3.60	
10/9/2019	12.0	73,500	3.90		
2/3/2020	15.7	72,700	3.70		
5/29/2020	10.0	77,600	3.70		
10/8/2020	9.7 J	69,200	4.30		
4/14/2021	14.3	69,100	4.40		
10/14/2021	11.1	75,300	3.5 M0		
4/13/2022	10.5	75,100	5.20		
10/27/2022	12.2	78,400	3.4		

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

Well Group	Well	Collection Date	Boron (µg/L)	Calcium (µg/L)	Chloride (mg/L)
Compliance	MW-309	2/21/2018	31.4	42,700	147
		3/23/2018	31.0	41,800	157
		4/23/2018	30.4	39,600	157
		5/24/2018	28.0	52,700	141
		6/23/2018	26.6	67,600	203
		7/23/2018	35.5	63,800	557
		8/22/2018	40.5	93,600	811
		9/21/2018	30.0	55,200	329
		4/2/2019	37.4	45,300	145
		10/8/2019	33.4	46,900	43.2
		5/29/2020	54.6	51,600	350
		6/30/2020	50.7	--	--
		8/6/2020	55.3	--	--
		10/8/2020	57.7	65,300	575
		12/11/2020	65.9	--	--
		4/13/2021	48.0	62,300	390
		6/11/2021	49.9	--	--
		10/14/2021**	36.4	83,100	519
		4/12/2022	32.5	80,200	319
	10/26/2022*	46.6	162,000	796	
	11/30/2022	49.3	153,000	--	
	2/21/2018	MW-310	67.1	32,400	19.8
	3/23/2018		62.1	33,400	21.7
	4/23/2018		60.7	32,100	22.1
	5/24/2018		59.2	32,100	68.6
	6/23/2018		61.4	34,300	59.8
	7/23/2018		69.5	39,700	118
	8/22/2018		64.2	38,800	139
	9/21/2018		80.3	54,100	152
	4/2/2019		73.0	38,800	76.0
	10/8/2019		81.8	57,600	190
	12/23/2019		--	55,400	--
	5/29/2020		74.4	41,100	128
	10/8/2020		77.6	62,000	310
	12/11/2020		--	56,800	227
	4/13/2021		69.6	49,300	227
	6/11/2021		--	--	220
	10/14/2021		72.0	38,900	84.5
	4/12/2022		72.0	31,900	35.2
	10/26/2022*		71.3	68,900	323
	11/30/2023	--	55,500	215	
	2/21/2018	MW-311	43.7	58,000	2.90
	3/23/2018		42.7	61,000	2.70
	4/23/2018		40.1	56,600	2.60
	5/24/2018		31.7	62,500	3.50
6/23/2018	33.6		70,700	3.00	
7/23/2018	30.1		76,800	2.00 J	
8/22/2018	32.4		65,700	2.00 J	
9/21/2018	27.5		75,400	3.90	
4/2/2019	35.7		65,600	1.90 J	
10/8/2019	33.5		63,900	1.50 J	
5/29/2020	25.7		62,200	1.50 J	
10/8/2020	26.2		73,400	1.40 J	
4/14/2021	33.6		59,000	1.30 J	
10/14/2021	31.7		61,000	1.3 J	
4/12/2022	32.7		61,800	1.0 J	
10/27/2022	34.2		66,300	1.2 J	

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

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

* - re-sampled and analyzed for boron & calcium on 11/30/2022

** - re-sampled for boron on pH on 12/21/2021

Note:

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

Created by:	<u>NDK</u>	Date:	<u>3/18/2021</u>
Last revision by:	<u>NLB</u>	Date:	<u>4/26/2023</u>
Checked by:	<u>RM</u>	Date:	<u>5/3/2023</u>
PM QC Check:	<u>TK</u>	Date:	<u>5/15/2023</u>

I:\25223067.00\Deliverables\COL MOD 4 ASD - October 2022\Tables\[Table 2 - Historical Analytical Results

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

Notes:
NM = not measured

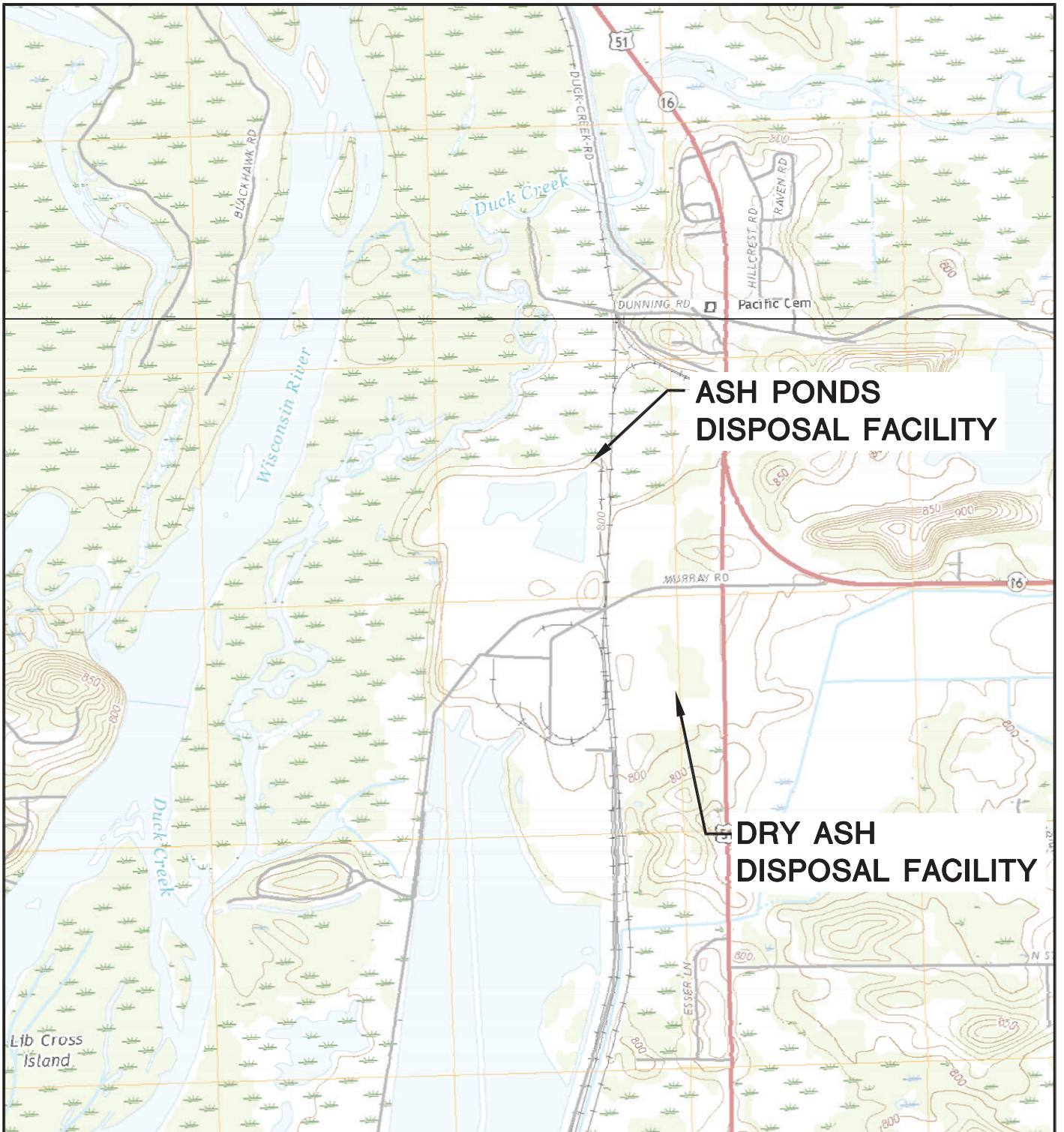
Created by:	<u>MDB</u>	Date:	<u>5/6/2013</u>
Last revision by:	<u>NLB</u>	Date:	<u>4/25/2023</u>
Checked by:	<u>RM</u>	Date:	<u>5/1/2023</u>

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

I:\25223067.00\Deliverables\COL MOD 4 ASD - October 2022\Tables\[Table 3 - GW Elevations.xls]levels

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – October 2022

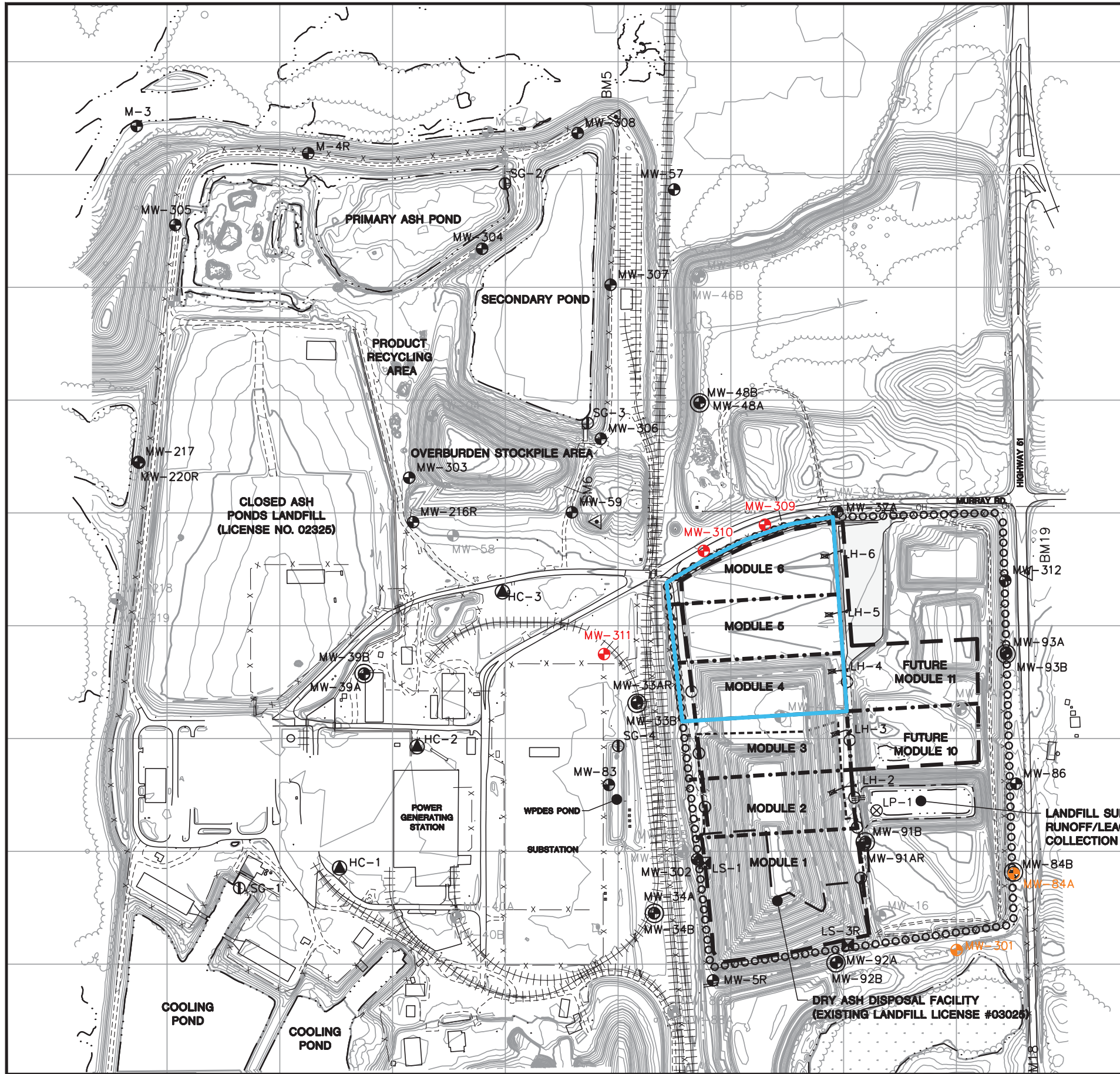


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



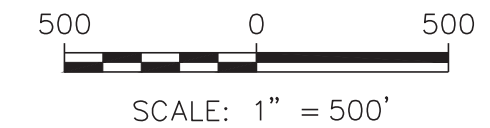
CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25220067.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
	DRAWN:	12/02/2019		CHECKED BY:	MDB			1
REVISED:	01/10/2020	APPROVED BY:	TK 04/10/2020					

I:\25220067.00\Drawings\ASD Mod 1-3 LF\Site Location Map.dwg, 4/12/2020 7:05:09 PM



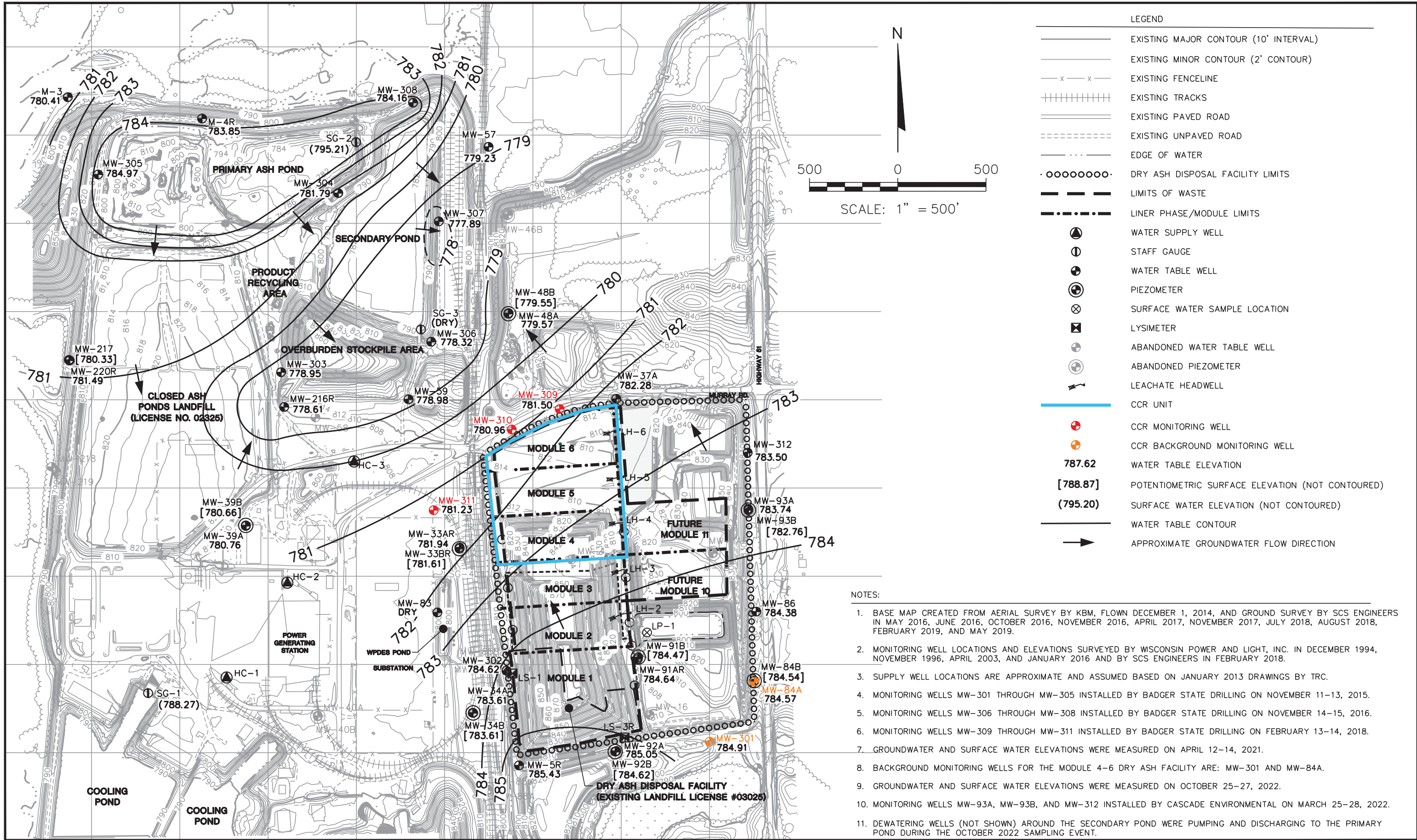
LEGEND	
	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
	DRY ASH DISPOSAL FACILITY LIMITS
	LIMITS OF WASTE
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE 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 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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
 8. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH DISPOSAL FACILITY ARE: MW-301 AND MW-84A.



PROJECT NO. 25222067.00	DRAWN BY: KP	ENGINEER		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
DRAWN: 12/02/2019	CHECKED BY: MDB							
REVISED: 01/16/2023	APPROVED BY: TK 5/30/2023							

I:\25222067.00\Drawings\Modules 4-6\Site Plan and Monitoring Well Locations Mod 4-6.dwg, 1/16/2023 3:06:53 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
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

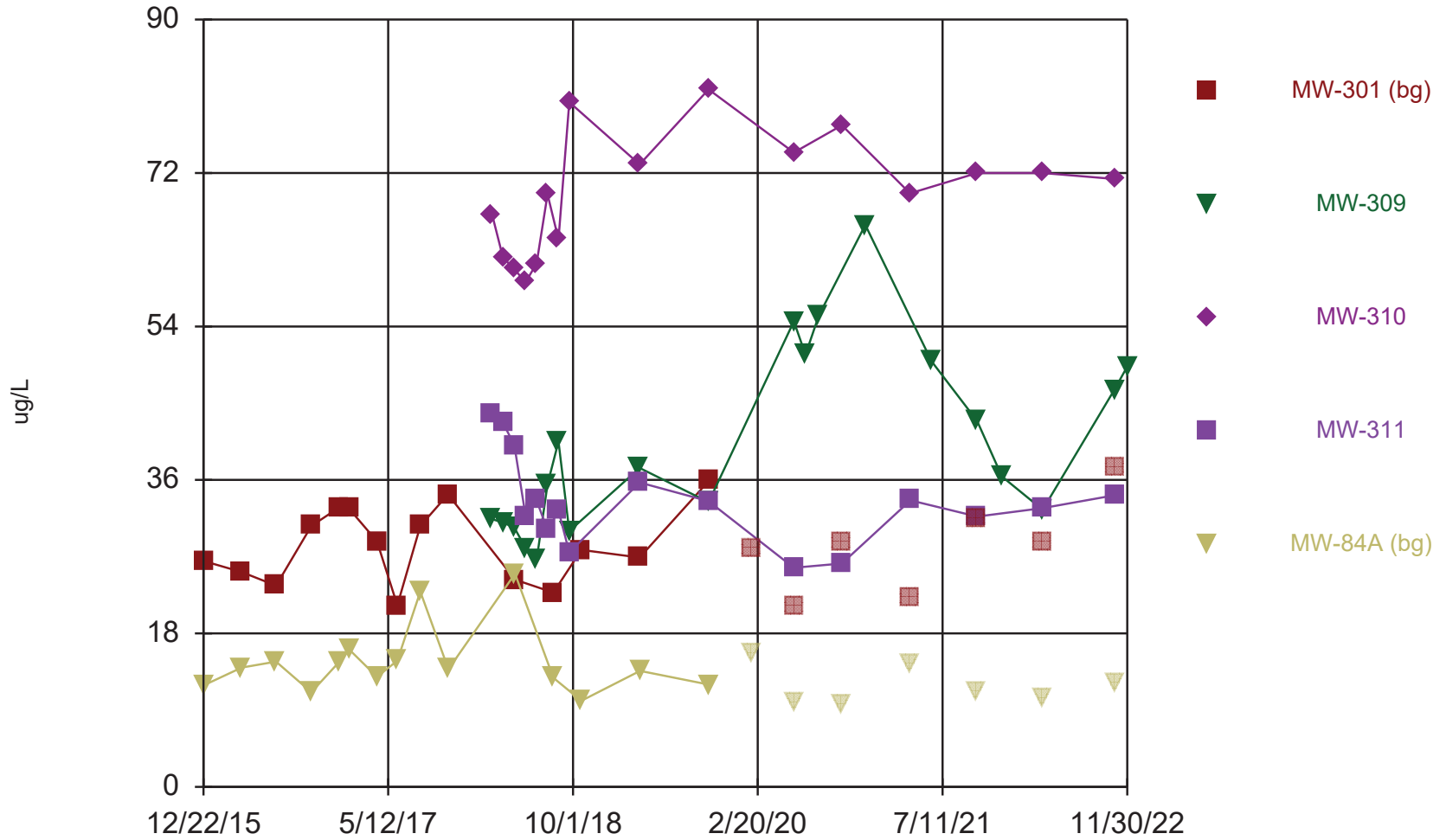
- NOTES:
1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AUGUST 2018, FEBRUARY 2019, AND MAY 2019.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED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

PROJECT NO. 25222067.00	DRAWN BY: KP	 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 OCTOBER 2022	FIGURE 3
DRAWN: 12/15/2022	CHECKED BY: MDB					
REVISED: 12/30/2022	APPROVED BY: TK, 1/16/2023					

I:\25222067.00\Drawings\Modules 4-6\Water Table Map-October 2022.dwg, 1/16/2023 2:40:42 PM

Appendix A
Trend Plots for CCR Wells

Boron



Time Series Analysis Run 5/19/2023 3:18 PM View: COL MOD 4-6

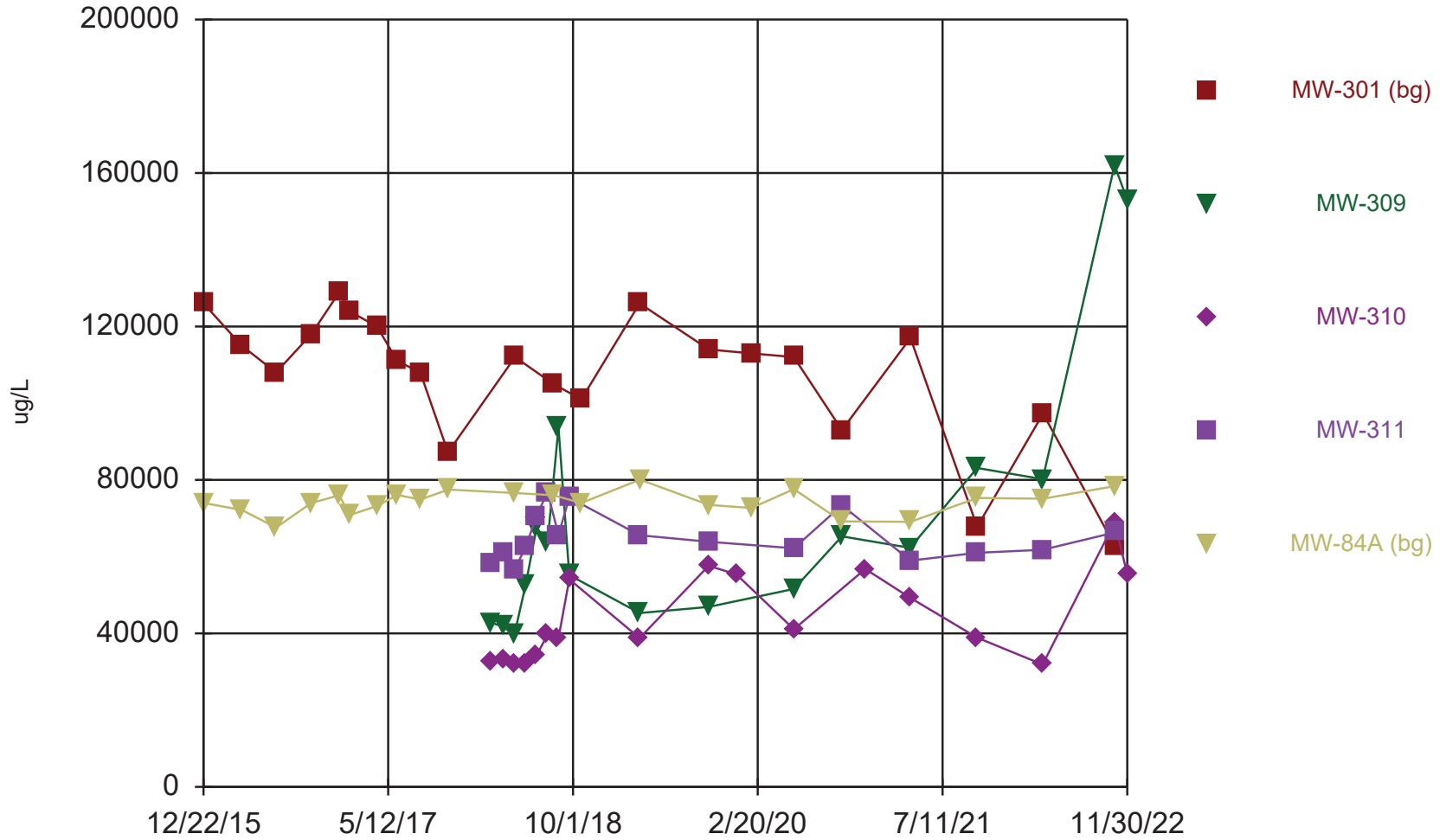
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 5/19/2023 3:27 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			

Calcium



Time Series Analysis Run 5/19/2023 3:18 PM View: COL MOD 4-6

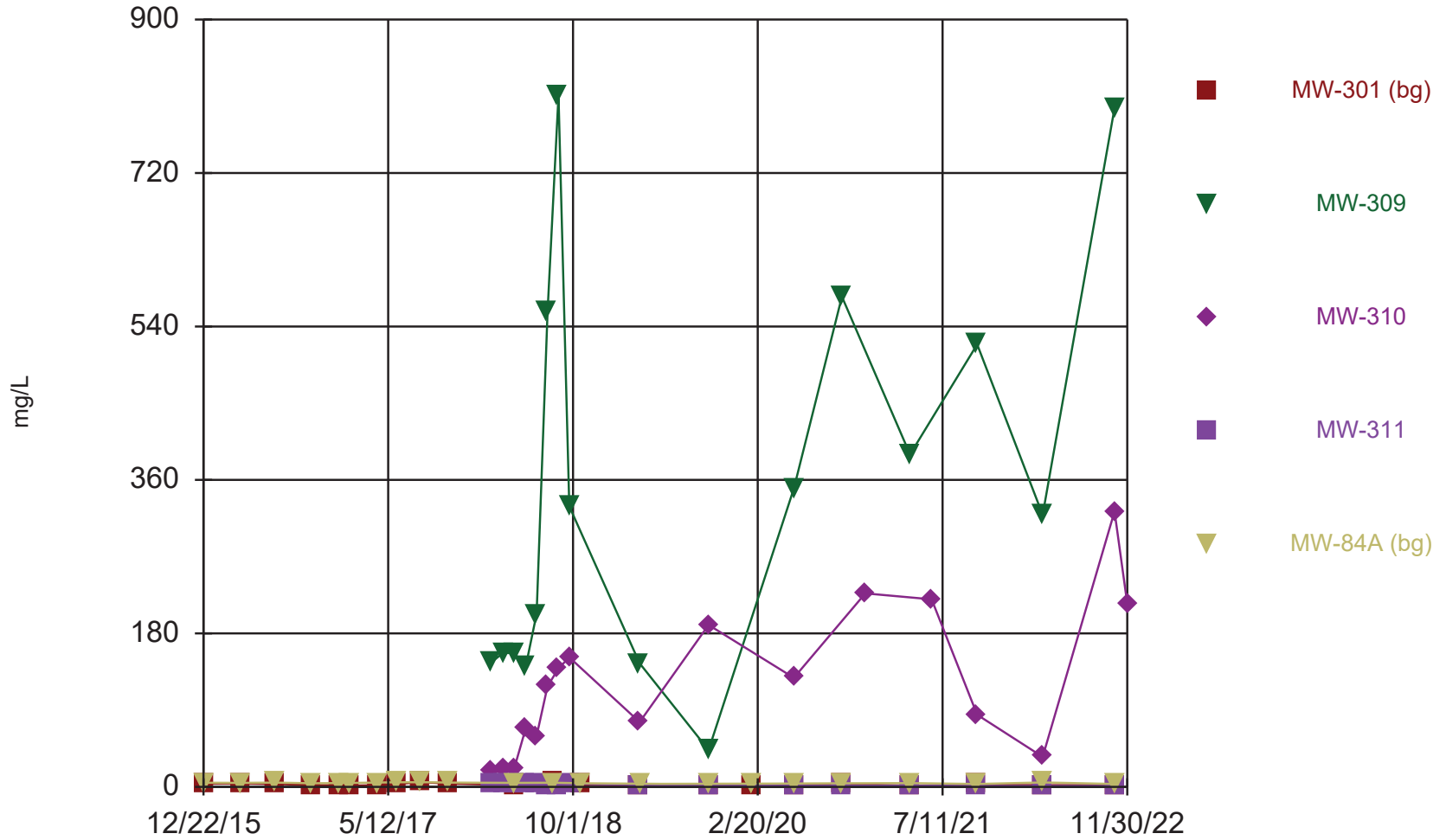
Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

Time Series

Constituent: Calcium (ug/L) Analysis Run 5/19/2023 3:27 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		

Chloride




Time Series Analysis Run 5/19/2023 3:18 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 5/19/2023 3:27 PM View: COL MOD 4-6
 Columbia Energy Center Client: SCS Engineers Data: December - Chem- export-Dec2020

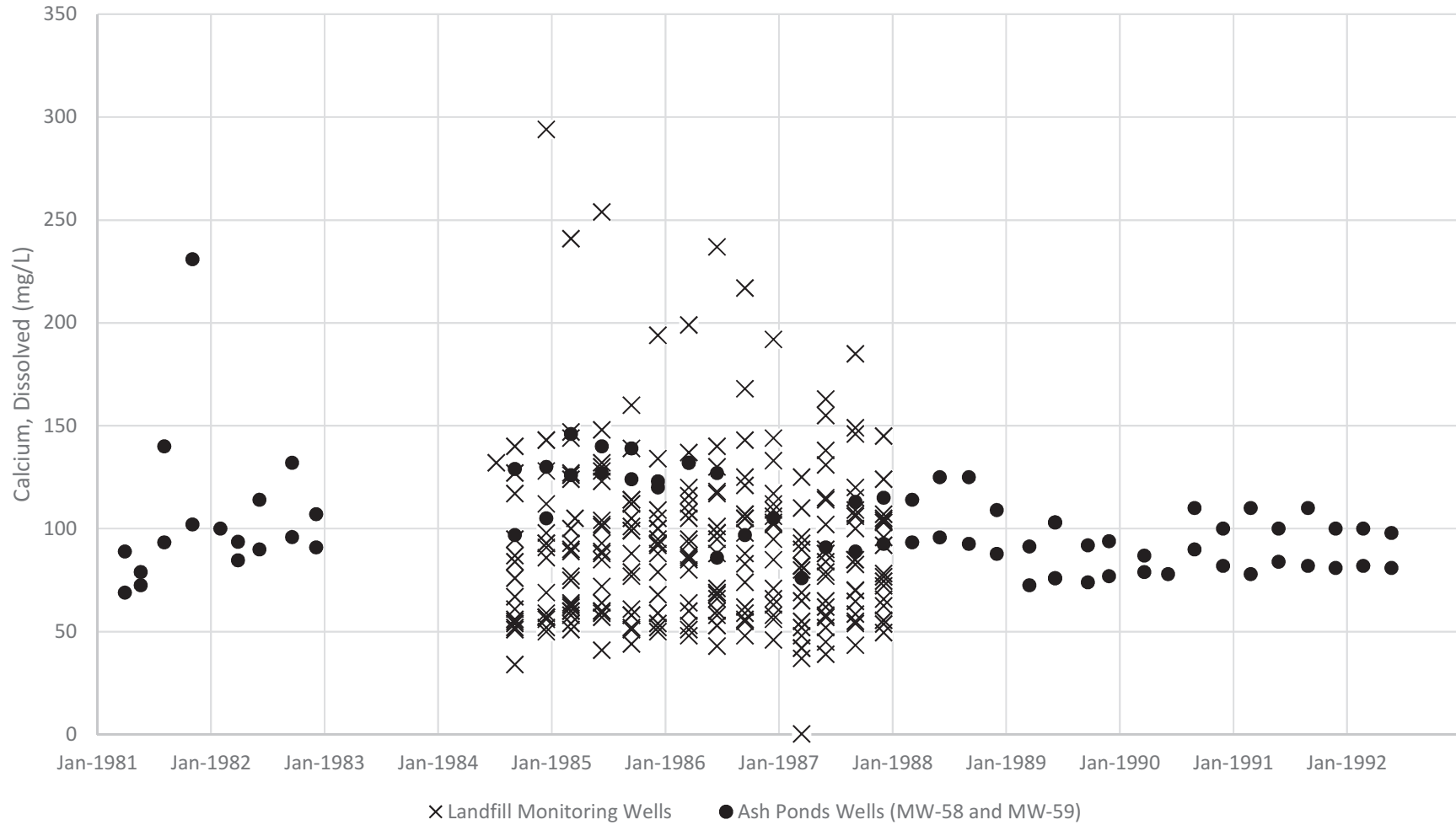
	MW-301 (bg)	MW-309	MW-310	MW-311	MW-84A (bg)
12/22/2015	3.7 (J)				4.9
4/5/2016	4				4.7
7/8/2016	3.5 (J)				5.1
10/13/2016	2.2				4.3
12/29/2016	2 (J)				4.7
1/25/2017	1.5 (J)				4.6
4/11/2017	2				4.9
6/6/2017	3.5				5.5
8/8/2017	5.5				5.5
10/23/2017	4				
10/24/2017					5.1
2/21/2018		147	19.8	2.9	
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		



Appendix B

Historical Calcium Data

Historical Calcium Concentrations



Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	86	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	75	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	85	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	79	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	88	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	95	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	95	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	98	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	103	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	82	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	102	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	106	mg/L
3025	43	MW88B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	124	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	294	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	241	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	254	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	160	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	194	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	199	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	140	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	168	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	133	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	110	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	131	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	149	mg/L
3025	42	MW88A	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	105	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	76	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	98	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	127	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	89	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	114	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	100	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	105	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	98	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	107	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	102	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	80	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	114	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	100	mg/L
3025	41	MW86	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	95.8	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	87	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	93	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	89	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	130	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	114	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	93	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	87	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	69	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	88	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	85	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	69	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	84	mg/L

Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	82.6	mg/L
3025	40	MW85	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	76.6	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	55	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	57	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	58	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	60	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	52	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	54	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	51	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	53	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	55	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	56	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	42	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	58	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	54	mg/L
3025	39	MW84B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	55.6	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	54	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	56	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	60	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	59	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	58	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	68	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	60	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	53	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	56	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	58	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	42	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	57	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	58.6	mg/L
3025	38	MW84A	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	62.6	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	67	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	69	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	77	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	88	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	101	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	105	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	120	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	118	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	121	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	117	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	90	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	115	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	85	mg/L
3025	37	MW82B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	92	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	7/9/1984	132	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	128	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	124	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	132	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	112	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	93	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	80	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	69	mg/L

Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	74	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	71	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	0.32	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	77	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	70.2	mg/L
3025	36	MW82A	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	74.5	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	91	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	90	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	93	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	88	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	88	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	88	mg/L
3025	35	MW81	CALCIUM, DISSOLVED (MG/L CA)	9/7/1987	85	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	56	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	57	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	60	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	60	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	58	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	59	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	53	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	58	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	59	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	63	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	48	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	62	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	70	mg/L
3025	34	MW80B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	65.8	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	61	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	59	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	63	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	64	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	61	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	59	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	64	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	68	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	62	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	66	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	55	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	52	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	55	mg/L
3025	33	MW80A	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	53.7	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	84	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	93	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	93	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	104	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	105	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	95	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	116	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	117	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	125	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	112	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	82	mg/L

Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	88	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	115	mg/L
3025	10	MW5	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	104	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	140	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	143	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	144	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	148	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	139	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	134	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	137	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	130	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	143	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	144	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	125	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	138	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	146	mg/L
3025	9	MW4	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	145	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	34	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	50	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	62	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	72	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	60	mg/L
3025	23	MW37B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	39	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	51	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	57	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	64	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	64	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	66	mg/L
3025	22	MW37A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	65	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	112	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	51	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	41	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	44	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	79	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	85	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	71	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	83	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	65	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	155	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	64.7	mg/L
3025	21	MW34B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	78.3	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	127	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	57	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	147	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	128	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	77	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	50	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	86	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	237	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	217	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	192	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	96	mg/L

Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	163	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	185	mg/L
3025	20	MW34A	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	72.3	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	3/20/1985	105	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	102	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	99	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	100	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	112	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	101	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	105	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	106	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	52	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	79	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	107	mg/L
3025	15	MW25	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	107	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	117	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	143	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	126	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	123	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	112	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	109	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	108	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	98	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	105	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	95	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	82	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	90	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	109	mg/L
3025	8	MW1B	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	103	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	95	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	93	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	100	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	101	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	99	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	92	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	93	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	98	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	107	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	109	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	93	mg/L
3025	7	MW1A	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	120	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	52	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	52	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	54	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	57	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	51	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	52	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	48	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	43	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	48	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	46	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	37	mg/L

Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	45	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	43.4	mg/L
3025	11	MW16	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	49.5	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	3/30/1981	89	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	5/21/1981	72.5	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	8/4/1981	93.3	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	11/3/1981	102	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	2/1/1982	100	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	3/30/1982	84.6	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	6/7/1982	90	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	9/20/1982	96	mg/L
2325	108	W59 (W-2)	CALCIUM, TOTAL (MG/L CA)	12/7/1982	91	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	97	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	105	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	126	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	127	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	124	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	123	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	132	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	86	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/18/1986	97	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/19/1986	105	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/20/1987	76	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/5/1987	91	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	89	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	92.6	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/10/1988	93.4	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/7/1988	95.8	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/8/1988	92.7	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/7/1988	87.8	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/22/1989	91.4	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/13/1989	76	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/14/1989	76	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/27/1989	74	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/4/1989	77	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/28/1990	79	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/12/1990	78	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/5/1990	90	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/6/1990	82	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/5/1991	78	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/3/1991	84	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	9/6/1991	82	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	12/4/1991	81	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	3/2/1992	82	mg/L
2325	108	W59 (W-2)	CALCIUM, DISSOLVED (MG/L CA)	6/1/1992	81	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	3/30/1981	69	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	5/21/1981	79	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	8/4/1981	140	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	11/3/1981	231	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	3/30/1982	93.6	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	6/7/1982	114	mg/L
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	9/20/1982	132	mg/L

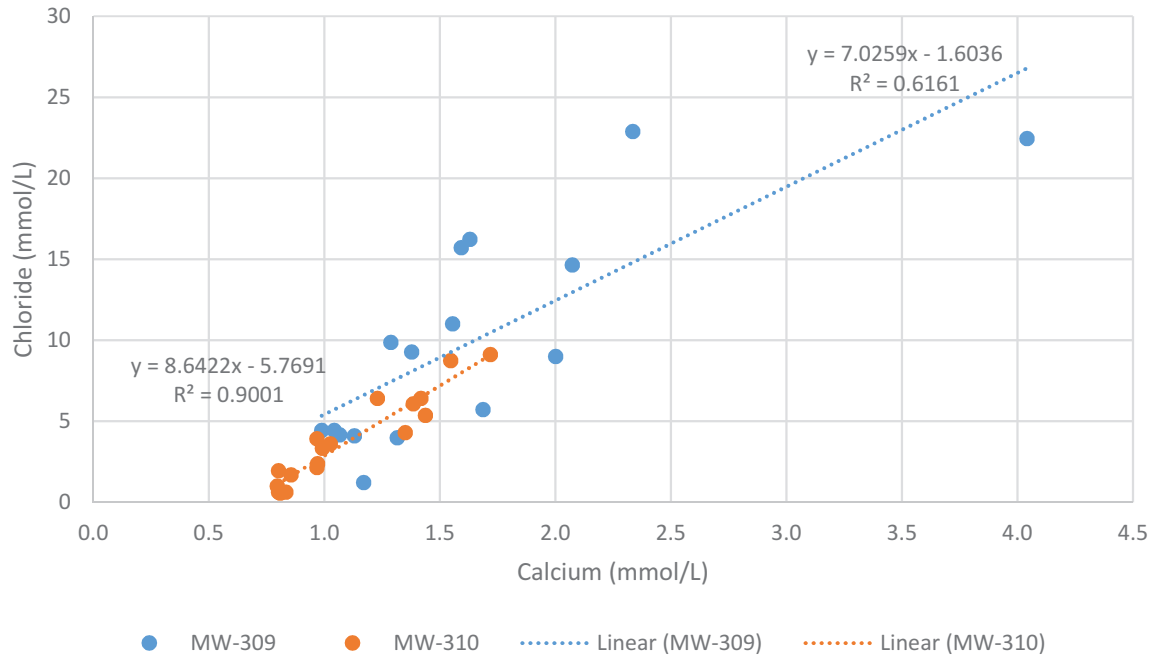
Historical Calcium Results
License #3025 Wells and Select License #2325 Wells

Lic#	Point ID	Point Name	Parameter Description	Sample Date	Result Value	Result Unit
2325	107	W58 (W-1)	CALCIUM, TOTAL (MG/L CA)	12/7/1982	107	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/7/1984	129	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/17/1984	130	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/7/1985	146	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/14/1985	140	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/18/1985	139	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/12/1985	120	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/21/1986	132	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/20/1986	127	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/9/1987	113	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/9/1987	115	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/10/1988	114	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/7/1988	125	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/8/1988	125	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/7/1988	109	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/22/1989	72.5	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/13/1989	103	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/14/1989	103	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/27/1989	92	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/4/1989	94	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/28/1990	87	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/5/1990	110	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/6/1990	100	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/5/1991	110	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/3/1991	100	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	9/6/1991	110	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	12/4/1991	100	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	3/2/1992	100	mg/L
2325	107	W58 (W-1)	CALCIUM, DISSOLVED (MG/L CA)	6/1/1992	98	mg/L

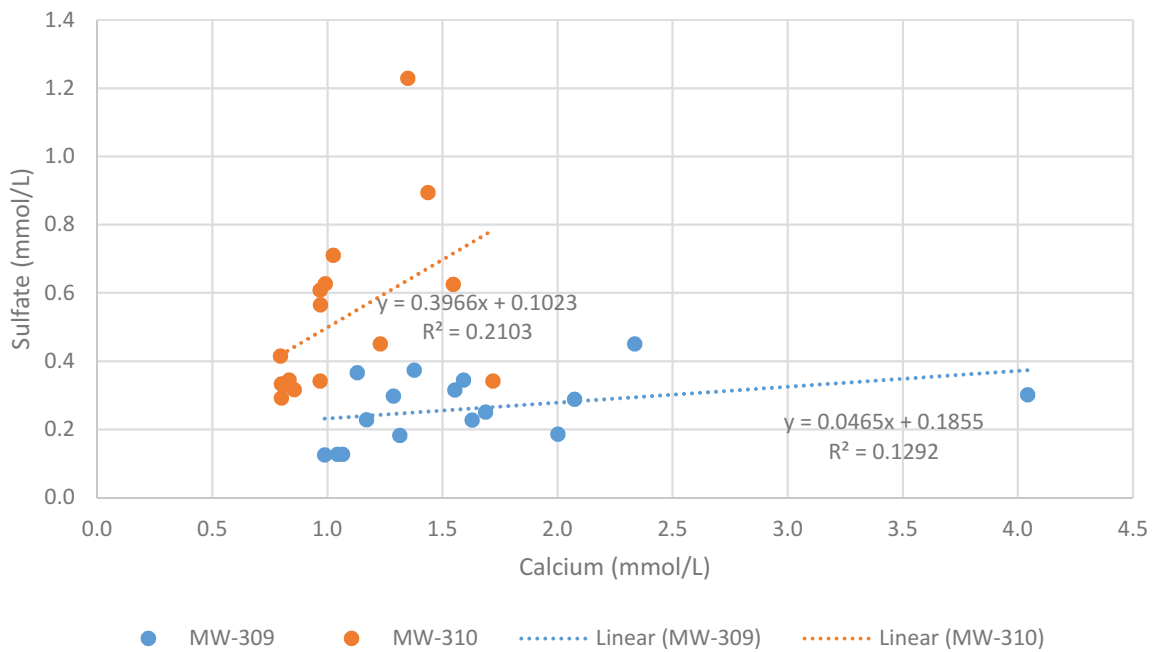
Appendix C

Calcium Correlation Plots

Columbia MW-309 and MW-310, Comparison of Cl to Ca Molarity



Columbia MW-309 and MW-310, Comparison of SO4 to Ca Molarity



E2 April 2023 Detection Monitoring Alternative Source Demonstration

Alternative Source Demonstration April 2023 Detection Monitoring

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

Prepared for:



SCS ENGINEERS

25223067.00 | November 22, 2023

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

Table of Contents

Section	Page
PE Certification	iii
1.0 Introduction	1
1.1 §257.94(e)(2) Alternative Source Demonstration Requirements	1
1.2 Site Information and Map	1
1.3 Statistically Significant Increases Identified	2
1.4 Overview of Alternative Source Demonstration.....	2
2.0 Background	2
2.1 Regional Geology and Hydrogeology	3
2.1.1 Regional Information.....	3
2.1.2 Site Information and Groundwater Flow	3
2.2 CCR Rule Monitoring System	3
2.3 Other Monitoring Wells.....	4
3.0 Methodology and Analysis Review	4
3.1 Sampling and Field Analysis	4
3.2 Laboratory Analysis Review	4
3.3 Statistical Evaluation Review.....	5
3.4 Summary of Methodology and Analysis Review Findings	5
4.0 Alternative Sources	5
4.1 Potential Causes of SSI.....	5
4.1.1 Natural Variation	5
4.1.2 Man-Made Alternative Sources	6
4.2 Lines of Evidence	6
4.2.1 Mod 4-6 Composite Liner	7
4.2.2 Area Background Concentrations for Boron and Sulfate.....	7
4.2.3 Boron and Sulfate Concentration Changes with Time	8
4.2.4 Influence of Dewatering Well Pumping.....	8
4.2.5 Surface Water Infiltration Effects	9
5.0 Alternative Source Demonstration Conclusions	9
6.0 Site Groundwater Monitoring Recommendations	9
7.0 References	10

Tables

Table 1.	Groundwater Analytical Results Summary
Table 2.	Historical Analytical Results for Parameters with SSIs
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network

Figures



- Figure 1. Site Location Map
- Figure 2. Site Plan and Monitoring Well Locations
- Figure 3. Water Table Map – April 2023

Appendices

- Appendix A Trend Plots for CCR Wells
- Appendix B 2022 Water Table Maps

I:\25223067.00\Deliverables\COL MOD4-6 ASD - April 2023\231122_COL_4-6 LF_Apr23 ASD_Final.docx

PE CERTIFICATION

 <p>11/22/2023</p>	<p>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.</p>	
	<p></p> <p>(signature)</p>	<p>11/22/2023</p> <p>(date)</p>
	<p>Sherren Clark</p> <p>(printed or typed name)</p>	
	<p>License number E-29863</p> <p>My license renewal date is July 31, 2024.</p>	
	<p>Pages or sheets covered by this seal: Alternative Source Demonstration, April 2023 Detection Monitoring, Dry Ash Disposal Facility, Modules 4-6 Columbia Energy Center, Pardeeville, Wisconsin (Entire Document)</p>	

[This page left blank intentionally]

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 2023 sampling event and a supplemental resampling event completed in June 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 SSIs for boron and sulfate that were observed in the statistical evaluation of the April 2023 detection monitoring event and the June 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 Mod 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 (new landfill)

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, 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 April 2023 sampling results, and the June 2023 resampling results are summarized in the attached **Table 1**.

The April 2023 SSIs include the following parameters and wells:

- Boron: MW-309
- Sulfate: MW-309

Results for additional sampling of MW-309 in October and November are also included in **Table 1**.

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 SSIs are provided in **Table 2**. The laboratory reports for the April 2023 detection monitoring event will be included in the 2023 Annual Groundwater Monitoring and Corrective Action Report to be submitted in January 2024. 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 2023 is shown on **Figure 3**. The groundwater elevation data for the state and CCR monitoring program wells are provided in **Table 3** and a time series plot of groundwater elevations at the CCR wells is provided in **Appendix A**.

Historically, localized groundwater mounding was associated with the ash ponds; however, flow in the ash pond 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 April 2023 flow map shows temporary inward gradients in the vicinity of the Primary and Secondary Ash Ponds due to groundwater dewatering activities. For comparison, the April 2022 and October 2022 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 April 26 and 27, 2023. Retest samples were collected on June 29, 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 field analysis based on review of the data and field notes. Because boron and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory reports for the April 2023 detection monitoring event and the June 2023 resampling event were reviewed to determine if any laboratory analysis error or issue may have caused or contributed to an observed SSI for boron or 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.

Following evaluation of the April 2023 sampling results, SCS resampled MW-309 for specific parameters on June 29, 2023. The resampling was performed on select parameters that exceeded UPLs in the April 2023 event, including boron and sulfate for MW-309. Based on the review of the laboratory reports, SCS did not identify any additional issues due to a laboratory analysis error in the other laboratory reports. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the SSI constituent analytical data were 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 plots are provided in **Appendix A**. The boron and sulfate concentrations observed are within the range of historical concentrations for the COL ADF as a whole.

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 2023 sampling results and the June 2023 retest results, SSIs for boron and sulfate occurred for MW-309 for the April 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 SSIs for boron or 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 April 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 April 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 boron and sulfate SSIs at the downgradient monitoring wells; 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 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 boron and sulfate had been in operation for many years, it is difficult to determine how much of the variation in boron and 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 boron and sulfate may reflect man-made sources. Regardless of the source, natural temporal variations in infiltration and groundwater flow direction may have contributed to the SSIs for boron and sulfate at MW-309.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron and 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 boron and 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 2023 SSIs for boron and 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 SSIs for boron and 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 April 2023. More information about the composite liner is presented in **Section 4.2.5**.
2. The detected concentrations of boron exceeding the intrawell UPL for MW-309 are below the background UPL for nearby compliance well MW-310. These results indicate that concentrations in this range were present in the groundwater in this area prior to initiation of CCR disposal in the Mod 4-6 CCR Unit. The background data for the intrawell statistical analysis represent pre-disposal conditions. Information about the historical boron concentrations is presented in **Section 4.2.1**.
3. The concentrations of boron and sulfate dropped significantly in the results from 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. More information about the concentration changes with time is presented in **Section 4.2.2**.

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 4.2.3**.
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 4.2.4**.
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 MOD 4 and since 2022 in MODs 5 and 6. Given the short active time frame, it is very unlikely that a release from Mod 4-6 could have reached MW-309 by April 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 MOD 4 liner was constructed in 2018, and CCR placement in Mod 4 began in November 2018. CCR placement in Mod 5-6 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 five years, or travel to the wells from Modules 5 and 6 in less than one 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 Boron and Sulfate

The detected concentrations of boron exceeding the intrawell UPL for MW-309 are below the background UPL for nearby compliance well MW-310. These results indicate that concentrations in this range were present in the groundwater in this area prior to initiation of CCR disposal in the Mod 4-6 CCR Unit. The background data for the intrawell statistical analysis represent pre-disposal conditions.

Historical boron concentrations for all five Mod 4-6 wells are shown in **Table 2** and on the time series plots in **Appendix A**. As shown on the time series plots, the concentrations of boron in the May 2020 through the April 2023 samples from MW-309 were generally higher than the background results at MW-309, but do not exceed the range of background sampling results for MW-310, located approximately 300 feet to the west along Murray Road.

As discussed in more detail in the ASD for the May 2020 monitoring event (SCS, 2020), the background concentrations of boron in the area of the Mod 4-6 compliance wells likely reflect historical ash management activities at the site under different groundwater flow conditions. The background data for the intrawell statistical analysis represent pre-disposal conditions at MOD 4-6.

These results indicate that boron concentrations in the ranges detected at the Mod 4-6 compliance wells in April and June 2023 were present in the groundwater in this area prior to initiation of CCR disposal in the Mod 4-6 CCR Unit. Based on these results, it is likely that the boron concentrations from natural and/or man-made alternative sources have varied in concentration at MW-309 in response to changes in groundwater flow and infiltration.

For sulfate, the April and June 2023 concentrations at MW-309 exceeded the intrawell UPLs for all three compliance wells, but the recent October 2023 result for sulfate at MW-309 was within the range of background concentrations for nearby well MW-310. The October result indicates 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 Boron and Sulfate Concentration Changes with Time

The concentrations of boron and 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 boron and sulfate concentrations from all five MOD 4-6 wells are shown in **Table 2** and on the time series plots in **Appendix A**. These concentrations were then followed by a sharp decline in the October 2023 sampling event.

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 April 2023 flow map (**Figure 3**) shows temporary inward gradients in the vicinity of the Primary Ash Pond and Secondary Pond due to groundwater dewatering activities. For comparison, the April 2022 and October 2022 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 the 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 MOD 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 boron and 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 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 SSIs reported for boron and 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 2023 Annual Report due January 31, 2024.

7.0 REFERENCES

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

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

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

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

SCS Engineers, 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.

Tables

- 1 Groundwater Analytical Results Summary
- 2 Historical Analytical Results for Parameters with SSIs
- 3 Groundwater Elevation – State Monitoring Program and CCR Well Network

**Table 1. Groundwater Analytical Results Summary
Columbia Dry Ash Disposal Facility - Module 4-6 / SCS Engineers Project #25222067.00**

Parameter Name	Background Wells		Compliance Wells								
	MW-84A	MW-301	MW-309				MW-310		MW-311		
	4/27/2023	4/27/2023	Intrawell UPL	4/26/2023	6/29/2023	10/9/2023	11/9/2023	Intrawell UPL	4/26/2023	Intrawell UPL	4/26/2023
Groundwater Elevation, ft amsl	786.97	787.57		785.05	784.12	782.58	782.76		785.18		785.69
Appendix III											
Boron, µg/L	10.3	20.1	42.2	50.8	59.4	41.5	--	81.9	57.5	49.8	23.0
Calcium, µg/L	68,600	120,000	99,900	35,500	--	66,800	--	56,000	36,800	84,200	52,800
Chloride, mg/L	3.0	1.5 J	901	372	--	259	--	205	128	4.41	2.1
Fluoride, mg/L	<0.095	<0.095	DQ	<0.095	--	<0.095	--	DQ	<0.095	DQ	<0.095
Field pH, Std. Units	7.01	6.65	8.18	7.61	7.72	7.43	7.25	8.12	7.27	8.07	7.48
Sulfate, mg/L	1.3 J	12.3	53.1	143	147	80.6	89.0	118	102	131	22.2
Total Dissolved Solids, mg/L	326	526	1,730	1,250	--	858	--	759	654	462	292

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:

- 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.
- Intrawell UPL for fluoride is based on the double quantification rule, because fluoride was not detected above the LOQ in the background samples.
- Intrawell UPLs were calculated from background sampling results for the compliance wells from February 2018 through September 2018.

Created by: NDK
Last revision by: RM
Checked by: NLB
Scientist/PM QA/QC: TK

Date: 12/2/2022
Date: 11/14/2023
Date: 11/14/2023
Date: 11/14/2023

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

Well Group	Well	Collection Date	Boron (µg/L)	Sulfate (mg/L)
Background	MW-301	12/22/2015	26.5	9.3
		4/5/2016	25.2	15.3
		7/8/2016	23.6	15
		10/13/2016	30.6	13.9
		12/29/2016	32.8	12.3 J
		1/25/2017	32.6	6.5
		4/11/2017	28.8	10.3
		6/6/2017	21.3	17.1
		8/8/2017	30.6	31.6
		10/23/2017	34.3	27.5
		4/25/2018	24.3	8.6
		8/8/2018	22.8	21.6
		10/24/2018	27.8	19.2
		4/2/2019	26.9	4.4
		10/9/2019	35.9	8.4
		2/3/2020	27.9	7.2
		5/29/2020	21.3	11.5
		10/8/2020	28.8	25.1
		4/14/2021	22.2	8.5
		10/14/2021	31.4	17.4
	4/13/2022	28.7	12.7	
	10/27/2022	37.5	11.6	
	4/27/2023	20.1	12.3	
	10/11/2023	36.2	11.8	
	MW-84A	12/22/2015	11.9	4.9
		4/5/2016	14.0	4.3
		7/8/2016	14.7	3.7 J
		10/13/2016	11.1	2.6 J
		12/29/2016	14.7	2.7 J
		1/25/2017	16.1	3
		4/11/2017	12.9	2.8 J
		6/6/2017	14.8	2.7 J
		8/8/2017	22.9	2 J
		10/24/2017	13.8	2.2 J
		4/25/2018	25.0	2.8 J
8/8/2018		12.8	1.9 J	
10/24/2018		10.1 J	1.6 J	
4/3/2019		13.6	1.4 J	
10/9/2019		12.0	1.3 J	
2/3/2020	15.7	<2.2		
5/29/2020	10.0	1.5 J		
10/8/2020	9.7 J	1.3 J		
4/14/2021	14.3	1.4 J		
10/14/2021	11.1	1.3 J		
4/13/2022	10.5	1.4 J		
10/27/2022	12.2	1.1 J		
4/27/2023	10.3	1.3 J		
10/11/2023	14.0	1.4 J		

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

Well Group	Well	Collection Date	Boron (µg/L)	Sulfate (mg/L)
Compliance	MW-309	2/21/2018	31.4	12.2
		3/23/2018	31.0	12.2
		4/23/2018	30.4	12
		5/24/2018	28.0	17.5
		6/23/2018	26.6	24.1
		7/23/2018	35.5	33.1
		8/22/2018	40.5	43.3
		9/21/2018	30.0	35.9
		4/2/2019	37.4	35.2
		10/8/2019	33.4	21.9
		5/29/2020	54.6	28.6
		6/30/2020	50.7	--
		8/6/2020	55.3	--
		10/8/2020	57.7	21.8
		12/11/2020	65.9	--
		4/13/2021	48.0	30.3
		6/11/2021	49.9	--
		10/14/2021	42.9	27.7
		12/21/2021	36.4	--
		4/12/2022	32.5	17.9
		10/26/2022	46.6	28.9
		11/30/2022	49.3	--
		4/26/2023	50.8	143
		6/29/2023	59.4	147
	10/9/2023	41.5	80.6	
	11/9/2023	--	89.0	
	MW-310	2/21/2018	67.1	31.6
		3/23/2018	62.1	33.1
		4/23/2018	60.7	32
		5/24/2018	59.2	28
		6/23/2018	61.4	30.4
		7/23/2018	69.5	60.2
		8/22/2018	64.2	32.8
		9/21/2018	80.3	118
4/2/2019		73	58.4	
10/8/2019		82	85.9	
5/29/2020		74	68.2	
10/8/2020		77.6	60	
4/13/2021		69.6	43.3	
10/14/2021		72.0	54.3	
4/12/2022	72.0	39.8		
10/26/2022	71.3	32.8		
4/26/2023	57.5	102		
10/9/2023	65.6	90.7		

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

Well Group	Well	Collection Date	Boron (µg/L)	Sulfate (mg/L)
Compliance	MW-311	2/21/2018	43.7	7.1
		3/23/2018	42.7	7.2
		4/23/2018	40.1	7.9
		5/24/2018	31.7	36.9
		6/23/2018	33.6	72.3
		7/23/2018	30.1	84.7
		8/22/2018	32.4	53.6
		9/21/2018	27.5	92.4
		4/2/2019	35.7	23.1
		10/8/2019	33.5	21.2
		5/29/2020	25.7	39.1
		10/8/2020	26.2	72.1
		4/14/2021	33.6	15.6
		10/14/2021	31.7	14.2
		4/12/2022	32.7	8.9
		10/27/2022	34.2	15.5
		4/26/2023	23.0	22.2
		10/9/2023	31.0	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.

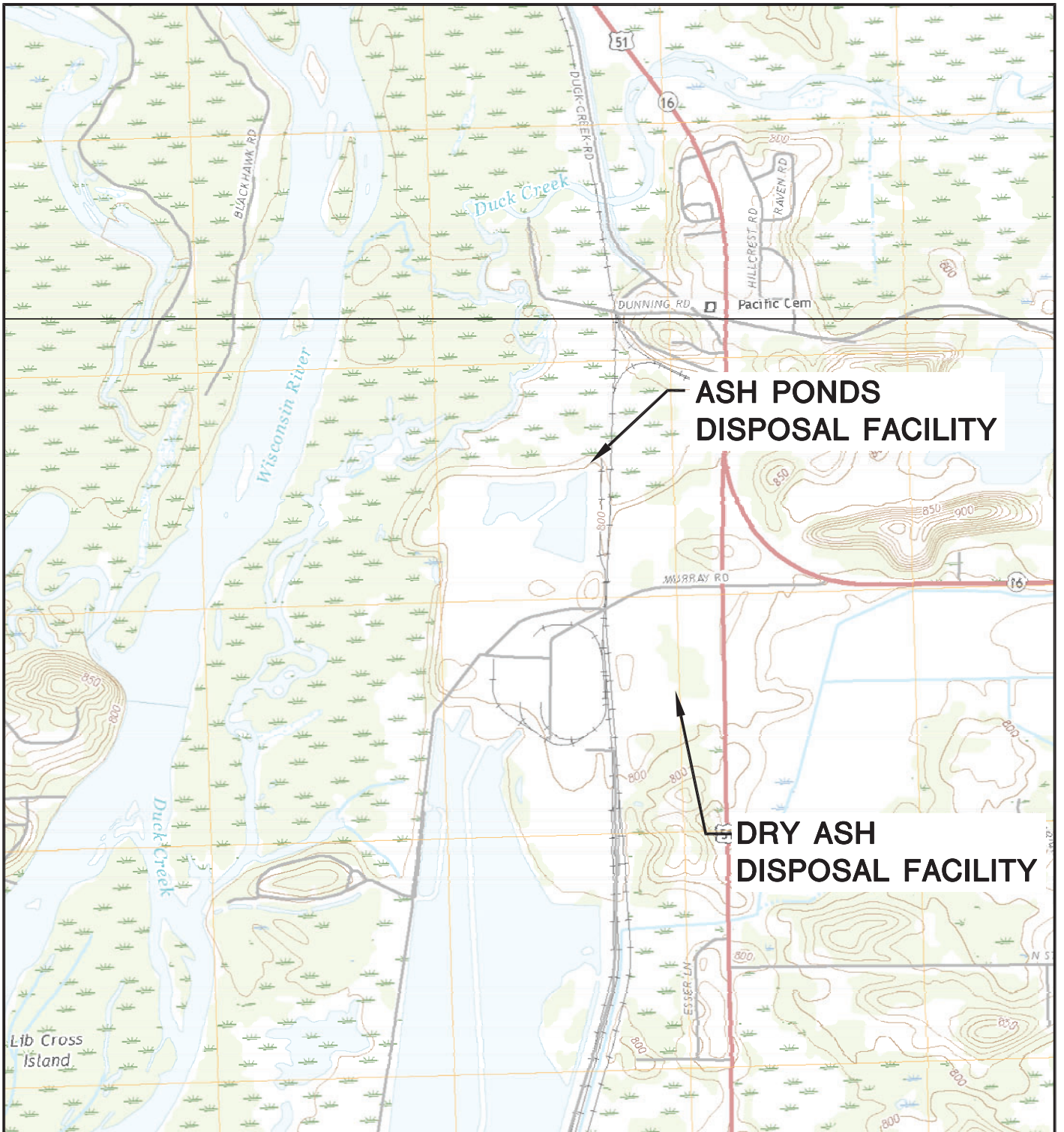
Created by: SCC
 Checked by: NLB
 PM QC Check: TK

Date: 11/8/2023
 Date: 11/21/2023
 Date: 11/21/2023

I:\25223067.00\Deliverables\COLUMBIA DRY ADF - April 2023\Tables\[Table 2 - Historical Analytical Results with SSIs.xlsx]Table 2. Analy. Rslts- CCR

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – April 2023

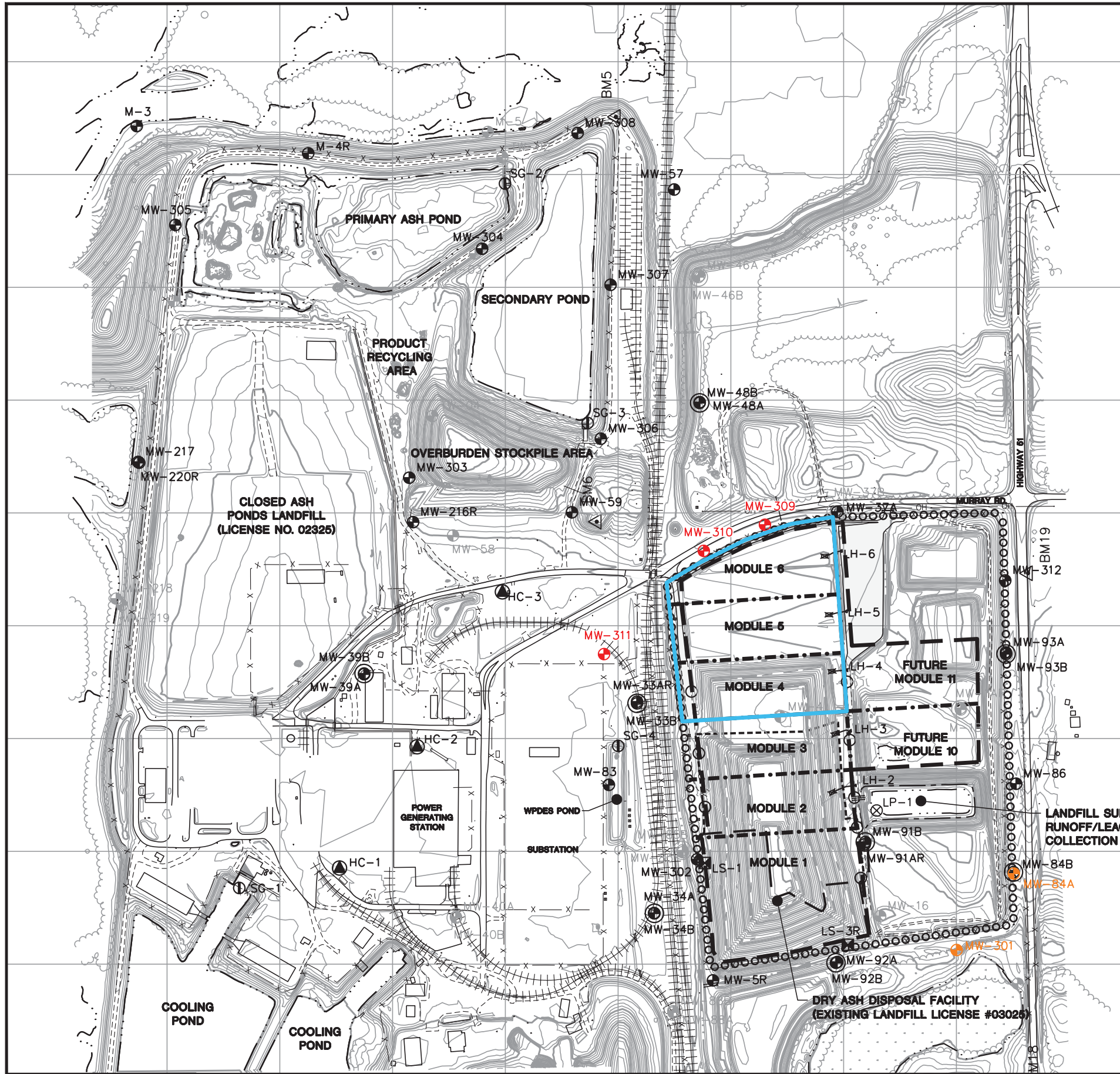


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



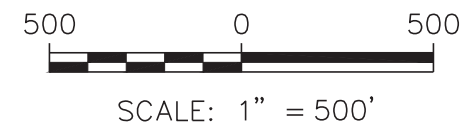
CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25220067.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
	DRAWN:	12/02/2019		CHECKED BY:	MDB			1
REVISED:	01/10/2020	APPROVED BY:	TK 04/10/2020					

I:\25220067.00\Drawings\ASD Mod 1-3 LF\Site Location Map.dwg, 4/12/2020 7:05:09 PM



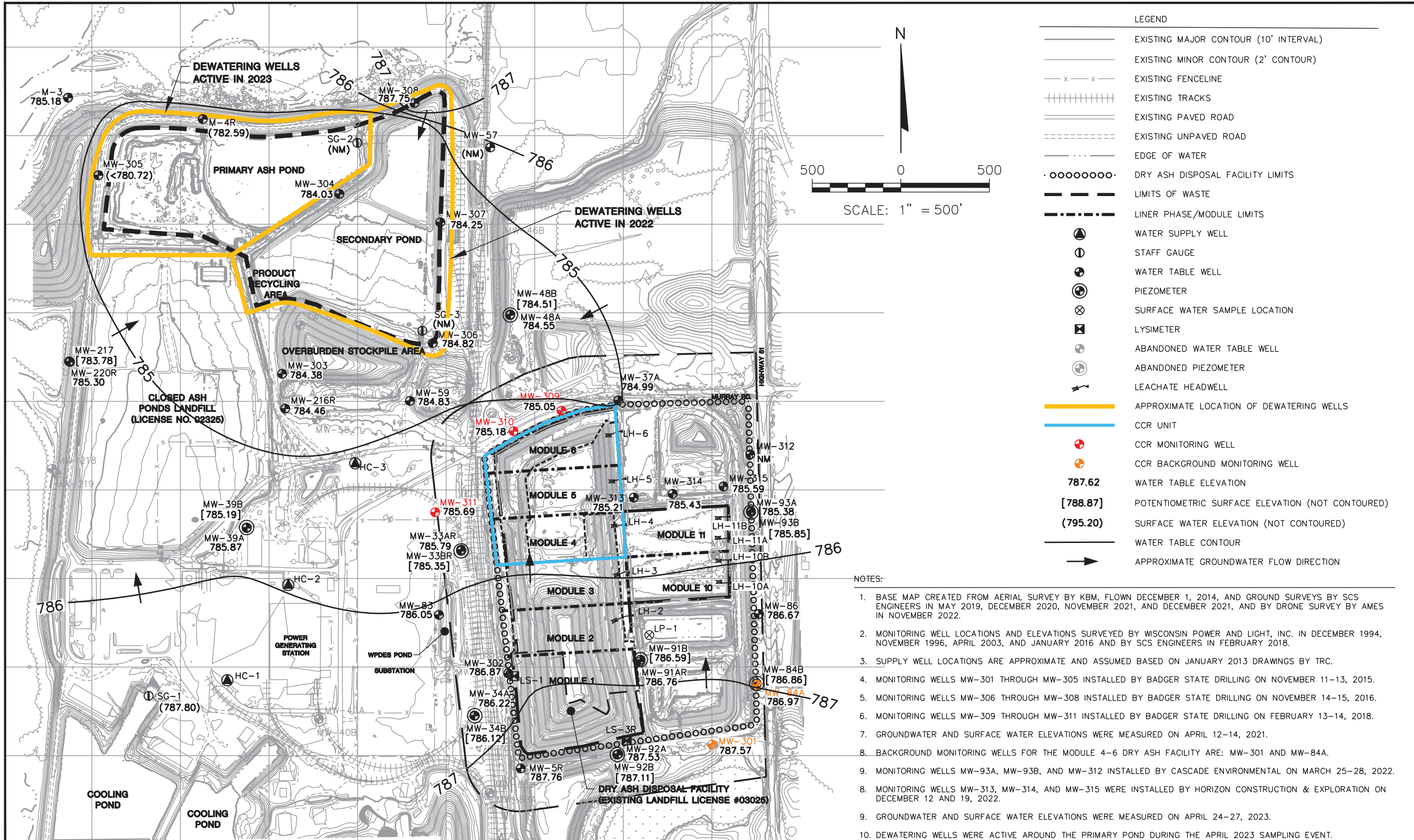
LEGEND	
	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
	DRY ASH DISPOSAL FACILITY LIMITS
	LIMITS OF WASTE
	LINER PHASE/MODULE LIMITS
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE 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 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. MONITORING WELLS MW-93A, MW-93B, AND MW-312 WERE INSTALLED BY CASCADE ENVIRONMENTAL ON MARCH 23-28, 2022.
 8. BACKGROUND MONITORING WELLS FOR THE MODULE 4-6 DRY ASH DISPOSAL FACILITY ARE: MW-301 AND MW-84A.



PROJECT NO. 25222067.00	DRAWN BY: KP	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	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	FIGURE 2
DRAWN: 12/02/2019	CHECKED BY: MDB				
REVISED: 01/16/2023	APPROVED BY: TK 5/30/2023				

I:\25222067.00\Drawings\Modules 4-6\Site Plan and Monitoring Well Locations Mod 4-6.dwg, 1/16/2023 3:06:53 PM



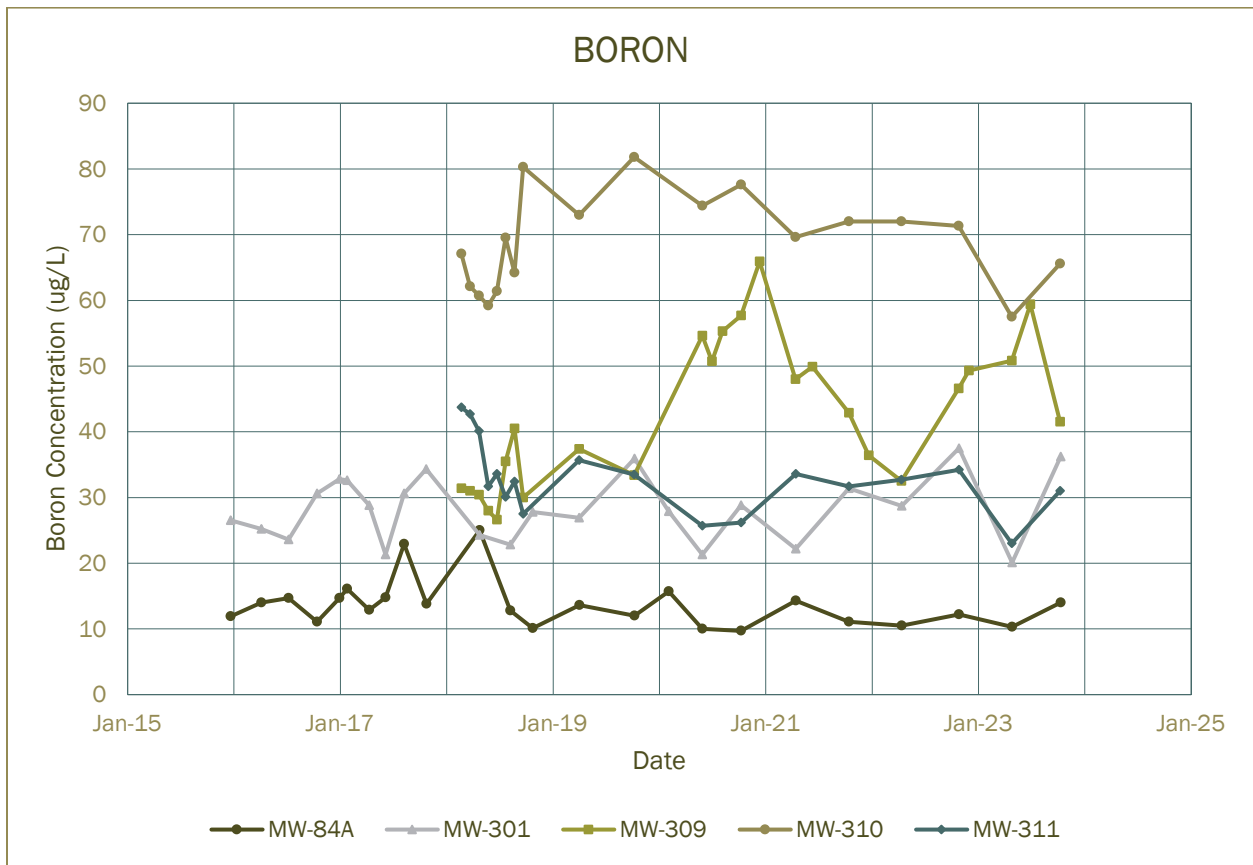
- LEGEND
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - x - x - EXISTING FENCELINE
 - ||||| EXISTING TRACKS
 - ==== EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EDGE OF WATER
 - DRY ASH DISPOSAL FACILITY LIMITS
 - LIMITS OF WASTE
 - LINER PHASE/MODULE LIMITS
 - ▲ WATER SUPPLY WELL
 - ⊕ STAFF GAUGE
 - ⊕ WATER TABLE WELL
 - ⊕ PIEZOMETER
 - ⊗ SURFACE WATER SAMPLE LOCATION
 - ⊗ LYSIMETER
 - ⊕ ABANDONED WATER TABLE WELL
 - ⊕ ABANDONED PIEZOMETER
 - ↖ LEACHATE HEADWELL
 - APPROXIMATE LOCATION OF DEWATERING WELLS
 - 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 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.
 10. DEWATERING WELLS WERE ACTIVE AROUND THE PRIMARY POND DURING THE APRIL 2023 SAMPLING EVENT.

PROJECT NO.	25223067.00	DRAWN BY:	KP		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
DRAWN:	10/12/2023	CHECKED BY:	RM					
REVISED:	11/10/2023	APPROVED BY:	TK 11/10/2023					

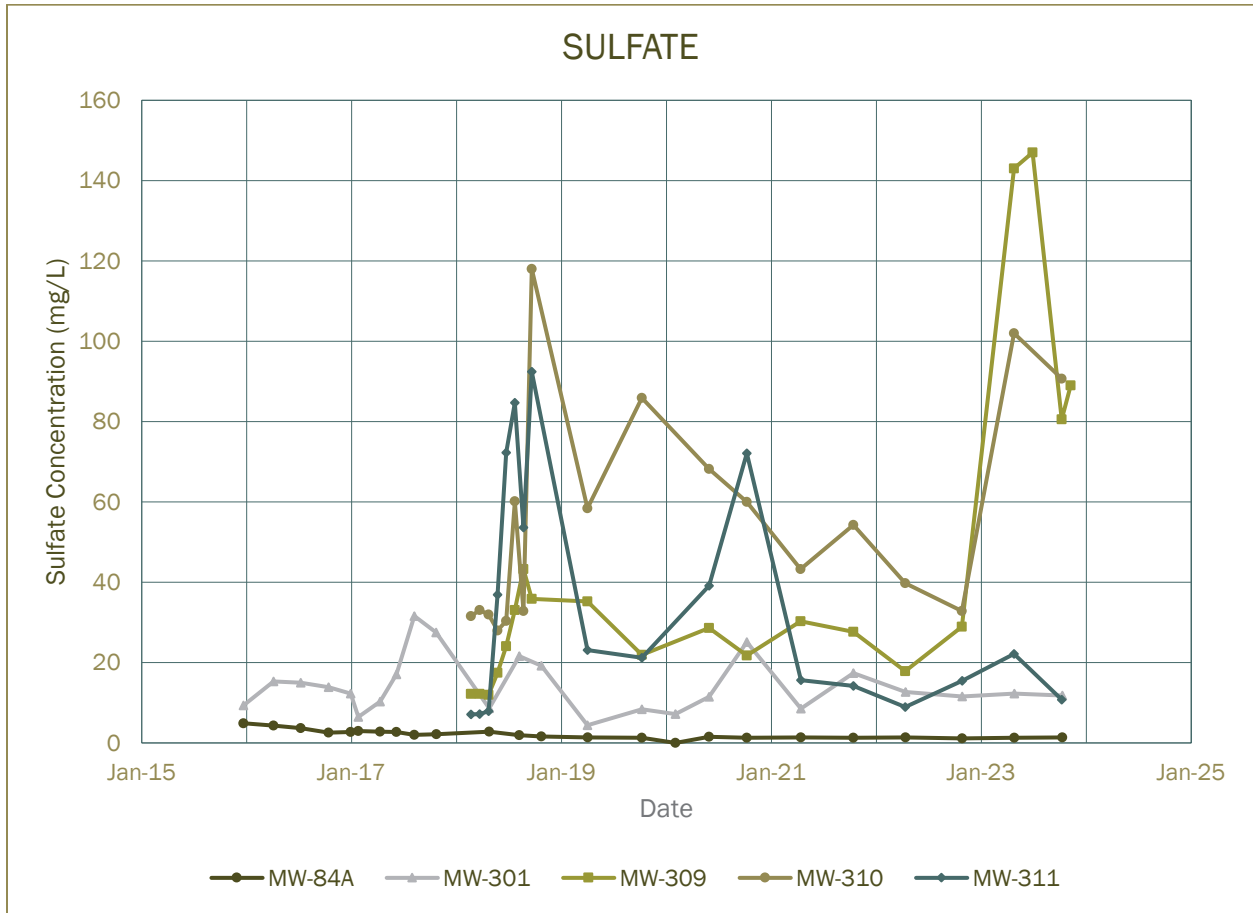
I:\25223067.00\Drawings\Module 4\Water Table Map-April 2023.dwg, 11/10/2023 3:30:31 PM

Appendix A
Trend Plots for CCR Wells

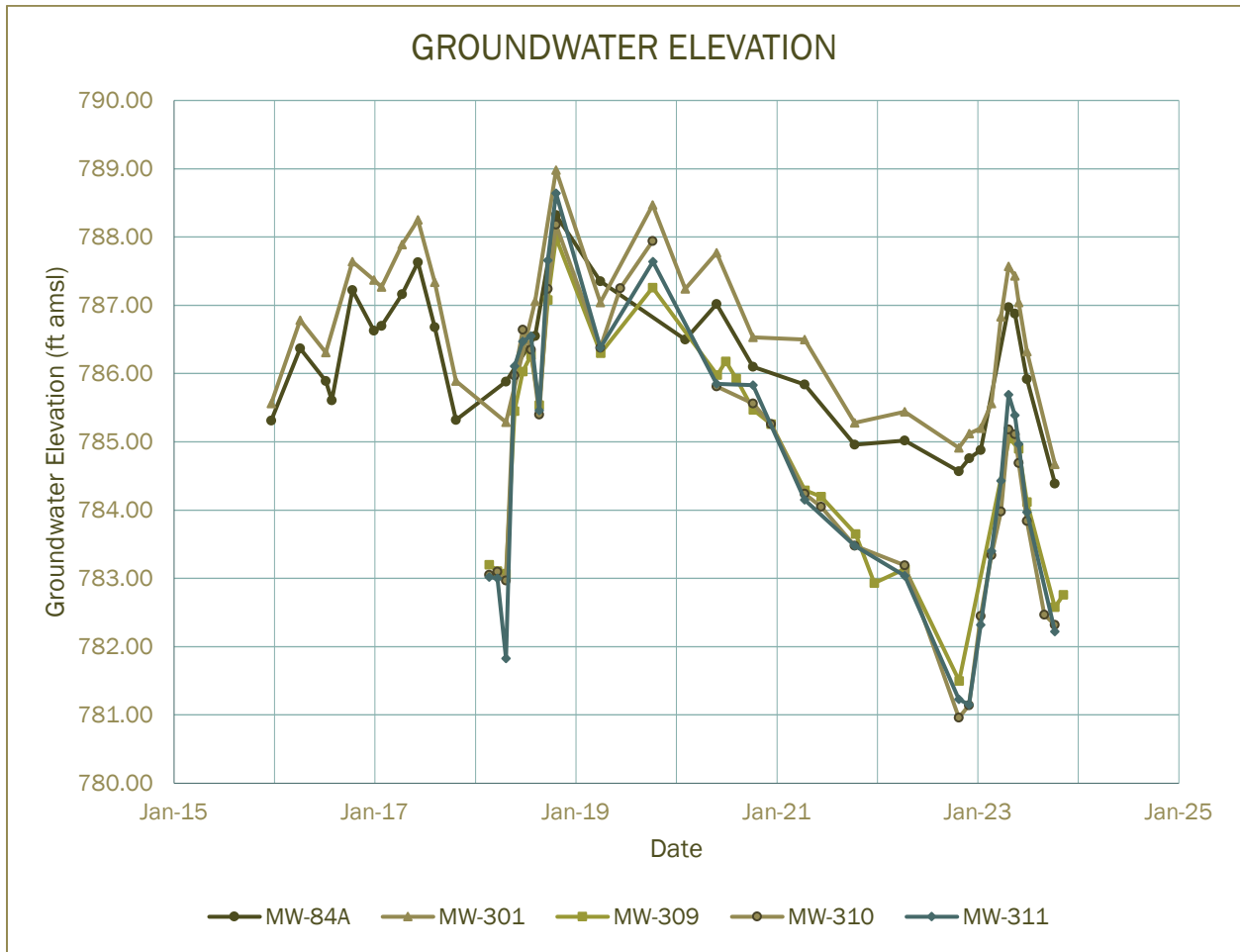
Trend Plots: Boron



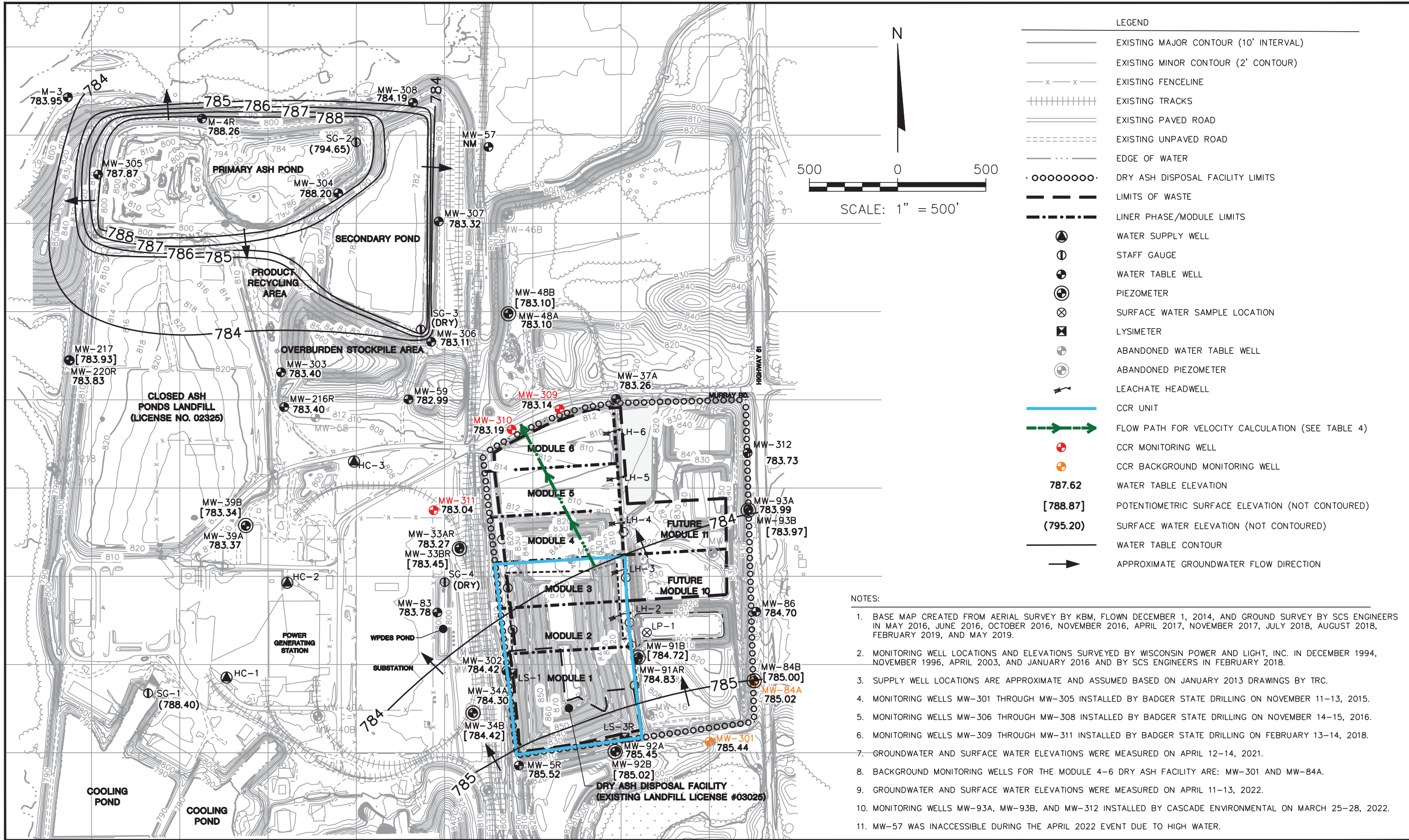
Trend Plots: Sulfate



Trend Plots: Groundwater Elevation



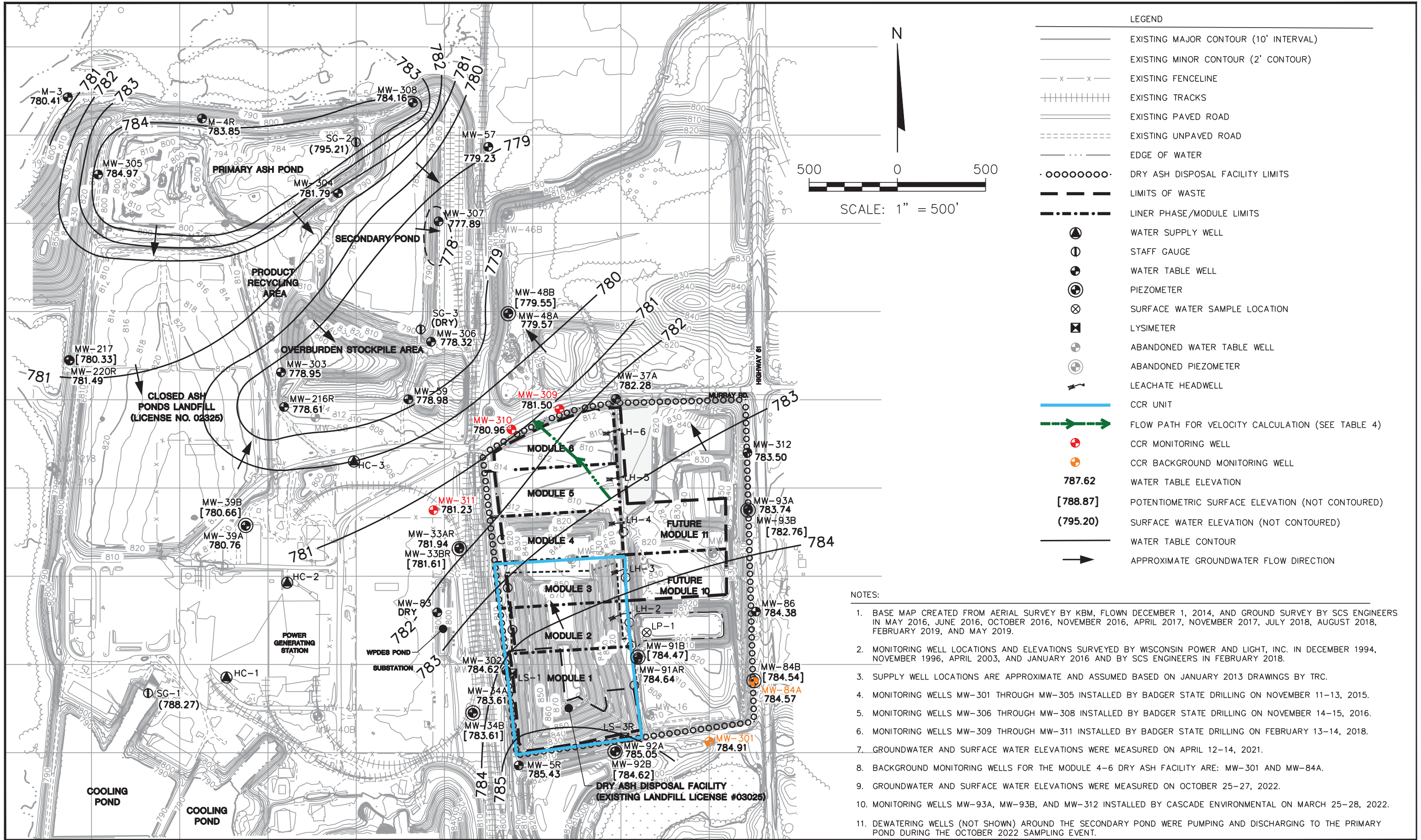
Appendix B
2022 Water Table Maps



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

PROJECT NO. 25222067.00	DRAWN BY: KP	 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 2022	FIGURE 3
DRAWN: 12/02/2019	CHECKED BY: MDB					
REVISED: 01/16/2023	APPROVED BY: TK, 1/16/2023					

I:\25222067.00\Drawings\Modules 4-6\Water Table Map-April 2022.dwg, 1/16/2023 2:43:07 PM



- 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
 - 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

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

PROJECT NO.	25222067.00	DRAWN BY:	KP
DRAWN:	12/15/2022	CHECKED BY:	MDB
REVISED:	12/30/2022	APPROVED BY:	TK, 1/16/2023

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

WATER TABLE MAP
 OCTOBER 2022

FIGURE
 4

I:\25222067.00\Drawings\Modules 4-6\Water Table Map-October 2022.dwg, 1/16/2023 2:40:42 PM

2023 Annual Groundwater Monitoring and Corrective Action Report

Columbia Energy Center
Dry Ash Disposal Facility, Modules 10 and 11
Pardeeville, Wisconsin

Prepared for:

Alliant Energy



SCS ENGINEERS

25223067.00 | January 31, 2024

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

OVERVIEW OF CURRENT STATUS

Columbia Energy Center, Dry Ash Disposal Facility, Modules 10 and 11 2023 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) unit. The groundwater monitoring system for the Columbia Energy Center (COL) Dry Ash Disposal Facility Modules 10 and 11 monitors a single CCR unit. 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;	Background sampling for detection monitoring
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	Not applicable – Data from the first round of detection monitoring will be included in 2024 annual report
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Not applicable – Site is in detection monitoring

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

Table of Contents

Section	Page
Overview of Current Status.....	i
1.0 Introduction.....	1
2.0 Background.....	1
2.1 Geologic and Hydrogeologic Setting.....	1
2.1.1 Regional Information.....	1
2.1.2 Site Information.....	2
2.2 CCR Rule Monitoring System.....	2
3.0 §257.90(e) Annual Report Requirements.....	2
3.1 §257.90(e)(1) Site Map.....	3
3.2 §257.90(e)(2) Monitoring System Changes.....	3
3.3 §257.90(e)(3) Summary of Sampling Events.....	3
3.4 §257.90(e)(4) Monitoring Transition Narrative.....	4
3.5 §257.90(e)(5) Other Requirements.....	4
3.5.1 § 257.90(e) General Requirements.....	4
3.5.2 §257.94(d) Alternative Detection Monitoring Frequency.....	5
3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring.....	5
3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency.....	5
3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards.....	5
3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring..	5
3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment.....	6
3.6 §257.90(e)(6) Overview.....	6
4.0 References.....	6

Tables

Table 1.	Groundwater Monitoring Well Network
Table 2.	CCR Rule Groundwater Samples Summary
Table 3.	Groundwater Elevation – State Monitoring Program and CCR Well Network
Table 4.	Horizontal Gradients and Flow Velocity
Table 5.	Groundwater Analytical Results Summary
Table 6.	Groundwater Field Data Summary

Figures

Figure 1.	Site Location Map
Figure 2.	Site Plan and Monitoring Well Locations
Figure 3.	Water Table Map – April 2023
Figure 4.	Water Table Map – October 2023

Appendices

- Appendix A Regional Hydrogeologic Information
- Appendix B Boring Logs and Well Construction Documentation
- Appendix C Laboratory Reports
- Appendix D Historical Monitoring Results

I:\25223067.00\Deliverables\2023 - Fed CCR Annual Report - COL Mod 10-11\240131_2023 Annual CCR GW Report
COL MOD 10-11 LF_Final.docx

1.0 INTRODUCTION

This 2023 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 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units. The site location is shown on **Figure 1**.

This report covers the period of groundwater monitoring from January 1, 2023, through December 31, 2023.

The groundwater monitoring system for the Columbia Energy Center (COL) Dry Ash Disposal Facility Modules 10 and 11 monitors a single CCR unit:

- COL Dry Ash Disposal Facility – Modules 10-11 (new CCR Landfill)

The system is designed to detect monitored constituents at the waste boundary of Modules 10 and 11 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 through 3 and Modules 4 through 6 of the COL Dry Ash Disposal Facility.

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 Modules 10 and 11. 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 Engineering, Inc., 1978). During drilling of CCR wells MW-301, MW-313, MW-314, and MW-315, the unconsolidated materials were identified as consisting primarily of silty sand and sand. Boring logs for previously installed monitoring well MW-84A show silty sand and sand as the primary unconsolidated materials at this location. The boring logs for Ash Disposal Facility Modules 10 and 11 CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated sand unit.

Shallow groundwater at the site generally flows to the north and west across the existing landfill area. The April 2023 water levels and apparent flow directions reflect the influence of a temporary dewatering system installed to lower groundwater levels in the area of the Primary Pond as part of the closure project for that CCR Unit. The water table elevations and groundwater flow directions for the April 2023 monitoring event are shown on **Figure 3**, and the water table elevations and groundwater flow directions for the October 2023 monitoring event are shown on **Figure 4**. 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**. Groundwater flow direction and velocity were not determined for the other background monitoring events because water levels were monitored only at the three new downgradient monitoring wells, which do not provide enough data for flow rate determination. The flow directions and rates in the Dry Ash disposal Facility have been relatively consistent over the last several years based on monitoring performed for the other CCR units.

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-313, MW-314, and MW-315. The CCR Rule wells are installed within the sand and gravel aquifer. Well depths range from approximately 26 to 43.5 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 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 Modules 10 and 11 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;

The monitoring system transitioned from background sampling to detection monitoring in 2023.

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;

Nine groundwater sampling events were conducted at COL Dry Ash Disposal Modules 10 and 11 in 2023. Eight background groundwater sampling events were completed in 2023 prior to the initiation of CCR disposal in Modules 10 and 11. The first detection monitoring event following groundwater monitoring system certification was completed in October 2023.

The monthly background monitoring events included the three new compliance wells installed at the waste boundary: MW-313, MW-314, and MW-315. Background has already been established for upgradient background wells MW-84A and MW-301, so additional background monitoring was not required for these two wells. These wells are also used as background wells for other CCR units and were sampled in April and October 2023 as part of the semiannual monitoring events for those units.

Background samples were analyzed for Appendix III and Appendix IV constituents. Groundwater samples collected during the first detection monitoring event in October 2023 were analyzed for Appendix III constituents. 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 2023 monitoring event data was in progress at the end of 2023 and will be transmitted to WPL in 2024; therefore, the October 2023 monitoring results and analytical report will be included in the 2024 annual report. The October 2023 groundwater elevation data is included in this report.

The sampling results for Appendix III and IV parameters from January to August 2023 are summarized in **Table 5**. Field parameter results for the January through August 2023 monthly

background sampling events are provided in **Table 6**. The analytical laboratory reports for January through August 2023 background events are provided in **Appendix C**. Historical results for each monitoring well through August 2023 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);

The COL Dry Ash Disposal Facility Modules 10 and 11 CCR Unit transitioned from background monitoring to detection monitoring. The groundwater monitoring system for Modules 10 and 11 was certified on June 15, 2023.

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 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

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. Monthly background sampling occurred from January through August 2023. The groundwater monitoring and corrective action program transitioned to detection monitoring in October 2023.

Summary of Key Actions Completed.

- Eight rounds of monthly background sampling (January to August 2023).
- Certification of groundwater monitoring well network.
- One semiannual groundwater sampling and analysis event (October 2023).

Description of Any Problems Encountered. No problems were encountered at Mod 10-11 in 2023.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2024).

- Statistical evaluation and determination of any SSIs for the October 2023 and April 2024 monitoring events.

- If an SSI is determined, then within 90 days either:
 - Complete ASD (if applicable), or
 - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2024).

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.

Not applicable. No alternative source demonstrations were completed in 2023.

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.

Tables

- 1 Groundwater Monitoring Well Network
- 2 CCR Rule Groundwater Samples Summary
- 3 Groundwater Elevation – State Monitoring Program
and CCR Well Network
- 4 Horizontal Gradients and Flow Velocity
- 5 Groundwater Analytical Results Summary
- 6 Groundwater Field Data Summary

**Table 1. Groundwater Monitoring Well Network
Columbia Energy Center - Dry Ash Disposal Facility - Modules 10-11
SCS Engineers Project #25223067.00**

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-84A	Upgradient	Background
MW-301	Upgradient	Background
MW-313	Downgradient	Compliance
MW-314	Downgradient	Compliance
MW-315	Downgradient	Compliance

Created by: NLB
 Last revision by: NLB
 Checked by: BLR

Date: 12/1/2023
 Date: 12/1/2023
 Date: 12/7/2023

**Table 2. Groundwater Samples Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 10-11
SCS Engineers Project #25223067.00**

Sample Dates	Downgradient Wells			Background Wells	
	MW-313	MW-314	MW-315	MW-84A	MW-301
January 24, 2023	B	B	B	--	--
February 23, 2023	B	B	B	--	--
March 27, 2023	B	B	B	--	--
April 24-27, 2023	B	B	B	B	B
May 30, 2023	B	B	B	--	--
June 29, 2023	B	B	B	--	--
July 31, 2023	B	B	B	--	--
August 31, 2023	B	B	B	--	--
October 9-11, 2023	D	D	D	D	D
Total Samples	9	9	9	2	2

Abbreviations:

B = Background Monitoring Event

D = Detection Monitoring Event

-- = Not Sampled

Created by: NLB

Date: 12/1/2023

Last revision by: BR

Date: 12/8/2023

Checked by: RM

Date: 12/13/2023

**Table 3. Groundwater Elevation - State Monitoring Program and CCR Well Network
Columbia Dry Ash and Ash Pond Disposal Facilities / SCS Engineers Project #25223067.00**

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)																			
	Screen Length (ft)																			
	Total Depth (ft from top of casing)																			
	Top of Well Screen Elevation (ft)																			
Measurement Date																				
Dry Ash Facility (Facility ID #03025)	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)																			
	Total Depth (ft from top of casing)																			
	Top of Well Screen Elevation (ft)																			
	Measurement Date																			
	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	
																	10	5	10	
	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	
	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	NI	NI	NI
	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	

Well Number	M-3	M-4R	MW-39A	MW-39B	MW-48A	MW-48B	MW-57	MW-59	MW-216R	MW-217	MW-220RR	
	Top of Casing Elevation (feet amsl)											
	Screen Length (ft)											
	Total Depth (ft from top of casing)											
	Top of Well Screen Elevation (ft)											
Measurement Date												
Ash Pond Facility (Facility ID #02325)	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)											
	Top of Well Screen Elevation (ft)											
	Measurement Date											
	788.23	806.10	809.62	809.50	828.86	828.84	786.29	815.48	814.21	791.55	792.90	
	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	783.39	782.27	782.36	
	October 15, 2013	NM	NM	782.94	782.81	NM	NM	782.47	783.49	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
	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 #25223067.00**

	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																					
CCR Rule Wells (cont.)	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	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	NI	
	July 28, 2016	NM	NM	784.35	NM	NM	NM	NM	784.86	785.61	--	--	--	--	--	NI	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	NI	
	December 29, 2016	787.37	787.05	NM	NM	NM	NM	NM	785.66	785.72	786.63	--	--	--	--	--	NI	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	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	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	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	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	NI
	February 21, 2018	NM	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	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	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	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	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	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	NI
	August 22, 2018	NM	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	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	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	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	NI
	June 19, 2019	NM	NM	786.81	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI
	October 7-9, 2019	788.47	788.31	787.02	790.41	790.36	790.65	NM	NM	787.47	786.99	787.18	787.26	787.94	787.64	NI	NI	NI	NI	NI	NI	NI
	December 13, 2019	--	--	--	--	--	--	--	--	--	787.03	785.68	786.43	--	--	--	NI	NI	NI	NI	NI	NI
	December 23, 2019	--	--	--	--	--	--	--	--	--	--	--	--	--	775.22	--	NI	NI	NI	NI	NI	NI
	January 17, 2020	--	--	785.58	--	--	--	--	--	--	--	--	--	--	--	--	NI	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	NI	
December 2, 2022	785.12	784.48	NM	783.97	NM	NM	NM	781.91	783.71	784.76	778.52	779.54	NM	NM	NM	NI	NI	NI	NI	NI	NI	
January 12-13, 2023	785.20	784.55	NM	NM	NM	NM	NM	782.75	784.10	784.88	NM	NM	782.57	782.45	782.32	NI	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	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	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	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	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	NI	
May 5, 2023	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.55	NM	NM	NM	NM	780.49	780.49	
May 16, 2023	787.43	787.07	783.88	784.12	dry	781.64																

**Table 4. Horizontal Gradients and Flow Velocity
Columbia Energy Center - MOD 10-11
SCS Engineers Project #25223067.00
January - December 2023**

Sampling Dates	Flow Path A - Northwest				
	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
4/24-27/2023	787.57	785.43	1430	0.0015	0.018
10/9-11/2023	784.67	783.33	1428	0.0009	0.0115

Wells	K Values (cm/sec)	K Values (ft/d)	Assumed Porosity, n
MW-313	1.80E-03	5.10	
MW-314	2.20E-03	6.24	
MW-315	1.30E-03	3.69	
Geometric	1.73E-03	4.89	

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

ft = feet

ft/d = feet per day

K = hydraulic conductivity

n = effective porosity

V = groundwater flow velocity

h1, h2 = point interpreted groundwater elevation at locations 1 and 2

Δl = distance between location 1 and 2

Δh/Δl = hydraulic gradient

Note:

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

Created by: NLB
Last revision by: RM
Checked by: NLB

Date: 12/1/2023
Date: 1/2/2024
Date: 1/2/2024

Table 5. Groundwater Analytical Results Summary - 2023
Columbia Energy Center Dry Ash Disposal Facility - Modules 10-11 / SCS Engineers Project #25223067.00

Parameter Name	UPL Method	UPL	Background Wells		Compliance Wells									
			MW-84A	MW-301	MW-313									
			4/27/2023	4/27/2023	1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023		
Groundwater Elevation (ft amsl)			786.97	787.57	783.36	783.59	784.12	785.21	785.24	784.67	783.96	783.55		
Appendix III														
Boron, µg/L	NA	NA	10.3	20.1	25.1	46.6	67.1	108	191	189	97.1	62.3		
Calcium, µg/L	NA	NA	68,600	120,000	66800	62900	63300 P6	63,900	69100	71900	70000	68600		
Chloride, mg/L	NA	NA	3.0	1.5 J	1.4 J	<0.43	1.3 J	2.3	10.0	22.8	27.0	34.3		
Fluoride, mg/L	NA	NA	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.61	0.19 J	<0.095	<0.095		
Field pH, Std. Units	NA	NA	7.01	6.65	7.43	7.35	7.40	7.06	7.55	7.41	7.40	7.25		
Sulfate, mg/L	NA	NA	1.3 J	12.3	5.7	7.1	8.7	11.0	16.5	19.9	15.4	12.7		
Total Dissolved Solids, mg/L	NA	NA	326	526	298	278	320	318	334	408	354	354		
Appendix IV														
		UPL	GPS											
Antimony, ug/L	NA	NA	NA	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic, ug/L	NA	NA	NA	<0.28	<0.28	<0.28	0.35 J	<0.28	<0.28	<0.28	<0.28	0.34 J	<0.28	
Barium, ug/L	NA	NA	NA	12.6	9.8	70.5	55.9	47.3	44.3	--	47.0	38.9	36.7	
Beryllium, ug/L	NA	NA	NA	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	
Cadmium, ug/L	NA	NA	NA	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Chromium, ug/L	NA	NA	NA	1.7 J	<1.0	5.2	<1.0	<1.0	1.2 J	1.2 J	1.4 J	1.3 J	1.3 J	
Cobalt, ug/L	NA	NA	NA	<0.12	<0.12	0.40 J	0.16 J	<0.12	<0.12	<0.12	<0.12	0.18 J	<0.12	
Fluoride, mg/L	NA	NA	NA	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.61	0.19 J	<0.095	<0.095	
Lead, ug/L	NA	NA	NA	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	
Lithium, ug/L	NA	NA	NA	0.71 J	0.62 J	0.75 J	0.46 J	0.46 J	0.67 J	0.68 J	1.0 B	0.82 J	0.75 J, B	
Mercury, ug/L	NA	NA	NA	<0.066	<0.066 M0	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066 1q	<0.066	<0.066	
Molybdenum, ug/L	NA	NA	NA	<0.44	<0.44	4.3	2.0	1.4 J	1.3 J	1.5	1.3 J	1.1 J	0.63 J	
Selenium, ug/L	NA	NA	NA	<0.32	<0.32	0.41 J	0.55 J	0.49 J	0.58 J	0.59 J	0.65 J	0.64 J	0.74 J	
Thallium, ug/L	NA	NA	NA	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.21 J	<0.14	<0.14	<0.14	
Radium 226/228 Combined, pCi/L	NA	NA	NA	0.326	0.417	0.345	0.346	0.000	0.677	0.0341	0.350	0.894	0.217	

Abbreviations:

mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase
-- = Not Measured
NA = Not applicable

GPS = Groundwater Protection Standard
UPL = Upper Prediction Limit
NP = Nonparametric UPL with 1-of-2 retesting
P = Parametric UPL with 1-of-2 retesting

LOD = Limit of Detection
LOQ = Limit of Quantitation
DQ = Double Quantification

J = Estimated concentration at or above the LOD and below the LOQ.
B = Analyte was detected in the associated method blank.
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.
R1 = RPD value was outside control limits.
1q = Analyte was measured in the associated method blank at a concentration of -0.10µg/L.

Notes:

1. UPLs and GPSs are not applied to analytical results for background data presented in this table.

Table 5. Groundwater Analytical Results Summary - 2023
Columbia Energy Center Dry Ash Disposal Facility - Modules 10-11 / SCS Engineers Project #25223067.00

Parameter Name	UPL Method	UPL	Compliance Wells															
			MW-314								MW-315							
			1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023	1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023
Groundwater Elevation (ft amsl)			783.63	783.82	784.41	785.43	785.55	784.95	784.26	783.83	783.77	783.96	784.57	785.59	785.77	785.17	784.49	783.97
Appendix III																		
Boron, µg/L	NA	NA	14.2	13.0	15.2	15.5	16.9	15.4	12.4	13.0	11.7	9.3 J	11.9	12.0	13.6	13.3	12.3	12.6
Calcium, µg/L	NA	NA	95000	96200	99300	92,400	102,000	103,000	109,000	109,000	107,000	100,000	106,000	101,000	108,000	110,000	121,000	125,000
Chloride, mg/L	NA	NA	1.8 J	2.2	2.6 M0, R1	3.2	2.3	2.4	3.0	3.1	4.9	5.6	6.0	5.3	3.9	3.3	3.2	3.1
Fluoride, mg/L	NA	NA	<0.095	<0.095	<0.095 M0, R1	<0.095	<0.095	<0.095	0.62	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH, Std. Units	NA	NA	7.23	7.23	7.25	7.21	7.34	7.20	7.45	7.12	7.13	7.16	7.21	7.18	7.34	7.13	6.97	6.91
Sulfate, mg/L	NA	NA	4.2	4.2	5.0 M0, R1	4.6	3.4	3.2	3.9	4.0	9.2	8.7	10.7	10.1	8.8	7.0	5.2	4.3
Total Dissolved Solids, mg/L	NA	NA	380	396	412	418	444	470	464	464	436	448	480	452	456	482	486	526
Appendix IV																		
Antimony, ug/L	NA	NA	NA	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic, ug/L	NA	NA	NA	<0.28	0.41 J	<0.28	<0.28	<0.28	<0.28	0.32 J	<0.28	<0.28	0.49 J	0.45 J	0.39 J	0.37 J	0.38 J	<0.28
Barium, ug/L	NA	NA	NA	48.7	43.4	43.3	42.7	46.0	41.3	34.9	33.2	46.4	36.6	31.7	47.7	52.7	50.4	48.5
Beryllium, ug/L	NA	NA	NA	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium, ug/L	NA	NA	NA	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
Chromium, ug/L	NA	NA	NA	<1.0	1.0 J	<1.0	1.1 J	<1.0	<1.0	1.1 J	1.1 J	1.2 J	1.7 J	1.8 J	1.9 J	1.7 J	1.6 J	1.4 J
Cobalt, ug/L	NA	NA	NA	0.31 J	0.22 J	<0.12	<0.12	0.14 J	<0.12	<0.12	0.24 J	0.12 J	0.13 J	<0.12	0.22 J	0.21 J	<0.12	<0.24
Fluoride, mg/L	NA	NA	NA	<0.095	<0.095	<0.095 M0, R1	<0.95	<0.095	<0.095	0.62	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Lead, ug/L	NA	NA	NA	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	0.32 J	<0.24
Lithium, ug/L	NA	NA	NA	0.33 J	0.58 J	0.69 J	0.40 J	0.34 J	0.94 J, B	0.71 J	0.66 J	0.62 J	0.73 J	0.85 J	0.80 J	0.45 J	1.2 B	0.75 J
Mercury, ug/L	NA	NA	NA	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	1q	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	1q	<0.066
Molybdenum, ug/L	NA	NA	NA	1.7	1.4 J	1.5 J	1.5	1.7	1.3 J	0.87 J	0.8 J	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium, ug/L	NA	NA	NA	<0.32	<0.32	<0.32	<0.32	1.7	<0.32	<0.32	<0.32	0.40 J	0.52 J	0.41 J	<0.32	0.36 J	0.58 J	<0.32
Thallium, ug/L	NA	NA	NA	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Radium 226/228 Combined, pCi/L	NA	NA	NA	0.436	0.247	0.666	0.000	0.162	0.422	0.359	0.371	0.351	0.373	0.385	0.257	0.666	0.464	1.35

Abbreviations:

mg/L = milligrams per liter
µg/L = micrograms per liter
SSI = Statistically Significant Increase
-- = Not Measured
NA = Not applicable

GPS = Groundwater Protection Standard
UPL = Upper Prediction Limit
NP = Nonparametric UPL with 1-of-2 retesting
P = Parametric UPL with 1-of-2 retesting

LOD = Limit of Detection
LOQ = Limit of Quantitation
DQ = Double Quantification

J = Estimated concentration at or above the LOD and below the LOQ.
B = Analyte was detected in the associated method blank.
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.
R1 = RPD value was outside control limits.
1q = Analyte was measured in the associated method blank at a concentration of -0.10ug/L.

Notes:

1. UPLs and GPSs are not applied to analytical results for background data presented in this table.

Created by: NLB Date: 12/6/2023
Last revision by: RM Date: 12/14/2023
Checked by: NLB Date: 12/15/2023
Scientist/Proj Mgr QA/QC: TK Date: 1/4/2024

Table 6. Groundwater Field Data Summary
Columbia Energy Center - Dry Ash Disposal Facility - Modules 10-11
SCS Engineers Project #25223067.00

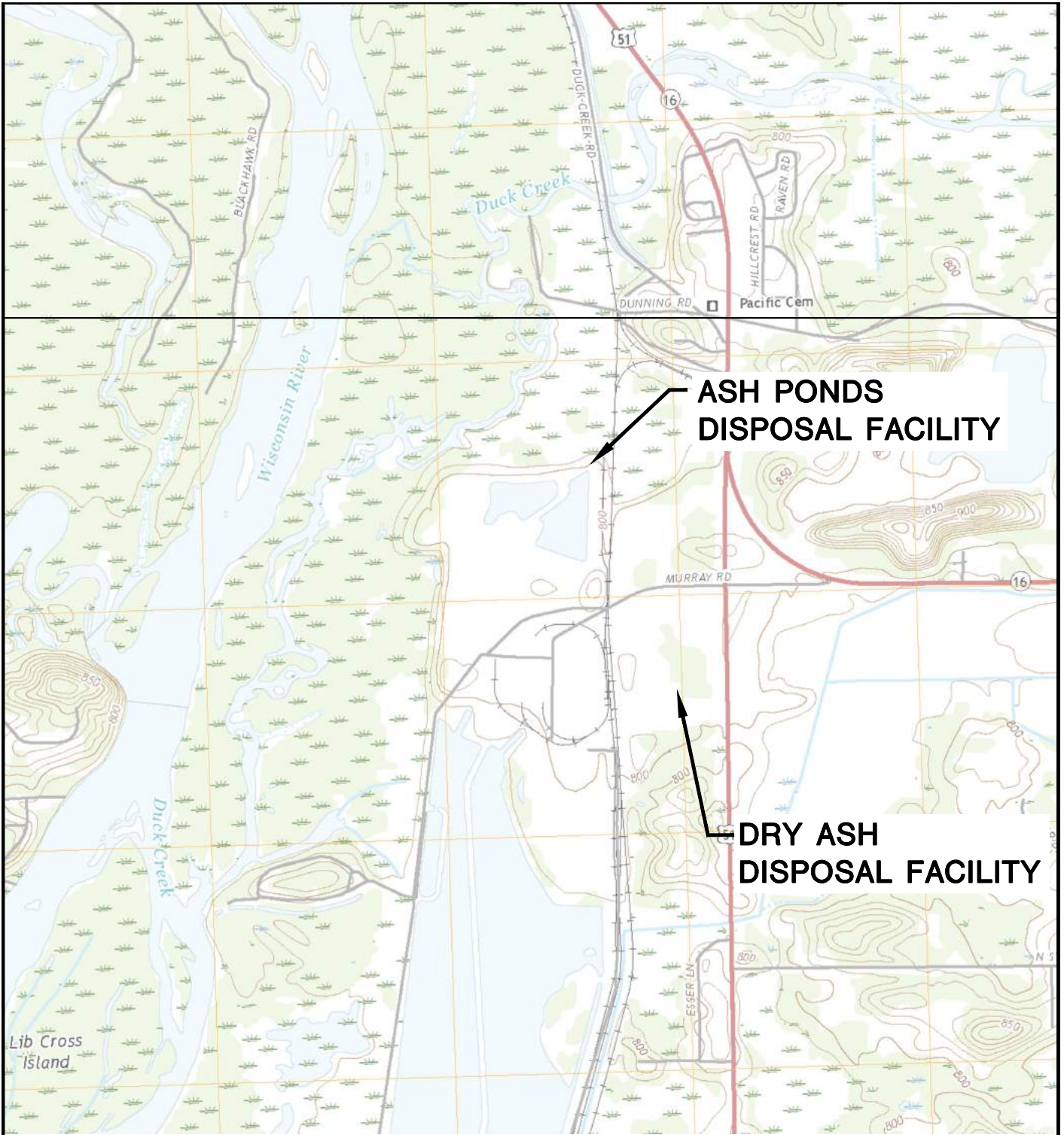
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-84A	4/27/2023	786.97	10.7	7.01	9.37	557	103	0.72
MW-301	4/27/2023	787.57	8.0	6.65	6.50	857	95	0.00
MW-313	1/24/2023	783.36	9.4	7.43	4.08	510	87	0.00
	2/23/2023	783.59	10.0	7.35	5.51	558	57	1.25
	3/27/2023	784.12	10.0	7.40	7.03	491	52	0.00
	4/26/2023	785.21	10.1	7.06	7.96	553	103	1.02
	5/30/2023	785.24	10.4	7.55	7.38	521	177	2.52
	6/29/2023	784.67	11.2	7.41	7.17	632	249	0.00
	7/31/2023	783.96	10.9	7.40	8.16	623	240	0.00
	8/31/2023	783.55	11.2	7.25	9.50	658	152	0.00
MW-314	1/24/2023	783.63	10.3	7.23	6.21	655	78	7.30
	2/23/2023	783.82	9.9	7.23	5.80	804	125	2.62
	3/27/2023	784.41	10.0	7.25	5.51	667	46	0.00
	4/26/2023	785.43	10.0	7.21	6.15	735	122	1.80
	5/30/2023	785.55	10.4	7.34	6.46	675	168	1.21
	6/29/2023	784.95	11.0	7.20	6.53	807	259	0.00
	7/31/2023	784.26	11.0	7.45	7.65	862	158	0.83
	8/31/2023	783.83	11.3	7.12	9.39	839	295	1.55
MW-315	1/24/2023	783.77	10.5	7.13	7.65	748	38	6.43
	2/23/2023	783.96	10.0	7.16	7.28	892	118	2.70
	3/27/2023	784.57	10.1	7.21	7.83	711	46	0.00
	4/26/2023	785.59	10.3	7.18	8.46	776	123	2.66
	5/30/2023	785.77	10.8	7.34	7.02	716	116	2.83
	6/29/2023	785.17	11.0	7.13	5.40	834	231	0.00
	7/31/2023	784.49	11.1	6.97	4.17	876	233	0.00
	8/31/2023	783.97	11.4	6.91	4.62	926	279	2.38

Created by: RM
 Last revision by: BLR
 Checked by: RM

Date: 9/2/2022
 Date: 12/8/2023
 Date: 12/13/2023

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map – April 2023
- 4 Water Table Map – October 2023

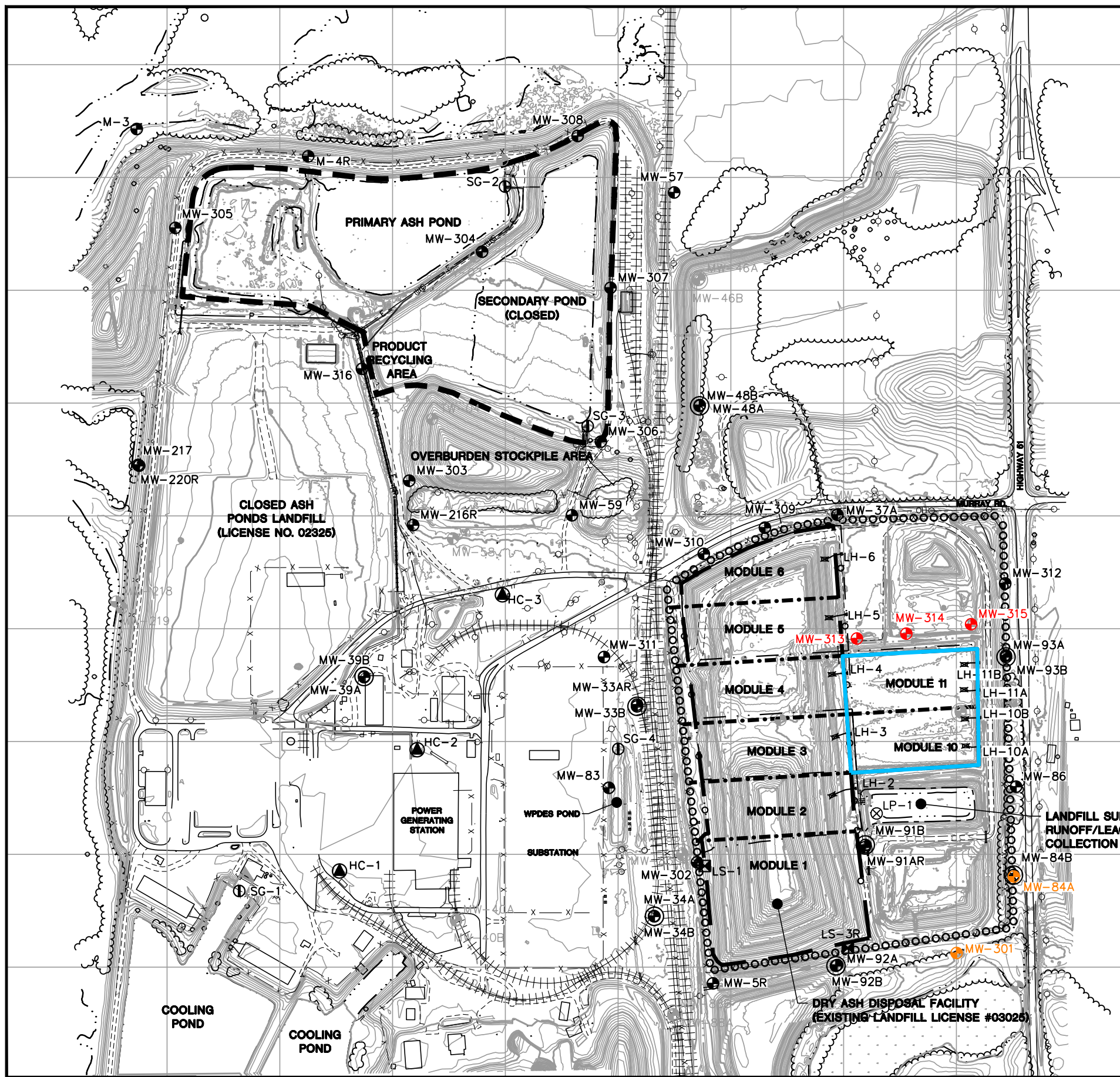


POYNETTE QUADRANGLE
 WISCONSIN-COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



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

I:\25219067.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:38:21 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 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. BACKGROUND MONITORING WELLS FOR THE MODULE 10-11 DRY ASH FACILITY ARE: MW-301 AND MW-84A.

PROJECT NO.	25223067.00	DRAWN BY:	KP
DRAWN:	12/02/2019	CHECKED BY:	RM
REVISED:	01/09/2024	APPROVED BY:	TK1/10/2024

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

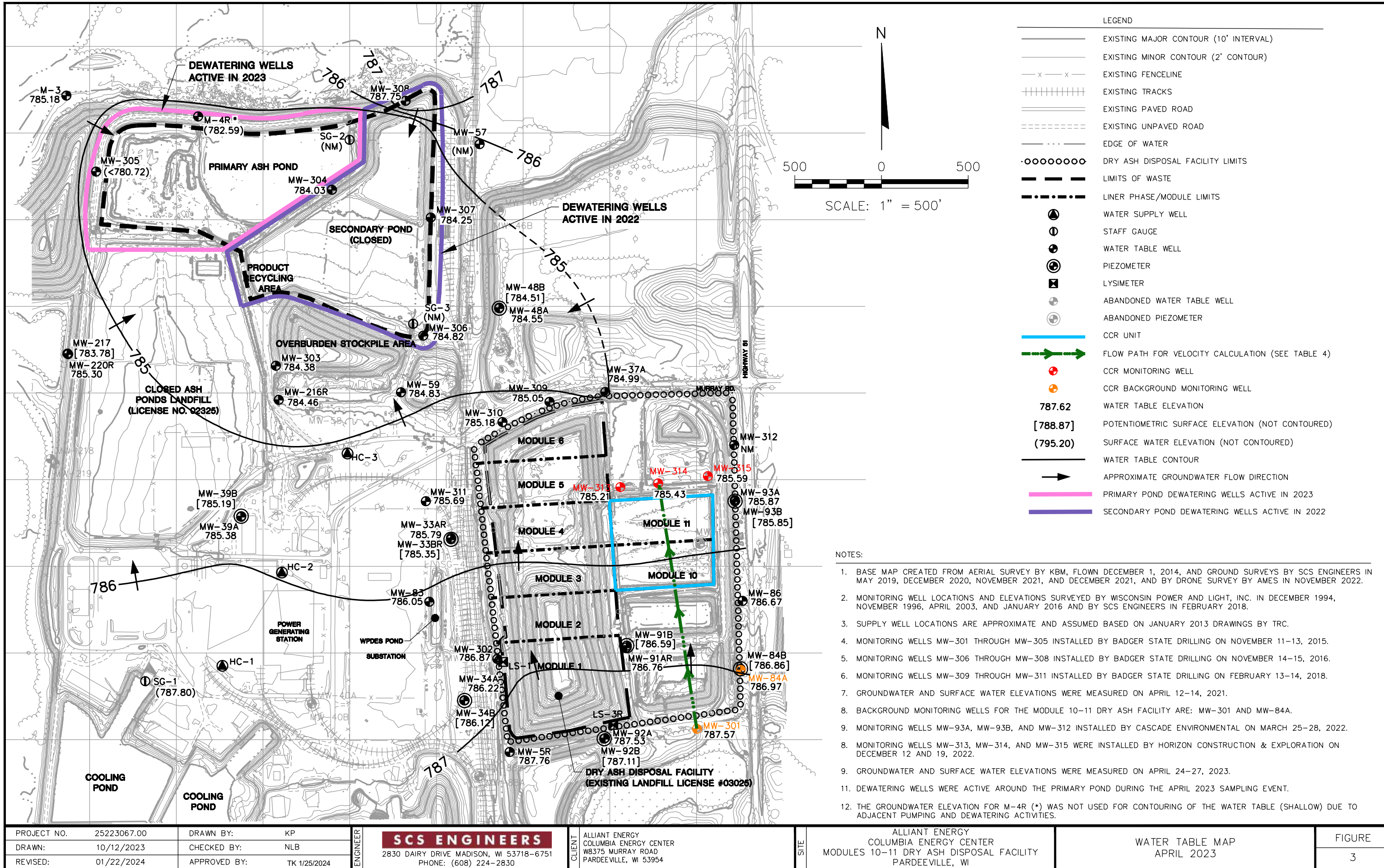
CLIENT
 ALLIANT ENERGY
 COLUMBIA ENERGY CENTER
 W8375 MURRAY ROAD
 PARDEEVILLE, WI 53954

SITE
 ALLIANT ENERGY
 COLUMBIA ENERGY CENTER
 MODULES 10-11 DRY ASH DISPOSAL FACILITY
 PARDEEVILLE, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE
 2

I:\25223067.00\Drawings\Modules 10-11\Site Plan and Monitoring Well Locations.dwg, 1/9/2024 10:16:13 AM



PROJECT NO.	25223067.00	DRAWN BY:	KP
DRAWN:	10/12/2023	CHECKED BY:	NLB
REVISED:	01/22/2024	APPROVED BY:	TK 1/25/2024

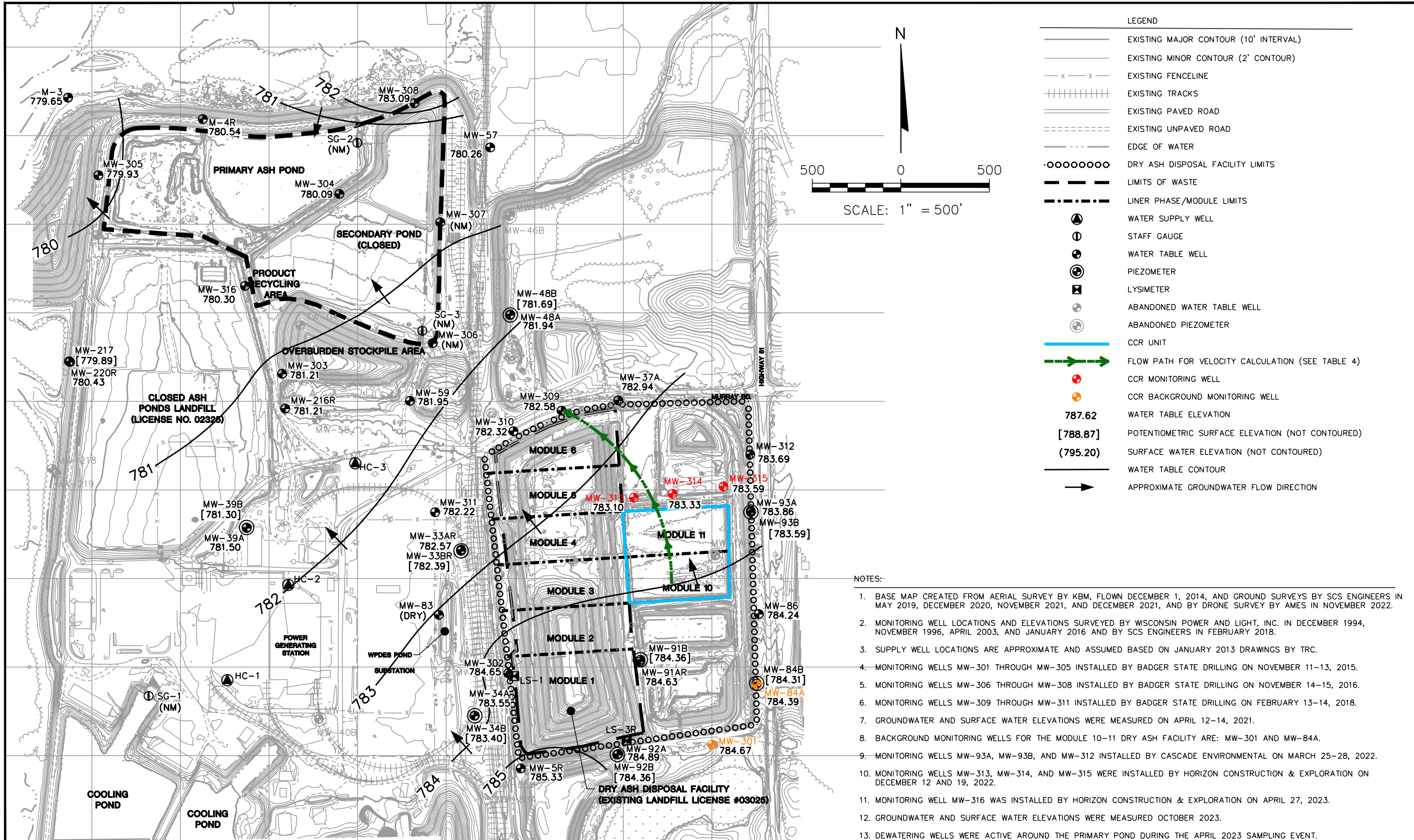
SCS ENGINEERS
 2830 DAIRY DRIVE MADISON, WI 53718-6751
 PHONE: (608) 224-2830

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

SITE: ALLIANT ENERGY
 COLUMBIA ENERGY CENTER
 MODULES 10-11 DRY ASH DISPOSAL FACILITY
 PARDEEVILLE, WI


WATER TABLE MAP
 APRIL 2023

FIGURE
 3



PROJECT NO. 25223067.00	DRAWN BY: KP	 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 10-11 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI	WATER TABLE MAP OCTOBER 2023	FIGURE 4
DRAWN: 11/13/2023	CHECKED BY: NLB					
REVISED: 01/09/2024	APPROVED BY: TK1/10/2024					

I:\25223067.00\Drawings\Modules 10-11\Water Table Map-October 2023.dwg, 1/9/2024 10:22:34 AM



Appendix A

Regional Hydrogeologic Information

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

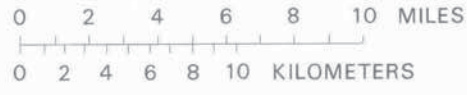
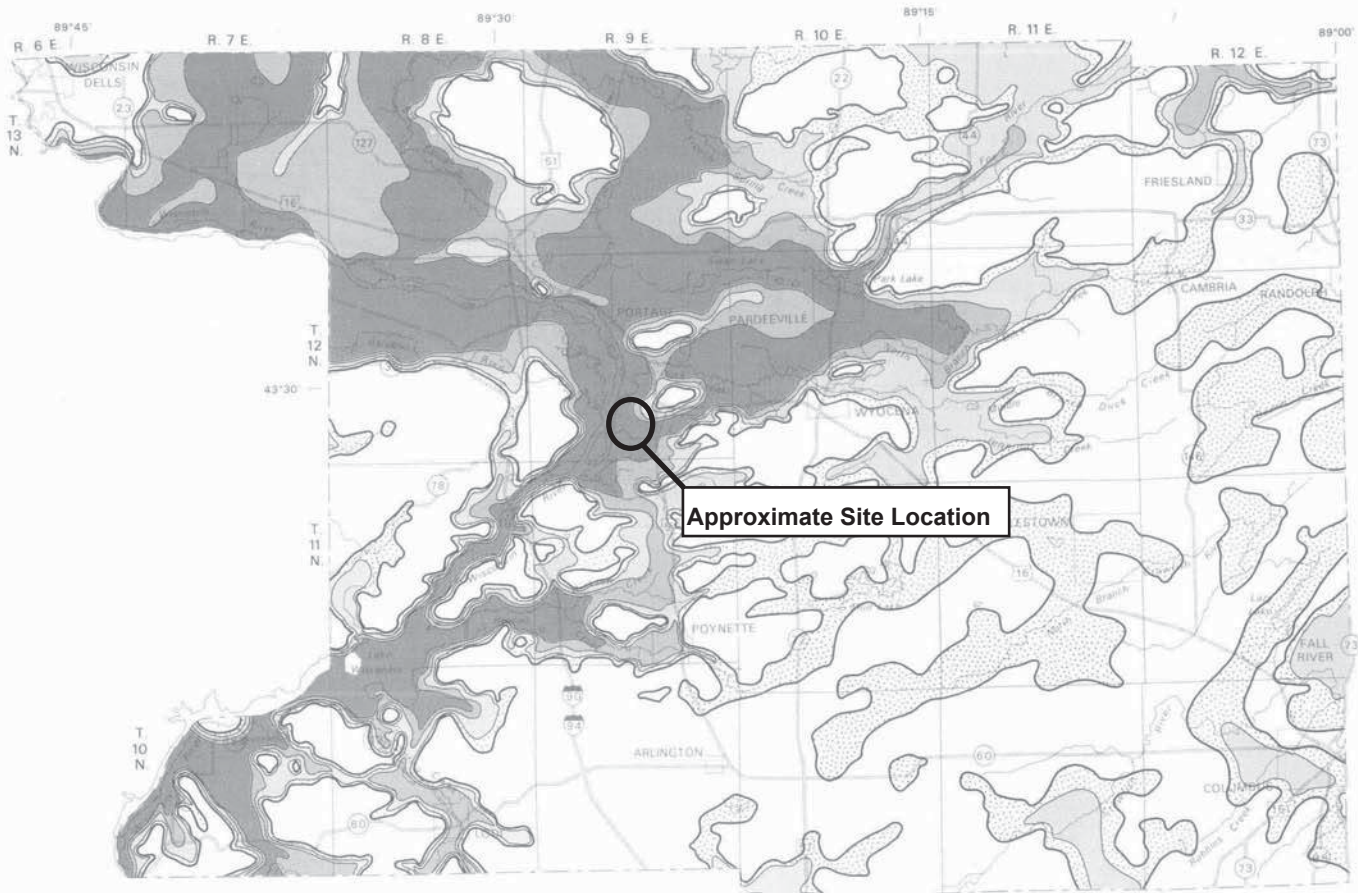
Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	<ul style="list-style-type: none"> Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic matter
Ordovician (460 to 490 million years old)	Sandstone Aquifer	0 to 800+	Galena Decorah Platteville St. Peter Prairie du Chien	<ul style="list-style-type: none"> Dolomite and shaley dolomite Sandstone
Cambrian (490 to 500 million years old)			Trempeleau Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> Sandstone
Precambrian (more than 1 billion years old)	Used for domestic supply in some areas	--	Precambrian	<ul style="list-style-type: none"> 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



EXPLANATION

Probable well yields

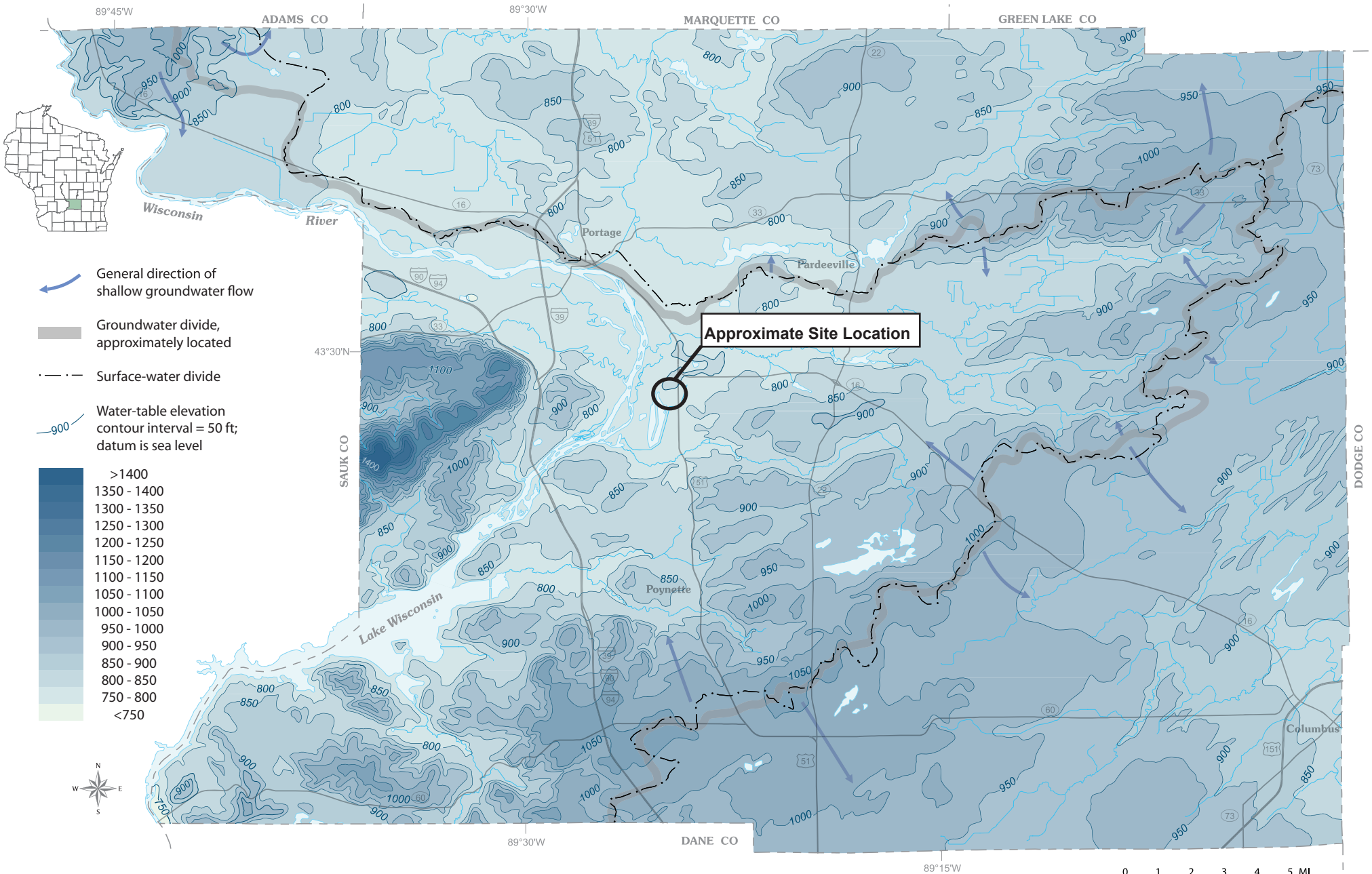
- 
 Chances of more than 100 gallons per minute are poor
- 
 Chances of 500-1000 gallons per minute are good
- 
 Chances of 100-500 gallons per minute are good
- 
 Chances of more than 1000 gallons per minute are good

—————
Boundary of saturated sand-and-gravel aquifer

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 Wisconsin-Extension Geological and Natural History Survey Information Circular Number 37, 1978.
 02/26/2024 - Classification: Internal - ECRM13238614

Generalized water-table elevation in 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 8536, MADISON, WIS. 53715 • TEL. (608) 257-4848

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

WATER LEVEL OBSERVATIONS

GENERAL NOTES

While Drilling _____

Upon Completion of Drilling _____

Time After Drilling _____

Depth to Water _____

Depth to Cave In _____

10/5/83 10/5/83

Start _____ Complete _____

Crew Chief JVS Rig B-40

Drilling Method ED 0-37'

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

Facility/Project Name WPL - Columbia Dry Ash Disposal Facility SCS#: 25220183.00		License/Permit/Monitoring Number 03025		Boring Number B-313X	
Boring Drilled By: Name of crew chief (first, last) and Firm Adam Sweet Horizon Construction and Exploration		Date Drilling Started 12/1/2022		Date Drilling Completed 12/1/2022	
Drilling Method Geoprobe/HSA		WI Unique Well No.		DNR Well ID No.	
Common Well Name		Final Static Water Level Feet MSL		Surface Elevation Feet MSL	
Borehole Diameter 2.0/8.25 in.		Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input type="checkbox"/>		Local Grid Location	
State Plane <input checked="" type="checkbox"/> Located 1.5' west of MW-313 N, E S/C/N		Lat _____ ' _____ "		Feet <input type="checkbox"/> N	
NW 1/4 of NE 1/4 of Section 27, T 12 N, R 9 E		Long _____ ' _____ "		Feet <input type="checkbox"/> S	
Facility ID 111049180		County Columbia		County Code 11	
		Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S1	44		1	SILTY GRAVEL, fine to medium sand, fine to coarse gravel, tan, angular gravel (base course/fill).	GM									Geoprobed to 35 ft. Overdrilled with HSA to 27ft and hit refusal.
			2	POORLY GRADED SAND, fine to medium, medium brown (7.5Y 5/4), trace angular fine to coarse gravel, trace silt, uniform (alluvium).									M	
S2	47		3											
			4											
S3	60		5											
			6											
			7											
			8		SP									
			9											
			10											
			11											
			12											
			13											
			14											
			15											

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 608-224-3830	Tel: 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **B-313X** Use only as an attachment to Form 4400-122. Page **2** of **2**

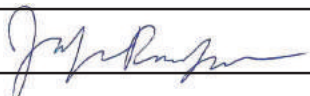
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	53		16 17 18 19 20 21 22							M				
S5	60		23 24 25		SP					M				
S6	30		26 27 28							M				Tough/hard drilling, only pushed 2.5 ft
S7	30		29 30 31							M				HSA refusal at approximately 27 ft; large boulder at depth
S8	60		32 33 34 35	Pulverized gravel at base of core.						M				Geoprobe refusal at 35 ft
				End of Borehole at 35 ft below ground surface. Abandoned borehole with 3/8" bentonite chips. Attempted monitoring well MW-313 installation.										

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

Facility/Project Name WPL - Columbia Dry Ash Disposal Facility SCS#: 25220183.00		License/Permit/Monitoring Number 03025		Boring Number MW-313	
Boring Drilled By: Name of crew chief (first, last) and Firm Adam Sweet Horizon Construction and Exploration			Date Drilling Started 12/19/2022	Date Drilling Completed 12/19/2022	Drilling Method rotasonic
WI Unique Well No. WC188	DNR Well ID No.	Common Well Name MW-313	Final Static Water Level Feet MSL	Surface Elevation ~817.80 Feet MSL	Borehole Diameter 6.0 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 542,957 N, 2,124,559 E S/C/N NW 1/4 of NE 1/4 of Section 27, T 12 N, R 9 E			Lat _____ " _____ "	Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID 111049180		County Columbia	County Code 11	Civil Town/City/ or Village Town of Pacific	

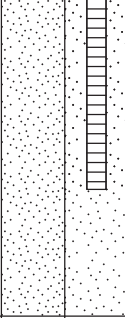
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Blind drilled to 32 feet below ground surface. See boring log B-313X for lithology from 0-32 feet.										

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 608-224-3830	Tel: 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-313** Use only as an attachment to Form 4400-122. Page **3** of **3**

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			41 42 43 44 45		SP									
				End of boring at 45 feet below ground surface. Installed monitoring well MW-313 at 43 feet.										

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

Facility/Project Name WPL - Columbia Dry Ash Disposal Facility SCS#: 25220183.00		License/Permit/Monitoring Number 03025		Boring Number MW-314	
Boring Drilled By: Name of crew chief (first, last) and Firm Adam Sweet Horizon Construction and Exploration		Date Drilling Started 12/1/2022		Date Drilling Completed 12/1/2022	
Drilling Method Geoprobe/HSA					
WI Unique Well No. WC199	DNR Well ID No.	Common Well Name MW-314	Final Static Water Level Feet MSL	Surface Elevation ~819.07 Feet MSL	Borehole Diameter 2.0/8.25 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 542,978 N, 2,124,778 E S/C/N NW 1/4 of NE 1/4 of Section 27, T 12 N, R 9 E			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID 111049180		County Columbia	County Code 11	Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S1	36		1-5	POORLY GRADED SAND, fine to coarse, light brown (fill).	SP										Geoprobbed to 45 ft, overdrilled with HSA to 45 ft
S2	36		6-10	POORLY GRADED SAND, fine to medium, light olive brown (2.5Y, 5/6), trace sub-rounded to sub-angular fine to coarse gravel (alluvium).	SP										
S3	32		11-15												

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 608-224-3830	Tel: 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-314** Use only as an attachment to Form 4400-122. Page **2** of **3**

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	36		16 17 18 19 20 21						M					
S5	55		22 23 24 25						M					
S6	60		27 28 29 30	SP					M					
S7	60		31 32 33 34 35						M+				Measured water at approximately 34 ft in augers	
S8	60		36 37 38 39 40						W				Depth to water ~36 ft	

Boring Number **MW-314** Use only as an attachment to Form 4400-122. Page **3** of **3**

Sample		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					RQD/ Comments				
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200					
S9	60		41 42 43 44 45		SP													
				End of borehole at 45 ft. Installed MW-314 to 43.5 ft.														

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

Facility/Project Name WPL - Columbia Dry Ash Disposal Facility SCS#: 25220183.00		License/Permit/Monitoring Number 03025		Boring Number MW-315	
Boring Drilled By: Name of crew chief (first, last) and Firm Adam Sweet Horizon Construction and Exploration		Date Drilling Started 12/1/2022		Date Drilling Completed 12/1/2022	
Drilling Method Geoprobe/HSA					
WI Unique Well No. PM289	DNR Well ID No.	Common Well Name MW-315	Final Static Water Level Feet MSL	Surface Elevation ~817.28 Feet MSL	Borehole Diameter 2.0/8.25 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/> State Plane 543,020 N, 2,125,065 E S/C/N NW 1/4 of NE 1/4 of Section 27, T 12 N, R 9 E			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID 111049180		County Columbia	County Code 11	Civil Town/City/ or Village 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	Soil Properties					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S1	42		1-4	POORLY GRADED SAND, fine to medium sand, fine to coarse gravel, medium brown (fill).	SP										Geoprobed to 30 ft and hit refusal. Overdrilled to 45 ft with HSA.
S2	37		5-8	POORLY GRADED SAND, fine to medium sand, light brown (7.5YR, 6/4), with fine to coarse sub-rounded to sub-angular gravel, (alluvium).	SP										
S3	40		9-12												

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


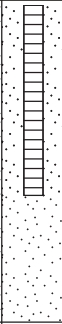
Signature 	Firm SCS Engineers 2830 Dairy Drive, Madison, WI 53718 608-224-3830	Tel: Fax:
---------------	---	--------------

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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-315** Use only as an attachment to Form 4400-122. Page **2** of **3**

Sample		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					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	60		16 17 18 19 20 21						M					
S5	60		22 23 24 25						M					
S6	27		26 27 28 29 30	SP					M					Sand got more compacted and continued to get more compacted.
S7	4		34 35 36 37 38 39 40						W					Attempt of split spoon sample at 34 ft and hit refusal. Depth to waterat ~ 34 ft.

Boring Number **MW-315** Use only as an attachment to Form 4400-122. Page **3** of **3**

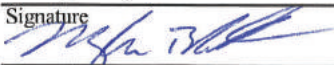
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			41 42 43 44 45		SP									
			45	End of boring at 45 feet. Installed MW-315 to 43 feet.										

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

Facility/Project Name WPL-Columbia		SCS#: 25215135.00		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State Drilling				Date Drilling Started 11/11/2015		Date Drilling Completed 11/11/2015	
WI Unique Well No. VY701		DNR Well ID No.		Common Well Name		Final Static Water Level Feet	
						Surface Elevation 803.69 Feet	
						Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/>) or Boring Location <input checked="" type="checkbox"/>				Local Grid Location			
State Plane 541562.2 N, 2025001.0 E S/C/N				Lat _____ " <input type="checkbox"/> N <input type="checkbox"/> E			
1/4 of _____ 1/4 of Section 27 , T 12 N, R 9 E				Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W			
Facility ID		County Columbia		County Code 11		Civil Town/City/ or Village Portage	

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

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 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-301**

Use only as an attachment to Form 4400-122.

Page **2** of **2**

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

WELL DETAIL INFORMATION SHEET

JOB NO. C 7134

BORING NO. MW-84A

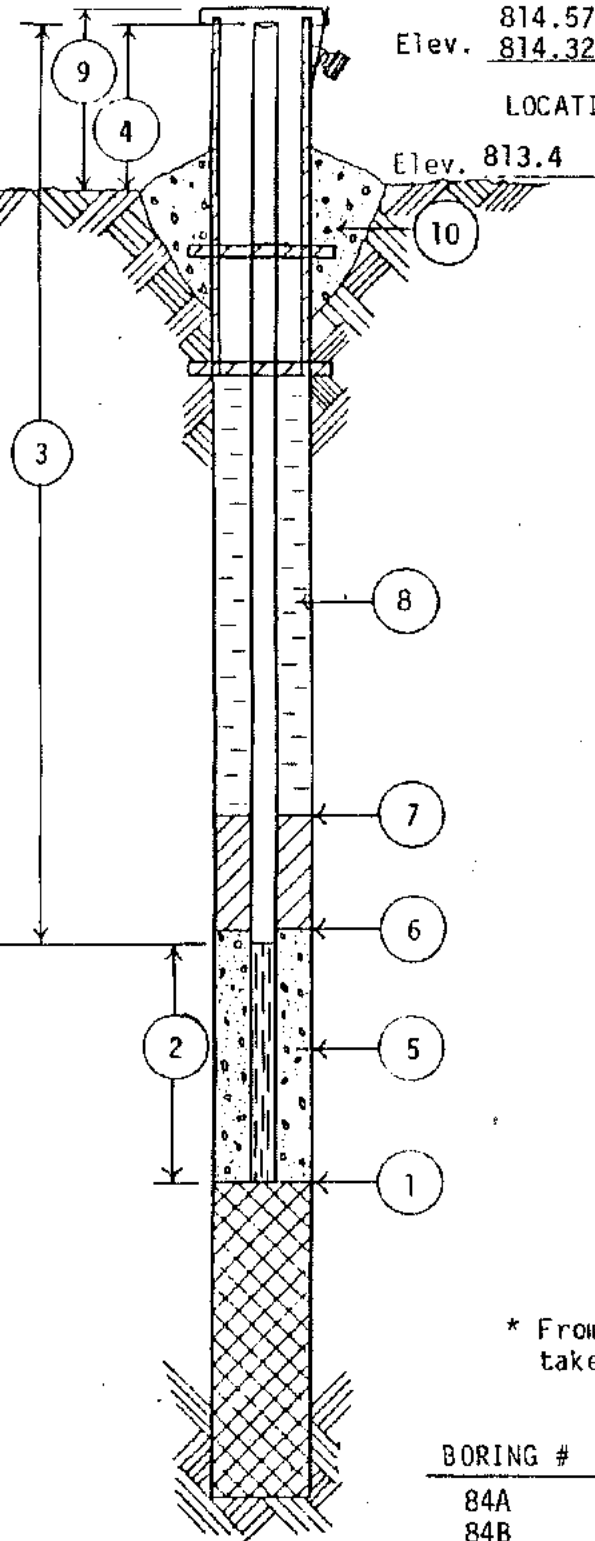
DATE 10/5/83

Elev. 814.57 Steel
Elev. 814.32 PVC CHIEF JS

LOCATION WP&L-Columbia Generating Station

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

Elev. 813.4



- 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"	



State of Wisconsin
Department of Natural Resources

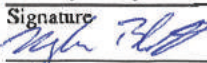
Route to: Watershed/Wastewater Waste Management
 Remediation/Redevelopment Other

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

Facility/Project Name WPL-Columbia	Local Grid Location of Well _____ ft. <input type="checkbox"/> N. _____ ft. <input type="checkbox"/> E. _____ ft. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> W.	Well Name MW-301
Facility License, Permit or Monitoring No.	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. _____ " Long. _____ " or _____	Wis. Unique Well No. DNR Well ID No. VY701
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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Duerst
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number _____
Enf. Stds. Apply <input type="checkbox"/>		Badger State Drilling

A. Protective pipe, top elevation --- 807.16 ft. MSL	1. Cap and lock? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation --- 806.89 ft. MSL	2. Protective cover pipe: a. Inside diameter: --- 6 in. b. Length: --- 5 ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation --- 803.69 ft. MSL	d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: bumper posts
D. Surface seal, bottom --- 791.69 ft. MSL or --- 12 ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 30 Bentonite to grade, sand above Other <input type="checkbox"/>
13. Sieve analysis performed? <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft ³ volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. _____ 4 ft ³ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7. Fine sand material: Manufacturer, product name & mesh size a. _____ RW Sidley Inc. #7 <input type="checkbox"/> b. Volume added _____ 0.5 ft ³
Describe _____	8. Filter pack material: Manufacturer, product name & mesh size a. _____ RW Sidley #5 <input type="checkbox"/> b. Volume added _____ 2 ft ³
17. Source of water (attach analysis, if required): _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top --- 803.69 ft. MSL or --- 0 ft.	10. Screen material: _____ PVC a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top --- 791.69 ft. MSL or --- 12 ft.	b. Manufacturer _____ Johnson c. Slot size: 0.01 in. d. Slotted length: --- 10 ft.
G. Filter pack, top --- 789.69 ft. MSL or --- 14 ft.	11. Backfill material (below filter pack): None <input type="checkbox"/> 14 Other <input checked="" type="checkbox"/>
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.	

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 53718-6751

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.

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> E. ft. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name MW-313
Facility License, Permit or Monitoring No. 03025	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. " Long. " or " or "	Wis. Unique Well No. <u>WC188</u> DNR Well ID No. _____
Facility ID 111049180	St. Plane <u>542956.598</u> ft. N, <u>2124559.041</u> ft. E. S/C/N	Date Well Installed, <u>12 / 019 / 2022</u> m m d d y y y y
Type of Well Well Code <u>11</u> / MW	Section Location of Waste/Source NW 1/4 of NE 1/4 of Sec. <u>27</u> , T. <u>12</u> N, R. <u>09</u> E W	Well Installed By: Name (first, last) and Firm <u>Adam Sweet</u>
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source: u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Gov. Lot Number _____
Enf. Stds. Apply <input checked="" type="checkbox"/>	Horizon Construction and Exploration	

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation 820.30 ft. MSL
- C. Land surface elevation ~817.80 ft. MSL
- D. Surface seal, bottom _____ ft. MSL or _____ ft.

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

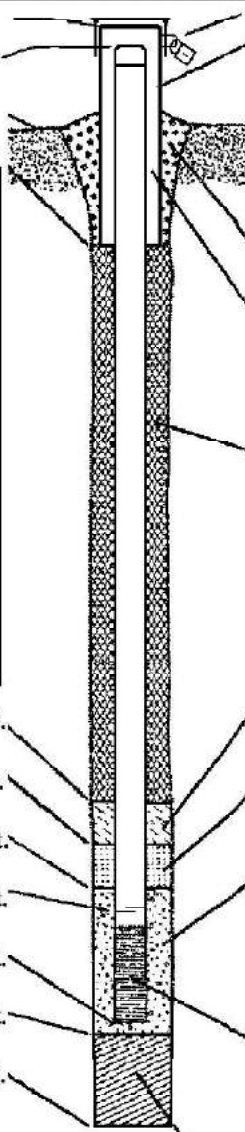
13. Sieve analysis performed? Yes No

14. Drilling method used: Rotary 5 0
 Rotosonic 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 NA

17. Source of water (attach analysis, if required):
Horizon's drilling shop



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: _____ in.
 - b. Length: 5 ft.
 - c. Material: Steel 0 4
Other
 - d. Additional protection? Yes No
If yes, describe: Three bollards
- 3. Surface seal: Bentonite 3 0
Concrete 0 1
Other
- 4. Material between well casing and protective pipe: Bentonite 3 0
Filter sand
- 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. 5.22 Ft³ 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
Red Flint #5
 - b. Volume added 0.36 ft³
- 8. Filter pack material: Manufacturer, product name & mesh size
Red Flint #7
 - b. Volume added 2.52 ft³
- 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
SP- native, cave in

- E. Bentonite seal, top ~817.80 ft. MSL or 0 ft.
- F. Fine sand, top ~788.80 ft. MSL or 29 ft.
- G. Filter pack, top ~786.80 ft. MSL or 31 ft.
- H. Screen joint, top ~784.80 ft. MSL or 33 ft.
- I. Well bottom ~774.80 ft. MSL or 43 ft.
- J. Filter pack, bottom ~772.80 ft. MSL or 45 ft.
- K. Borehole, bottom ~772.80 ft. MSL or 45 ft.
- L. Borehole, diameter 6.00 in.
- M. O.D. well casing 2.31 in.
- N. I.D. well casing 2.21 in.

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

Signature Jackie Rennebohm 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.

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-314
Facility License, Permit or Monitoring No. 03025	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. " Long. " or " or "	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
Facility ID 111049180	St. Plane 542978.081 ft. N, 2124778.237 ft. E. S/C/N	Date Well Installed, 12 / 01 / 2022 m m d d y y y y
Type of Well Well Code 11 / MW	Section Location of Waste/Source NW 1/4 of NE 1/4 of Sec. 27, T. 12 N, R. 09 E W	Well Installed By: Name (first, last) and Firm Adam Sweet
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Horizon Construction and Exploration

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ 821.57 ft. MSL
- C. Land surface elevation _____ ~819.07 ft. MSL
- D. Surface seal, bottom _____ ft. MSL or _____ ft.

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

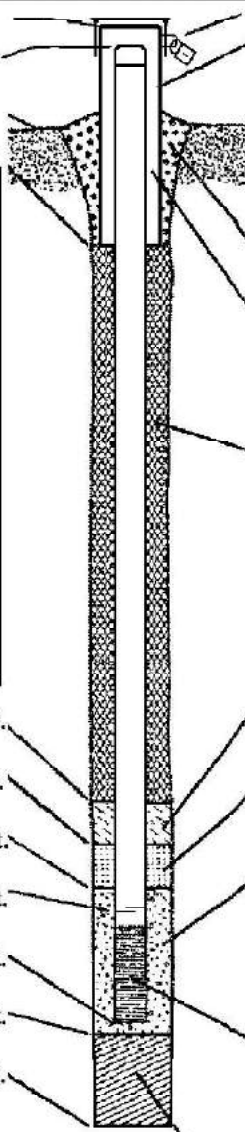
13. Sieve analysis performed? Yes No

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 NA

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



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: _____ 4 in.
 - b. Length: _____ 5 ft.
 - c. Material: Steel 0 4
Other
 - d. Additional protection? Yes No
If yes, describe: Three bollards
- 3. Surface seal: Bentonite 3 0
Concrete 0 1
Other
- 4. Material between well casing and protective pipe: Bentonite 3 0
Filter sand 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. 10.47 Ft³ 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. Red Flint #5
b. Volume added 0.71 ft³
- 8. Filter pack material: Manufacturer, product name & mesh size
a. Red Flint #7
b. Volume added 4.26 ft³
- 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
SP- native, cave in Other

- E. Bentonite seal, top _____ ~819.07 ft. MSL or _____ 0 ft.
- F. Fine sand, top _____ ~789.57 ft. MSL or _____ 29.5 ft.
- G. Filter pack, top _____ ~787.57 ft. MSL or _____ 31.5 ft.
- H. Screen joint, top _____ ~785.57 ft. MSL or _____ 33.5 ft.
- I. Well bottom _____ ~775.57 ft. MSL or _____ 43.5 ft.
- J. Filter pack, bottom _____ ~775.57 ft. MSL or _____ 43.5 ft.
- K. Borehole, bottom _____ ~774.07 ft. MSL or _____ 45 ft.
- L. Borehole, diameter _____ 8.25 in.
- M. O.D. well casing _____ 2.31 in.
- N. I.D. well casing _____ 2.21 in.

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

Signature *Jackie Rennsbohm* 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.

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	Local Grid Location of Well ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-315
Facility License, Permit or Monitoring No. 03025	Local Grid Origin (estimated: <input type="checkbox"/>) or Well Location <input type="checkbox"/> Lat. " Long. " or " or "	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
Facility ID 111049180	St. Plane 543019.956 ft. N, 2125065.014 ft. E. S/C/N	Date Well Installed, 12 / 2 / 2022 m m d d y y y y
Type of Well Well Code 11 / MW	Section Location of Waste/Source NW 1/4 of NE 1/4 of Sec. 27, T. 12 N, R. 09 E W	Well Installed By: Name (first, last) and Firm Adam Sweet
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source: u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Horizon Construction and Exploration

- A. Protective pipe, top elevation _____ ft. MSL
- B. Well casing, top elevation _____ 819.78 ft. MSL
- C. Land surface elevation _____ ~817.28 ft. MSL
- D. Surface seal, bottom _____ ft. MSL or _____ 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

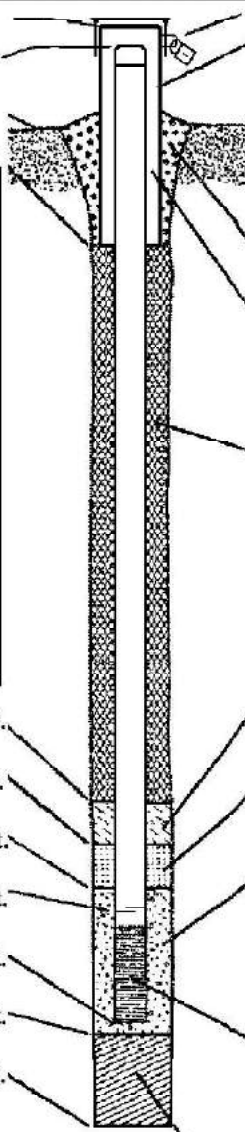
14. Drilling method used: Rotary 5 0
 Hollow Stem Auger 4 1
 Other

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

16. Drilling additives used? Yes No

Describe NA

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



- 1. Cap and lock? Yes No
- 2. Protective cover pipe:
 - a. Inside diameter: _____ 4 in.
 - b. Length: _____ 5 ft.
 - c. Material: Steel 0 4
Other
 - d. Additional protection? Yes No
If yes, describe: three bollards
- 3. Surface seal: Bentonite 3 0
Concrete 0 1
Other
- 4. Material between well casing and protective pipe:
 Filter Sand Bentonite 3 0
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. 10.23 Ft³ 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. Red Flint #5
 b. Volume added _____ 0.71 ft³
- 8. Filter pack material: Manufacturer, product name & mesh size
 a. Red Flint #7
 b. Volume added _____ 4.97 ft³
- 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

- E. Bentonite seal, top _____ ~817.28 ft. MSL or _____ 0 ft.
- F. Fine sand, top _____ ~788.28 ft. MSL or _____ 29 ft.
- G. Filter pack, top _____ ~786.28 ft. MSL or _____ 31 ft.
- H. Screen joint, top _____ ~784.28 ft. MSL or _____ 33 ft.
- I. Well bottom _____ ~774.28 ft. MSL or _____ 43 ft.
- J. Filter pack, bottom _____ ~772.28 ft. MSL or _____ 45 ft.
- K. Borehole, bottom _____ ~772.28 ft. MSL or _____ 45 ft.
- L. Borehole, diameter _____ 8.25 in.
- M. O.D. well casing _____ 2.31 in.
- N. I.D. well casing _____ 2.21 in.

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

Signature Jackie Rennebohm 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.

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

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	County Name Columbia	Well Name MW-313	
Facility License, Permit or Monitoring Number 03025	County Code 11	Wis. Unique Well Number WC188	DNR Well ID Number _____

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 _____ 45 min.

4. Depth of well (from top of well casing) _____ 46 18 ft.

5. Inside diameter of well _____ 2 21 in.

6. Volume of water in filter pack and well casing _____ 10 6 gal.

7. Volume of water removed from well _____ 110 0 gal.

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

9. Source of water added _____ NA

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

17. Additional comments on development:


31 degrees F and cloudy
Purge rate= 5 gallons/ 2 minutes

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 37 _____ 34 ft.	_____ 37 _____ 43 ft.
Date	b. _____ 12 / _____ 30 / _____ 2022	_____ 12 / _____ 30 / _____ 2022
Time	c. _____ 3 : 05 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	_____ 3 : 50 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 1 0 Turbid <input type="checkbox"/> 1 5 (Describe) _____	Clear <input checked="" type="checkbox"/> 2 0 Turbid <input type="checkbox"/> 2 5 (Describe) _____
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: Adam Last Name: Watson
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Name and Address of Facility Contact /Owner/Responsible Party
 First Name: _____ Last Name: _____
 Facility/Firm: Wisconsin Power and Light Co. - Alliant Energy
 Street: 1919 Alliant Energy Center Way
 City/State/Zip: Madison, WI 53713

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

Signature: 

Print Name: Adam Watson

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.

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

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	County Name Columbia	Well Name MW-314	
Facility License, Permit or Monitoring Number 03025	County Code 11	Wis. Unique Well Number WC199	DNR Well ID Number _____

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 _____ 132 min.

4. Depth of well (from top of well casing) _____ 44.96 ft.

5. Inside diameter of well _____ 2.31 in.

6. Volume of water in filter pack and well casing _____ 10.4 gal.

7. Volume of water removed from well _____ 120.0 gal.

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

9. Source of water added _____ NA

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


17. Additional comments on development:

31 degrees F and cloudy
Purge rate= 5.0 gallons/ 5 minutes

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 37 _____ 34 ft.	_____ 38 _____ 37 ft.
Date	b. _____ 12 / _____ 30 / _____ 2022	_____ 12 / _____ 30 / _____ 2022
Time	c. _____ 11 : 10 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ 1 : 22 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 10 Turbid <input type="checkbox"/> 15 (Describe) _____	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe) _____
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: Adam Last Name: Watson
Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718

Name and Address of Facility Contact /Owner/Responsible Party
First Name: _____ Last Name: _____
Facility/Firm: Wisconsin Power and Light Co. - Alliant Energy
Street: 1919 Alliant Energy Center Way
City/State/Zip: Madison, WI 53713

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: 
Print Name: Adam Watson
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.

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

Facility/Project Name WPL-Columbia Dry Ash Disposal Facility	County Name Columbia	Well Name MW-315	
Facility License, Permit or Monitoring Number 03025	County Code 11	Wis. Unique Well Number PM289	DNR Well ID Number _____

1. Can this well be purged dry? Yes No

2. Well development method

surged with bailer and bailed	<input type="checkbox"/> 41
surged with bailer and pumped	<input checked="" type="checkbox"/> 61
surged with block and bailed	<input type="checkbox"/> 42
surged with block and pumped	<input type="checkbox"/> 62
surged with block, bailed and pumped	<input type="checkbox"/> 70
compressed air	<input type="checkbox"/> 20
bailed only	<input type="checkbox"/> 10
pumped only	<input type="checkbox"/> 51
pumped slowly	<input type="checkbox"/> 50
Other _____	<input type="checkbox"/>

3. Time spent developing well _____ 120 min.

4. Depth of well (from top of well casing) _____ 45 61 ft.

5. Inside diameter of well _____ 2 31 in.

6. Volume of water in filter pack and well casing _____ 10 64 gal.

7. Volume of water removed from well _____ 120 0 gal.

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

9. Source of water added _____ NA

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. _____ 36 _____ 34 ft.	_____ 36 _____ 34 ft.
Date	b. _____ 12 / _____ 30 / _____ 2022	_____ 12 / _____ 30 / _____ 2022
Time	c. _____ 10:40 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ 12:40 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input checked="" type="checkbox"/> 1 0	Clear <input checked="" type="checkbox"/> 2 0
	Turbid <input type="checkbox"/> 1 5	Turbid <input type="checkbox"/> 2 5
	(Describe) _____	(Describe) _____
	_____	_____
	_____	_____
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: Adam Last Name: Watson

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

17. Additional comments on development:
31 degrees F and cloudy
Purge rate= 1gallon/minute

Name and Address of Facility Contact /Owner/Responsible Party


First Name: _____ Last Name: _____

Facility/Firm: Wisconsin Power and Light Co. - Alliant Energy

Street: 1919 Alliant Energy Center Way

City/State/Zip: Madison, WI 53713


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

Signature: 

Print Name: Adam Watson

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

April 10, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on January 25, 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

Revised Report: A combined radium result is now included.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40257467001	MW-313	Water	01/24/23 11:45	01/25/23 08:00
40257467002	MW-314	Water	01/24/23 10:25	01/25/23 08:00
40257467003	MW-315	Water	01/24/23 12:00	01/25/23 08:00
40257467004	FIELD BLANK MOD 10-11	Water	01/24/23 12:30	01/25/23 08:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40257467001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			CKV	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	TMK	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40257467002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS			14	PASI-G
EPA 7470	AJT			1	PASI-G
	CKV			7	PASI-G
EPA 903.1	GDH			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	SRK			1	PASI-G
EPA 9040	YER			1	PASI-G
EPA 300.0	TMK			3	PASI-G
EPA 310.2	DAW			1	PASI-G
EPA 353.2	DAW			1	PASI-G
40257467003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			CKV	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	TMK	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40257467004	FIELD BLANK MOD 10-11	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	TMK	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-313 Lab ID: 40257467001 Collected: 01/24/23 11:45 Received: 01/25/23 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	01/26/23 06:22	01/26/23 16:45	7440-50-8	
Manganese	328	ug/L	5.0	1.5	1	01/26/23 06:22	01/26/23 16:45	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	01/26/23 06:22	01/26/23 16:45	7440-22-4	
Total Hardness by 2340B	321	mg/L	27.0	5.0	5	01/26/23 06:22	01/27/23 13:30		
Zinc	<11.6	ug/L	40.0	11.6	1	01/26/23 06:22	01/26/23 16:45	7440-66-6	
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	01/26/23 05:36	01/31/23 05:43	7440-36-0	1q
Arsenic	<0.28	ug/L	1.0	0.28	1	01/26/23 05:36	01/31/23 05:43	7440-38-2	
Barium	70.5	ug/L	2.3	0.70	1	01/26/23 05:36	01/31/23 05:43	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	01/26/23 05:36	01/31/23 05:43	7440-41-7	
Boron	25.1	ug/L	10.0	3.0	1	01/26/23 05:36	01/31/23 05:43	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	01/26/23 05:36	01/31/23 05:43	7440-43-9	
Calcium	66800	ug/L	254	76.2	1	01/26/23 05:36	01/31/23 05:43	7440-70-2	
Chromium	5.2	ug/L	3.4	1.0	1	01/26/23 05:36	01/31/23 15:03	7440-47-3	
Cobalt	0.40J	ug/L	1.0	0.12	1	01/26/23 05:36	01/31/23 05:43	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	01/26/23 05:36	01/31/23 05:43	7439-92-1	
Lithium	0.75J	ug/L	1.0	0.22	1	01/26/23 05:36	01/31/23 05:43	7439-93-2	
Molybdenum	4.3	ug/L	1.5	0.44	1	01/26/23 05:36	01/31/23 05:43	7439-98-7	
Selenium	0.41J	ug/L	1.1	0.32	1	01/26/23 05:36	01/31/23 05:43	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	01/26/23 05:36	01/31/23 05:43	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	01/27/23 10:30	01/30/23 08:15	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.43	Std. Units			1		01/24/23 11:45		
Field Specific Conductance	509.5	umhos/cm			1		01/24/23 11:45		
Oxygen, Dissolved	4.08	mg/L			1		01/24/23 11:45	7782-44-7	
REDOX	82.6	mV			1		01/24/23 11:45		
Turbidity	0.00	NTU			1		01/24/23 11:45		
Static Water Level	783.36	feet			1		01/24/23 11:45		
Temperature, Water (C)	9.4	deg C			1		01/24/23 11:45		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	298	mg/L	20.0	8.7	1		01/26/23 14:00		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		01/31/23 08:16		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-313 **Lab ID: 40257467001** Collected: 01/24/23 11:45 Received: 01/25/23 08:00 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	1.4J	mg/L	2.0	0.43	1		02/03/23 04:06	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		02/03/23 04:06	16984-48-8	M0
Sulfate	5.7	mg/L	2.0	0.44	1		02/03/23 04:06	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		01/26/23 13:35		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	3.9	mg/L	0.25	0.059	1		01/30/23 12:26		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 04/10/2023 06:48 AM

02/26/2024 - Classification: Internal - ECRM13238614

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Sample: MW-314 **Lab ID: 40257467002** Collected: 01/24/23 10:25 Received: 01/25/23 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	01/26/23 06:22	01/26/23 16:53	7440-50-8	
Manganese	77.8	ug/L	5.0	1.5	1	01/26/23 06:22	01/26/23 16:53	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	01/26/23 06:22	01/26/23 16:53	7440-22-4	
Total Hardness by 2340B	403	mg/L	5.4	1.0	1	01/26/23 06:22	01/26/23 16:53		
Zinc	<11.6	ug/L	40.0	11.6	1	01/26/23 06:22	01/26/23 16:53	7440-66-6	
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	01/26/23 05:36	01/31/23 05:51	7440-36-0	1q
Arsenic	<0.28	ug/L	1.0	0.28	1	01/26/23 05:36	01/31/23 05:51	7440-38-2	
Barium	48.7	ug/L	2.3	0.70	1	01/26/23 05:36	01/31/23 05:51	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	01/26/23 05:36	01/31/23 05:51	7440-41-7	
Boron	14.2	ug/L	10.0	3.0	1	01/26/23 05:36	01/31/23 05:51	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	01/26/23 05:36	01/31/23 05:51	7440-43-9	
Calcium	95000	ug/L	254	76.2	1	01/26/23 05:36	01/31/23 05:51	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	01/26/23 05:36	01/31/23 15:11	7440-47-3	
Cobalt	0.31J	ug/L	1.0	0.12	1	01/26/23 05:36	01/31/23 05:51	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	01/26/23 05:36	01/31/23 05:51	7439-92-1	
Lithium	0.33J	ug/L	1.0	0.22	1	01/26/23 05:36	01/31/23 05:51	7439-93-2	
Molybdenum	1.7	ug/L	1.5	0.44	1	01/26/23 05:36	01/31/23 05:51	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	01/26/23 05:36	01/31/23 05:51	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	01/26/23 05:36	01/31/23 05:51	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	01/27/23 10:30	01/30/23 08:17	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.23	Std. Units			1		01/24/23 10:25		
Field Specific Conductance	654.9	umhos/cm			1		01/24/23 10:25		
Oxygen, Dissolved	6.21	mg/L			1		01/24/23 10:25	7782-44-7	
REDOX	78.0	mV			1		01/24/23 10:25		
Turbidity	7.30	NTU			1		01/24/23 10:25		
Static Water Level	783.63	feet			1		01/24/23 10:25		
Temperature, Water (C)	10.3	deg C			1		01/24/23 10:25		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	380	mg/L	20.0	8.7	1		01/26/23 14:00		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		01/31/23 08:21		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-314 **Lab ID: 40257467002** Collected: 01/24/23 10:25 Received: 01/25/23 08:00 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	1.8J	mg/L	2.0	0.43	1		02/03/23 05:35	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		02/03/23 05:35	16984-48-8	
Sulfate	4.2	mg/L	2.0	0.44	1		02/03/23 05:35	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	427	mg/L	25.0	7.4	1		01/26/23 13:36		
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	0.28	mg/L	0.25	0.059	1		01/30/23 12:27		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-315 Lab ID: 40257467003 Collected: 01/24/23 12:00 Received: 01/25/23 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	01/26/23 06:22	01/26/23 16:57	7440-50-8	
Manganese	165	ug/L	5.0	1.5	1	01/26/23 06:22	01/26/23 16:57	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	01/26/23 06:22	01/26/23 16:57	7440-22-4	
Total Hardness by 2340B	481	mg/L	5.4	1.0	1	01/26/23 06:22	01/26/23 16:57		
Zinc	<11.6	ug/L	40.0	11.6	1	01/26/23 06:22	01/26/23 16:57	7440-66-6	
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	01/26/23 05:36	01/31/23 05:58	7440-36-0	1q
Arsenic	<0.28	ug/L	1.0	0.28	1	01/26/23 05:36	01/31/23 05:58	7440-38-2	
Barium	57.5	ug/L	2.3	0.70	1	01/26/23 05:36	01/31/23 05:58	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	01/26/23 05:36	01/31/23 05:58	7440-41-7	
Boron	11.7	ug/L	10.0	3.0	1	01/26/23 05:36	01/31/23 05:58	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	01/26/23 05:36	01/31/23 05:58	7440-43-9	
Calcium	107000	ug/L	254	76.2	1	01/26/23 05:36	01/31/23 05:58	7440-70-2	
Chromium	1.2J	ug/L	3.4	1.0	1	01/26/23 05:36	01/31/23 15:18	7440-47-3	
Cobalt	0.24J	ug/L	1.0	0.12	1	01/26/23 05:36	01/31/23 05:58	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	01/26/23 05:36	01/31/23 05:58	7439-92-1	
Lithium	0.62J	ug/L	1.0	0.22	1	01/26/23 05:36	01/31/23 05:58	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	01/26/23 05:36	01/31/23 05:58	7439-98-7	
Selenium	0.40J	ug/L	1.1	0.32	1	01/26/23 05:36	01/31/23 05:58	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	01/26/23 05:36	01/31/23 05:58	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	01/27/23 10:30	01/30/23 08:20	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.13	Std. Units			1		01/24/23 12:00		
Field Specific Conductance	748	umhos/cm			1		01/24/23 12:00		
Oxygen, Dissolved	7.65	mg/L			1		01/24/23 12:00	7782-44-7	
REDOX	38.4	mV			1		01/24/23 12:00		
Turbidity	6.43	NTU			1		01/24/23 12:00		
Static Water Level	783.77	feet			1		01/24/23 12:00		
Temperature, Water (C)	10.5	deg C			1		01/24/23 12:00		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	436	mg/L	20.0	8.7	1		01/26/23 14:01		
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		01/31/23 08:40		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-315 **Lab ID: 40257467003** Collected: 01/24/23 12:00 Received: 01/25/23 08:00 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	4.9	mg/L	2.0	0.43	1		02/03/23 05:50	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		02/03/23 05:50	16984-48-8	
Sulfate	9.2	mg/L	2.0	0.44	1		02/03/23 05:50	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	490	mg/L	50.0	14.9	2		01/26/23 13:40		M0
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	0.76	mg/L	0.25	0.059	1		01/30/23 12:28		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Sample: FIELD BLANK MOD 10-11 Lab ID: 40257467004 Collected: 01/24/23 12:30 Received: 01/25/23 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	01/26/23 06:22	01/26/23 16:59	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	01/26/23 06:22	01/26/23 16:59	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	01/26/23 06:22	01/26/23 16:59	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	01/26/23 06:22	01/26/23 16:59		
Zinc	<11.6	ug/L	40.0	11.6	1	01/26/23 06:22	01/26/23 16:59	7440-66-6	
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	01/26/23 05:36	01/31/23 06:05	7440-36-0	1q
Arsenic	<0.28	ug/L	1.0	0.28	1	01/26/23 05:36	01/31/23 06:05	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	01/26/23 05:36	01/31/23 06:05	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	01/26/23 05:36	01/31/23 06:05	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	01/26/23 05:36	01/31/23 06:05	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	01/26/23 05:36	01/31/23 06:05	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	01/26/23 05:36	01/31/23 06:05	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	01/26/23 05:36	01/31/23 14:48	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	01/26/23 05:36	01/31/23 06:05	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	01/26/23 05:36	01/31/23 06:05	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	01/26/23 05:36	01/31/23 06:05	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	01/26/23 05:36	01/31/23 06:05	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	01/26/23 05:36	01/31/23 06:05	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	01/26/23 05:36	01/31/23 06:05	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	01/27/23 10:30	01/30/23 08:22	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		01/26/23 14:01		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.4	Std. Units	0.10	0.010	1		01/31/23 08:54		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		02/03/23 06:05	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		02/03/23 06:05	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		02/03/23 06:05	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		01/26/23 13:43		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: FIELD BLANK MOD 10-11 **Lab ID: 40257467004** Collected: 01/24/23 12:30 Received: 01/25/23 08:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		01/30/23 12:28		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch:	436656	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2511018 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	01/30/23 07:57	

LABORATORY CONTROL SAMPLE: 2511019

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2511020 2511021

Parameter	Units	40257527001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L				4.8	4.5				5	20	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch:	436528	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2510539 Matrix: Water

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	<3.4	10.0	01/26/23 16:41	
Manganese	ug/L	<1.5	5.0	01/26/23 16:41	
Silver	ug/L	<3.2	10.0	01/26/23 16:41	
Total Hardness by 2340B	mg/L	<1.0	5.4	01/26/23 16:41	
Zinc	ug/L	<11.6	40.0	01/26/23 16:41	

LABORATORY CONTROL SAMPLE: 2510540

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	253	101	80-120	
Manganese	ug/L	250	256	102	80-120	
Silver	ug/L	125	125	100	80-120	
Total Hardness by 2340B	mg/L		65.9			
Zinc	ug/L	250	251	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2510541 2510542

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40257467001 Result	Spike Conc.	Spike Conc.	Result						
Copper	ug/L	<3.4	250	250	258	260	102	103	75-125	1	20
Manganese	ug/L	328	250	250	578	588	100	104	75-125	2	20
Silver	ug/L	<3.2	125	125	127	127	101	101	75-125	0	20
Total Hardness by 2340B	mg/L	321			385	395				2	20
Zinc	ug/L	<11.6	250	250	251	253	100	101	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

QC Batch: 436525 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2510527 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	01/31/23 03:46	
Arsenic	ug/L	<0.28	1.0	01/31/23 03:46	
Barium	ug/L	<0.70	2.3	01/31/23 03:46	
Beryllium	ug/L	<0.25	1.0	01/31/23 03:46	
Boron	ug/L	<3.0	10.0	01/31/23 03:46	
Cadmium	ug/L	<0.15	1.0	01/31/23 03:46	
Calcium	ug/L	<76.2	254	01/31/23 03:46	
Chromium	ug/L	<1.0	3.4	01/31/23 13:13	
Cobalt	ug/L	<0.12	1.0	01/31/23 03:46	
Lead	ug/L	<0.24	1.0	01/31/23 03:46	
Lithium	ug/L	<0.22	1.0	01/31/23 03:46	
Molybdenum	ug/L	<0.44	1.5	01/31/23 03:46	
Selenium	ug/L	<0.32	1.1	01/31/23 03:46	
Thallium	ug/L	<0.14	1.0	01/31/23 03:46	

LABORATORY CONTROL SAMPLE: 2510528

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	261	104	80-120	
Arsenic	ug/L	250	255	102	80-120	
Barium	ug/L	250	255	102	80-120	
Beryllium	ug/L	250	255	102	80-120	
Boron	ug/L	250	239	95	80-120	
Cadmium	ug/L	250	261	104	80-120	
Calcium	ug/L	10000	10300	103	80-120	
Chromium	ug/L	250	247	99	80-120	
Cobalt	ug/L	250	250	100	80-120	
Lead	ug/L	250	258	103	80-120	
Lithium	ug/L	250	255	102	80-120	
Molybdenum	ug/L	250	259	104	80-120	
Selenium	ug/L	250	263	105	80-120	
Thallium	ug/L	250	251	100	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Parameter	Units	2510529		2510530		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40257413001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	<0.15	250	250	266	256	106	102	75-125	4	20		
Arsenic	ug/L	1.4	250	250	264	258	105	103	75-125	2	20		
Barium	ug/L	30.7	250	250	286	282	102	100	75-125	1	20		
Beryllium	ug/L	<0.25	250	250	256	250	102	100	75-125	2	20		
Boron	ug/L	346	250	250	612	588	106	97	75-125	4	20		
Cadmium	ug/L	<0.15	250	250	260	251	104	100	75-125	3	20		
Calcium	ug/L	92700	10000	10000	105000	102000	123	96	75-125	3	20		
Chromium	ug/L	<1.0	250	250	243	240	97	96	75-125	1	20		
Cobalt	ug/L	0.37J	250	250	254	248	101	99	75-125	2	20		
Lead	ug/L	0.24J	250	250	262	255	105	102	75-125	3	20		
Lithium	ug/L	0.29J	250	250	256	249	102	100	75-125	3	20		
Molybdenum	ug/L	2.4	250	250	261	262	104	104	75-125	0	20		
Selenium	ug/L	<0.32	250	250	273	265	109	106	75-125	3	20		
Thallium	ug/L	0.23J	250	250	255	251	102	100	75-125	2	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch: 436574	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2510751 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	01/26/23 13:59	

LABORATORY CONTROL SAMPLE: 2510752

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	596	554	93	80-120	

SAMPLE DUPLICATE: 2510753

Parameter	Units	40257396002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	100	104	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch: 436819

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

SAMPLE DUPLICATE: 2511795

Parameter	Units	40257413001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.5	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch:	436611	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: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2510824 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	02/03/23 03:36	
Fluoride	mg/L	<0.095	0.32	02/03/23 03:36	
Sulfate	mg/L	<0.44	2.0	02/03/23 03:36	

LABORATORY CONTROL SAMPLE: 2510825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.6	103	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	20.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2510826 2510827

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40257467001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	1.4J	20	20	22.8	23.0	107	108	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	2.6	2.2	128	111	90-110	14	15	M0	
Sulfate	mg/L	5.7	20	20	26.9	27.5	106	109	90-110	2	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

QC Batch: 436488 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: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2509904 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	01/26/23 13:14	

LABORATORY CONTROL SAMPLE: 2509905

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	95.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2509906 2509907

Parameter	Units	40257341013		2509906		2509907		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Alkalinity, Total as CaCO3	mg/L	548	200	200	200	765	755	108	103	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2509908 2509909

Parameter	Units	40257467003		2509908		2509909		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result					
Alkalinity, Total as CaCO3	mg/L	490	200	200	200	731	691	121	100	90-110	6	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

QC Batch: 436754 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

METHOD BLANK: 2511600 Matrix: Water
Associated Lab Samples: 40257467001, 40257467002, 40257467003, 40257467004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	01/30/23 12:36	

LABORATORY CONTROL SAMPLE: 2511601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2511602 2511603

Parameter	Units	2511602		2511603		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Result	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.5	2.5	100	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2511604 2511605

Parameter	Units	2511604		2511605		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Result	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	5.2	2.5	2.5	7.5	93	96	90-110	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	-0.326 ± 0.506 (1.22) C:NA T:93%	pCi/L	02/04/23 13:38	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.345 ± 0.296 (0.592) C:92% T:87%	pCi/L	02/02/23 11:12	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.345 ± 0.802 (1.81)	pCi/L	04/06/23 17:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-314 **Lab ID: 40257467002** Collected: 01/24/23 10:25 Received: 01/25/23 08:00 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	0.436 ± 0.618 (1.05) C:NA T:91%	pCi/L	02/04/23 13:52	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	-0.00229 ± 0.263 (0.613) C:92% T:86%	pCi/L	02/02/23 11:12	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.436 ± 0.881 (1.66)	pCi/L	04/06/23 17:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

Sample: MW-315 **Lab ID: 40257467003** Collected: 01/24/23 12:00 Received: 01/25/23 08:00 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	-0.0798 ± 0.469 (1.05) C:NA T:97%	pCi/L	02/04/23 13:52	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.351 ± 0.302 (0.608) C:91% T:88%	pCi/L	02/02/23 11:12	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.351 ± 0.771 (1.66)	pCi/L	04/06/23 17:08	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch: 563007

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: 40257467001, 40257467002, 40257467003

METHOD BLANK: 2734746

Matrix: Water

Associated Lab Samples: 40257467001, 40257467002, 40257467003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.464 ± 0.432 (0.569) C:NA T:101%	pCi/L	02/04/23 13:38	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 COL CCR MOD10-11

Pace Project No.: 40257467

QC Batch: 563008

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: 40257467001, 40257467002, 40257467003

METHOD BLANK: 2734747

Matrix: Water

Associated Lab Samples: 40257467001, 40257467002, 40257467003

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0754 ± 0.199 (0.447) C:93% T:94%	pCi/L	02/02/23 11:11	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Analyte was measured in the associated method blank at a concentration of -0.26ug/L.
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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40257467001	MW-313	EPA 3010A	436528	EPA 6010D	436588
40257467002	MW-314	EPA 3010A	436528	EPA 6010D	436588
40257467003	MW-315	EPA 3010A	436528	EPA 6010D	436588
40257467004	FIELD BLANK MOD 10-11	EPA 3010A	436528	EPA 6010D	436588
40257467001	MW-313	EPA 3010A	436525	EPA 6020B	436664
40257467002	MW-314	EPA 3010A	436525	EPA 6020B	436664
40257467003	MW-315	EPA 3010A	436525	EPA 6020B	436664
40257467004	FIELD BLANK MOD 10-11	EPA 3010A	436525	EPA 6020B	436664
40257467001	MW-313	EPA 7470	436656	EPA 7470	436678
40257467002	MW-314	EPA 7470	436656	EPA 7470	436678
40257467003	MW-315	EPA 7470	436656	EPA 7470	436678
40257467004	FIELD BLANK MOD 10-11	EPA 7470	436656	EPA 7470	436678
40257467001	MW-313				
40257467002	MW-314				
40257467003	MW-315				
40257467001	MW-313	EPA 903.1	563007		
40257467002	MW-314	EPA 903.1	563007		
40257467003	MW-315	EPA 903.1	563007		
40257467001	MW-313	EPA 904.0	563008		
40257467002	MW-314	EPA 904.0	563008		
40257467003	MW-315	EPA 904.0	563008		
40257467001	MW-313	Total Radium Calculation	579183		
40257467002	MW-314	Total Radium Calculation	579183		
40257467003	MW-315	Total Radium Calculation	579183		
40257467001	MW-313	SM 2540C	436574		
40257467002	MW-314	SM 2540C	436574		
40257467003	MW-315	SM 2540C	436574		
40257467004	FIELD BLANK MOD 10-11	SM 2540C	436574		
40257467001	MW-313	EPA 9040	436819		
40257467002	MW-314	EPA 9040	436819		
40257467003	MW-315	EPA 9040	436819		
40257467004	FIELD BLANK MOD 10-11	EPA 9040	436819		
40257467001	MW-313	EPA 300.0	436611		
40257467002	MW-314	EPA 300.0	436611		
40257467003	MW-315	EPA 300.0	436611		
40257467004	FIELD BLANK MOD 10-11	EPA 300.0	436611		
40257467001	MW-313	EPA 310.2	436488		
40257467002	MW-314	EPA 310.2	436488		
40257467003	MW-315	EPA 310.2	436488		
40257467004	FIELD BLANK MOD 10-11	EPA 310.2	436488		
40257467001	MW-313	EPA 353.2	436754		
40257467002	MW-314	EPA 353.2	436754		
40257467003	MW-315	EPA 353.2	436754		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 COL CCR MOD10-11
Pace Project No.: 40257467

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40257467004	FIELD BLANK MOD 10-11	EPA 353.2	436754		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40257467

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers Billing Information: 25222157

Address: 2830 Davy Dr, Mead, WI

Report To: Meghan Blodgett 53718 Email To: mblodgett@scsengineers.com

Copy To: Site Collection Info/Address:

Container Preservative Type **

Lab Project Manager:

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

Customer Project Name/Number: State: County/City: Time Zone Collected: [] PT [] MT [] CT [] ET

Phone: 414-597-4253 Site/Facility ID #: Compliance Monitoring? [] Yes [] No

Email: eschroeder@scsengineers.com

Collected By (print): Damon Schroeder Purchase Order #: DW PWS ID #: DW Location Code:

Collected By (signature): [Signature] Turnaround Date Required: Immediately Packed on Ice: [] Yes [] No

Sample Disposal: Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply)

[] Dispose as appropriate [] Return [] Archive: [] Hold

Field Filtered (if applicable): [] Yes [] No Analysis:

Analyses										Lab Profile/Line:
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Lab Sample Receipt Checklist:
<u>Chloride, Fluoride, Sulfate</u> <u>TDS, pH, alkalinity</u> <u>Metals, hardness</u> <u>Nitrate+Nitrite by 353.2</u> <u>Radium 226</u> <u>Radium 228</u>										Custody Seals Present/Intact Y N NA
										Custody Signatures Present Y N NA
										Collector Signature Present Y N NA
										Bottles Intact Y N NA
										Correct Bottles Y N NA
										Sufficient Volume Y N NA
										Samples Received on Ice Y N NA
										VOA - Headspace Acceptable Y N NA
										USDA Regulated Soils Y N NA
										Samples in Holding Time Y N NA
Residual Chlorine Present Y N NA										
Cl Strips: _____										
Sample pH Acceptable Y N NA										
pH Strips: _____										
Sulfide Present Y N NA										
Lead Acetate Strips: _____										

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns											
			Date	Time	Date	Time													
MW-313	GW	G	1/24/23	1145				6	X	X	X	X	X	X	X	X	X	X	CO1
MW-314	GW	G	1/24	1025				6	X	X	X	X	X	X	X	X	X	X	CO2
MW-315	GW	G	1/24	1200				6	X	X	X	X	X	X	X	X	X	X	CO3
Field Blank 110D10-11		G	1/24	1230				4	X	X	X	X							CO4

Customer Remarks / Special Conditions / Possible Hazards: Type of Ice Used: Wet Blue Dry None

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

Lab Tracking #: 2824299

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

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info: Temp Blank Received: Y N NA

Therm ID#: _____

Cooler 1 Temp Upon Receipt: _____ oC

Cooler 1 Therm Corr. Factor: _____ oC

Cooler 1 Corrected Temp: _____ oC

Comments:

Relinquished by/Company: (Signature) <u>[Signature] SCS</u>	Date/Time: <u>1/24/23/400</u>	Received by/Company: (Signature)	Date/Time:	MTJL LAB USE ONLY
Relinquished by/Company: (Signature) <u>CS Logistics</u>	Date/Time: <u>1/25/23 0800</u>	Received by/Company: (Signature) <u>[Signature]</u>	Date/Time: <u>1/25/23 0800</u>	Table #:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Acctnum:
				Template:
				Prelogin:
				PM:
				PB:

Non Conformance(s): YES / NO

Page 31 of 34 of: _____

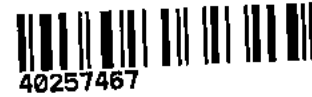
Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS

WO#: **40257467**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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. 3.0 /Corr 3.0

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

Person examining contents:
 Date: 1/25/23 Initials: mt
 Labeled By Initials: YJA

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

Chain of Custody Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>pg # mt 1/25/23</u>
Chain of Custody Relinquished: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt <input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time.
Short Hold Time Analysis (<72hr): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay, Pace IR, Non-Pace</u>	
Containers Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: <u>mt 1/25/23</u> <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A -Includes date/time/ID/Analysis Matrix: <u>W</u>	12. <u>CSI has a variation of times mt 1/25/23</u>
Trip Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 log

**Table 2. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Columbia Energy Center / SCS Engineers Project #25219067**

Parameter	Landfill Modules 10-11					
	MW-313	MW-314	MW-315	FIELD BLANK-MOD10-11		
Lab Parameters	Appendix III Parameters (Detection Monitoring)	Boron	X	X	X	X
		Calcium	X	X	X	X
		Chloride	X	X	X	X
		Fluoride	X	X	X	X
		pH	X	X	X	X
		Sulfate	X	X	X	X
		TDS	X	X	X	X
	Appendix IV Parameters (Assessment Monitoring)	Antimony	X	X	X	X
		Arsenic	X	X	X	X
		Barium	X	X	X	X
		Beryllium	X	X	X	X
		Cadmium	X	X	X	X
		Chromium	X	X	X	X
		Cobalt	X	X	X	X
		Fluoride	X	X	X	X
Field Parameters	Additional WDNR Parameters	Lead	X	X	X	X
		Lithium	X	X	X	X
		Mercury	X	X	X	X
		Molybdenum	X	X	X	X
		Selenium	X	X	X	X
		Thallium	X	X	X	X
		Radium 226+228	X	X	X	X
		Alkalinity	X	X	X	X
		Hardness	X	X	X	X
		Nitrate + Nitrite as N	X	X	X	X
		Copper	X	X	X	X
		Manganese	X	X	X	X
	Silver	X	X	X	X	
	Zinc	X	X	X	X	
	CCR Rule Field Parameters	Groundwater Elevation	X	X	X	
pH		X	X	X		
Low-Flow Sampling Parameters	Specific Conductance	X	X	X		
	Dissolved Oxygen	X	X	X		
	ORP	X	X	X		
	Temperature	X	X	X		
	Turbidity	X	X	X		
	Color	X	X	X		
Odor	X	X	X			

Notes: All samples are unfiltered (total).

X:\reports\40257\40257467\2023 Mod 10 11_COL_CCR.xls\Sheet1

March 20, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

Dear Meghan Blodgett:

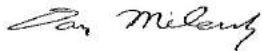
Enclosed are the analytical results for sample(s) received by the laboratory on February 24, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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
Sherren Clark, SCS Engineers
Jenny Coughlin, Alliant Energy
Tom Karwoski, SCS ENGINEERS
Ryan Matzuk, SCS Engineers
Jeff Maxted, ALLIANT ENERGY



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40258611001	MW-313	Water	02/23/23 13:30	02/24/23 07:30
40258611002	MW-314	Water	02/23/23 12:00	02/24/23 07:30
40258611003	MW-315	Water	02/23/23 13:20	02/24/23 07:30
40258611004	FIELD BLANK MOD 10-11	Water	02/23/23 13:50	02/24/23 07:30

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40258611001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40258611002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS			14	PASI-G
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	GDH			1	PASI-PA
EPA 904.0	JGH			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	YER			1	PASI-G
EPA 300.0	HMB			3	PASI-G
EPA 310.2	DAW			1	PASI-G
EPA 353.2	DAW			1	PASI-G
40258611003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40258611004	FIELD BLANK MOD 10-11	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-313 Lab ID: 40258611001 Collected: 02/23/23 13:30 Received: 02/24/23 07:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	02/28/23 05:36	02/28/23 17:12	7440-50-8	
Manganese	151	ug/L	5.0	1.5	1	02/28/23 05:36	02/28/23 17:12	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	02/28/23 05:36	02/28/23 17:12	7440-22-4	
Total Hardness by 2340B	324	mg/L	5.4	1.0	1	02/28/23 05:36	02/28/23 17:12		
Zinc	<11.6	ug/L	40.0	11.6	1	03/03/23 05:15	03/06/23 15:56	7440-66-6	
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	02/28/23 06:45	03/02/23 10:49	7440-36-0	
Arsenic	0.35J	ug/L	1.0	0.28	1	02/28/23 06:45	03/02/23 10:49	7440-38-2	
Barium	55.9	ug/L	2.3	0.70	1	02/28/23 06:45	03/02/23 10:49	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	02/28/23 06:45	03/02/23 10:49	7440-41-7	
Boron	46.6	ug/L	10.0	3.0	1	02/28/23 06:45	03/02/23 10:49	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	02/28/23 06:45	03/02/23 10:49	7440-43-9	
Calcium	62900	ug/L	2540	762	10	02/28/23 06:45	03/02/23 08:54	7440-70-2	P6
Chromium	<1.0	ug/L	3.4	1.0	1	02/28/23 06:45	03/02/23 10:49	7440-47-3	
Cobalt	0.16J	ug/L	1.0	0.12	1	02/28/23 06:45	03/02/23 10:49	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	02/28/23 06:45	03/02/23 10:49	7439-92-1	
Lithium	0.46J	ug/L	1.0	0.22	1	02/28/23 06:45	03/02/23 10:49	7439-93-2	
Molybdenum	2.0	ug/L	1.5	0.44	1	02/28/23 06:45	03/02/23 10:49	7439-98-7	
Selenium	0.55J	ug/L	1.1	0.32	1	02/28/23 06:45	03/02/23 10:49	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/28/23 06:45	03/02/23 10:49	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	02/28/23 11:10	03/01/23 07:44	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.35	Std. Units			1		02/23/23 13:30		
Field Specific Conductance	557.9	umhos/cm			1		02/23/23 13:30		
Oxygen, Dissolved	5.51	mg/L			1		02/23/23 13:30	7782-44-7	
REDOX	56.9	mV			1		02/23/23 13:30		
Turbidity	1.25	NTU			1		02/23/23 13:30		
Static Water Level	783.59	feet			1		02/23/23 13:30		
Temperature, Water (C)	10.0	deg C			1		02/23/23 13:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	278	mg/L	20.0	8.7	1		03/01/23 13:27		
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		02/28/23 10:52		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-313 **Lab ID: 40258611001** Collected: 02/23/23 13:30 Received: 02/24/23 07:30 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	<0.43	mg/L	2.0	0.43	1		03/02/23 14:02	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		03/02/23 14:02	16984-48-8	
Sulfate	7.1	mg/L	2.0	0.44	1		03/02/23 14:02	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	305	mg/L	25.0	7.4	1		03/06/23 10:13		
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	4.1	mg/L	0.25	0.059	1		03/01/23 10:51		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

Sample: MW-314 **Lab ID: 40258611002** Collected: 02/23/23 12:00 Received: 02/24/23 07:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	02/28/23 05:36	02/28/23 17:13	7440-50-8	
Manganese	52.1	ug/L	5.0	1.5	1	02/28/23 05:36	02/28/23 17:13	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	02/28/23 05:36	02/28/23 17:13	7440-22-4	
Total Hardness by 2340B	439	mg/L	5.4	1.0	1	02/28/23 05:36	02/28/23 17:13		
Zinc	<11.6	ug/L	40.0	11.6	1	03/03/23 05:15	03/06/23 15:58	7440-66-6	
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	02/28/23 06:45	03/02/23 11:19	7440-36-0	
Arsenic	0.41J	ug/L	1.0	0.28	1	02/28/23 06:45	03/02/23 11:19	7440-38-2	
Barium	43.4	ug/L	2.3	0.70	1	02/28/23 06:45	03/02/23 11:19	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	02/28/23 06:45	03/02/23 11:19	7440-41-7	
Boron	13.0	ug/L	10.0	3.0	1	02/28/23 06:45	03/02/23 11:19	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	02/28/23 06:45	03/02/23 11:19	7440-43-9	
Calcium	96200	ug/L	254	76.2	1	02/28/23 06:45	03/02/23 11:19	7440-70-2	
Chromium	1.0J	ug/L	3.4	1.0	1	02/28/23 06:45	03/02/23 11:19	7440-47-3	
Cobalt	0.22J	ug/L	1.0	0.12	1	02/28/23 06:45	03/02/23 11:19	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	02/28/23 06:45	03/02/23 11:19	7439-92-1	
Lithium	0.58J	ug/L	1.0	0.22	1	02/28/23 06:45	03/02/23 11:19	7439-93-2	
Molybdenum	1.4J	ug/L	1.5	0.44	1	02/28/23 06:45	03/02/23 11:19	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/28/23 06:45	03/02/23 11:19	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/28/23 06:45	03/02/23 11:19	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	02/28/23 11:10	03/01/23 07:51	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.23	Std. Units			1		02/23/23 12:00		
Field Specific Conductance	804.0	umhos/cm			1		02/23/23 12:00		
Oxygen, Dissolved	5.8	mg/L			1		02/23/23 12:00	7782-44-7	
REDOX	125.3	mV			1		02/23/23 12:00		
Turbidity	2.62	NTU			1		02/23/23 12:00		
Static Water Level	783.82	feet			1		02/23/23 12:00		
Temperature, Water (C)	9.9	deg C			1		02/23/23 12:00		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	396	mg/L	20.0	8.7	1		03/01/23 13:28		
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		02/28/23 10:55		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-314 **Lab ID: 40258611002** Collected: 02/23/23 12:00 Received: 02/24/23 07:30 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	2.2	mg/L	2.0	0.43	1		03/02/23 14:15	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		03/02/23 14:15	16984-48-8	
Sulfate	4.2	mg/L	2.0	0.44	1		03/02/23 14:15	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	457	mg/L	25.0	7.4	1		03/06/23 10:14		
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	0.41	mg/L	0.25	0.059	1		03/01/23 10:52		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-315 Lab ID: 40258611003 Collected: 02/23/23 13:20 Received: 02/24/23 07:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	02/28/23 05:36	02/28/23 17:15	7440-50-8	
Manganese	38.3	ug/L	5.0	1.5	1	02/28/23 05:36	02/28/23 17:15	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	02/28/23 05:36	02/28/23 17:15	7440-22-4	
Total Hardness by 2340B	472	mg/L	5.4	1.0	1	02/28/23 05:36	02/28/23 17:15		
Zinc	<11.6	ug/L	40.0	11.6	1	03/03/23 05:15	03/06/23 16:00	7440-66-6	
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	02/28/23 06:45	03/02/23 11:48	7440-36-0	
Arsenic	0.49J	ug/L	1.0	0.28	1	02/28/23 06:45	03/02/23 11:48	7440-38-2	
Barium	46.4	ug/L	2.3	0.70	1	02/28/23 06:45	03/02/23 11:48	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	02/28/23 06:45	03/02/23 11:48	7440-41-7	
Boron	9.3J	ug/L	10.0	3.0	1	02/28/23 06:45	03/02/23 11:48	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	02/28/23 06:45	03/02/23 11:48	7440-43-9	
Calcium	100000	ug/L	254	76.2	1	02/28/23 06:45	03/02/23 11:48	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	02/28/23 06:45	03/02/23 11:48	7440-47-3	
Cobalt	0.12J	ug/L	1.0	0.12	1	02/28/23 06:45	03/02/23 11:48	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	02/28/23 06:45	03/02/23 11:48	7439-92-1	
Lithium	0.73J	ug/L	1.0	0.22	1	02/28/23 06:45	03/02/23 11:48	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	02/28/23 06:45	03/02/23 11:48	7439-98-7	
Selenium	0.52J	ug/L	1.1	0.32	1	02/28/23 06:45	03/02/23 11:48	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/28/23 06:45	03/02/23 11:48	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	02/28/23 11:10	03/01/23 07:53	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.16	Std. Units			1		02/23/23 13:20		
Field Specific Conductance	892	umhos/cm			1		02/23/23 13:20		
Oxygen, Dissolved	7.28	mg/L			1		02/23/23 13:20	7782-44-7	
REDOX	118.2	mV			1		02/23/23 13:20		
Turbidity	2.70	NTU			1		02/23/23 13:20		
Static Water Level	783.96	feet			1		02/23/23 13:20		
Temperature, Water (C)	10.0	deg C			1		02/23/23 13:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	448	mg/L	20.0	8.7	1		03/01/23 13:28		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		02/28/23 11:00		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-315 **Lab ID: 40258611003** Collected: 02/23/23 13:20 Received: 02/24/23 07:30 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	5.6	mg/L	2.0	0.43	1		03/02/23 14:28	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		03/02/23 14:28	16984-48-8	
Sulfate	8.7	mg/L	2.0	0.44	1		03/02/23 14:28	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	492	mg/L	50.0	14.9	2		03/06/23 10:15		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.77	mg/L	0.25	0.059	1		03/01/23 10:52		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: FIELD BLANK MOD 10-11 Lab ID: 40258611004 Collected: 02/23/23 13:50 Received: 02/24/23 07:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	02/28/23 05:36	02/28/23 17:17	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	02/28/23 05:36	02/28/23 17:17	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	02/28/23 05:36	02/28/23 17:17	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	02/28/23 05:36	02/28/23 17:17		
Zinc	<11.6	ug/L	40.0	11.6	1	03/03/23 05:15	03/06/23 16:02	7440-66-6	
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	02/28/23 06:45	03/02/23 10:35	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	02/28/23 06:45	03/02/23 10:35	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	02/28/23 06:45	03/02/23 10:35	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	02/28/23 06:45	03/02/23 10:35	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	02/28/23 06:45	03/02/23 10:35	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	02/28/23 06:45	03/02/23 10:35	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	02/28/23 06:45	03/02/23 10:35	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	02/28/23 06:45	03/02/23 10:35	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	02/28/23 06:45	03/02/23 10:35	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	02/28/23 06:45	03/02/23 10:35	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	02/28/23 06:45	03/02/23 10:35	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	02/28/23 06:45	03/02/23 10:35	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	02/28/23 06:45	03/02/23 10:35	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	02/28/23 06:45	03/02/23 10:35	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	02/28/23 11:10	03/01/23 07:55	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		03/01/23 13:28		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	5.1	Std. Units	0.10	0.010	1		02/28/23 11:58		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		03/02/23 15:23	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		03/02/23 15:23	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		03/02/23 15:23	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		03/06/23 10:16		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: FIELD BLANK MOD 10-11 **Lab ID: 40258611004** Collected: 02/23/23 13:50 Received: 02/24/23 07:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		03/01/23 10:55		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch:	438803	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2520927 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	03/01/23 07:28	

LABORATORY CONTROL SAMPLE: 2520928

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: 2520929 2520930

Parameter	Units	40258657001 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	4.6	4.7	92	94	85-115	3	20	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch:	438752	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2520746 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	9.8J	10.0	03/01/23 13:43	
Manganese	ug/L	<1.5	5.0	03/01/23 13:43	
Silver	ug/L	<3.2	10.0	03/01/23 13:43	
Total Hardness by 2340B	mg/L	<1.0	5.4	03/01/23 13:43	

LABORATORY CONTROL SAMPLE: 2520747

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	264	106	80-120	
Manganese	ug/L	250	265	106	80-120	
Silver	ug/L	125	126	101	80-120	
Total Hardness by 2340B	mg/L		68.1			

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2520748 2520749

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258610003 Result	Spike Conc.	Spike Conc.	Result						
Copper	ug/L	<3.4	250	250	262	262	104	104	75-125	0	20
Manganese	ug/L	1.6J	250	250	265	265	106	105	75-125	0	20
Silver	ug/L	<3.2	125	125	128	127	102	102	75-125	0	20
Total Hardness by 2340B	mg/L	279			352	351				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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

QC Batch: 438996 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010D MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2521940 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Zinc	ug/L	<11.6	40.0	03/06/23 15:22	

LABORATORY CONTROL SAMPLE: 2521941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Zinc	ug/L	250	266	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2521942 2521943

Parameter	Units	2521942		2521943		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258610004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Zinc	ug/L	<11.6	250	250	259	257	103	102	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch: 438772

Analysis Method: EPA 6020B

QC Batch Method: EPA 3010A

Analysis Description: 6020B MET

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2520811

Matrix: Water

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	03/02/23 08:40	
Arsenic	ug/L	<0.28	1.0	03/02/23 08:40	
Barium	ug/L	<0.70	2.3	03/02/23 08:40	
Beryllium	ug/L	<0.25	1.0	03/02/23 08:40	
Boron	ug/L	<3.0	10.0	03/02/23 08:40	
Cadmium	ug/L	<0.15	1.0	03/02/23 08:40	
Calcium	ug/L	<76.2	254	03/02/23 08:40	
Chromium	ug/L	<1.0	3.4	03/02/23 08:40	
Cobalt	ug/L	<0.12	1.0	03/02/23 08:40	
Lead	ug/L	<0.24	1.0	03/02/23 08:40	
Lithium	ug/L	<0.22	1.0	03/02/23 08:40	
Molybdenum	ug/L	<0.44	1.5	03/02/23 08:40	
Selenium	ug/L	<0.32	1.1	03/02/23 08:40	
Thallium	ug/L	<0.14	1.0	03/02/23 08:40	

LABORATORY CONTROL SAMPLE: 2520812

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	247	99	80-120	
Arsenic	ug/L	250	247	99	80-120	
Barium	ug/L	250	234	93	80-120	
Beryllium	ug/L	250	256	103	80-120	
Boron	ug/L	250	217	87	80-120	
Cadmium	ug/L	250	242	97	80-120	
Calcium	ug/L	10000	9760	98	80-120	
Chromium	ug/L	250	242	97	80-120	
Cobalt	ug/L	250	239	95	80-120	
Lead	ug/L	250	244	98	80-120	
Lithium	ug/L	250	245	98	80-120	
Molybdenum	ug/L	250	240	96	80-120	
Selenium	ug/L	250	264	106	80-120	
Thallium	ug/L	250	245	98	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2520813		2520814		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258611001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	<0.15	250	250	254	248	102	99	75-125	2	20		
Arsenic	ug/L	0.35J	250	250	250	245	100	98	75-125	2	20		
Barium	ug/L	55.9	250	250	303	294	99	95	75-125	3	20		
Beryllium	ug/L	<0.25	250	250	251	237	101	95	75-125	6	20		
Boron	ug/L	46.6	250	250	260	246	86	80	75-125	6	20		
Cadmium	ug/L	<0.15	250	250	256	240	102	96	75-125	6	20		
Calcium	ug/L	62900	10000	10000	74600	69700	117	68	75-125	7	20	P6	
Chromium	ug/L	<1.0	250	250	247	239	98	95	75-125	3	20		
Cobalt	ug/L	0.16J	250	250	239	234	96	93	75-125	2	20		
Lead	ug/L	<0.24	250	250	255	250	102	100	75-125	2	20		
Lithium	ug/L	0.46J	250	250	246	236	98	94	75-125	4	20		
Molybdenum	ug/L	2.0	250	250	244	240	97	95	75-125	2	20		
Selenium	ug/L	0.55J	250	250	266	260	106	104	75-125	2	20		
Thallium	ug/L	<0.14	250	250	255	248	102	99	75-125	3	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

QC Batch: 438916 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2521493 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	03/01/23 13:27	

LABORATORY CONTROL SAMPLE: 2521494

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	540	514	95	80-120	

SAMPLE DUPLICATE: 2521495

Parameter	Units	40258611001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	278	290	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch: 438757	Analysis Method: EPA 9040
QC Batch Method: EPA 9040	Analysis Description: 9040 pH
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

SAMPLE DUPLICATE: 2520759

Parameter	Units	40258366001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	20	H6

SAMPLE DUPLICATE: 2520760

Parameter	Units	40258512001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.4	6.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

QC Batch: 438640 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: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2520461 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	02/28/23 19:51	
Fluoride	mg/L	<0.095	0.32	02/28/23 19:51	
Sulfate	mg/L	<0.44	2.0	02/28/23 19:51	

LABORATORY CONTROL SAMPLE: 2520462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.9	104	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	18.4	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2520463 2520464

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258595001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	22.0	20	20	41.1	41.4	95	97	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	104	105	90-110	1	15		
Sulfate	mg/L	7.7	20	20	26.1	26.4	92	93	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

QC Batch: 439129 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: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2522651 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	03/06/23 09:55	

LABORATORY CONTROL SAMPLE: 2522652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	105	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2522653 2522654

Parameter	Units	2522653		2522654		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Alkalinity, Total as CaCO3	mg/L	249	200	200	460	451	105	101	90-110	2	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2522655 2522656

Parameter	Units	2522655		2522656		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Alkalinity, Total as CaCO3	mg/L	406	200	200	602	598	98	96	90-110	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

QC Batch: 438850 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2521071 Matrix: Water
Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	03/01/23 10:36	

LABORATORY CONTROL SAMPLE: 2521072

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2521073 2521074

Parameter	Units	2521073		2521074		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258610007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	1.8	2.5	2.5	4.2	4.1	97	95	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2521075 2521076

Parameter	Units	2521075		2521076		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40258611003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	0.77	2.5	2.5	3.3	3.2	99	96	90-110	2	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-313 **Lab ID: 40258611001** Collected: 02/23/23 13:30 Received: 02/24/23 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	-0.130 ± 0.539 (1.13) C:NA T:99%	pCi/L	03/12/23 13:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.346 ± 0.347 (0.711) C:73% T:88%	pCi/L	03/10/23 15:55	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.346 ± 0.886 (1.84)	pCi/L	03/16/23 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-314 **Lab ID: 40258611002** Collected: 02/23/23 12:00 Received: 02/24/23 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.233 ± 0.458 (0.838) C:NA T:97%	pCi/L	03/12/23 13:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.0135 ± 0.285 (0.667) C:74% T:99%	pCi/L	03/10/23 15:55	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.247 ± 0.743 (1.51)	pCi/L	03/16/23 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: MW-315 **Lab ID: 40258611003** Collected: 02/23/23 13:20 Received: 02/24/23 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.149 ± 0.414 (0.803) C:NA T:101%	pCi/L	03/12/23 13:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.224 ± 0.365 (0.793) C:71% T:92%	pCi/L	03/10/23 15:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.373 ± 0.779 (1.60)	pCi/L	03/16/23 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Sample: FIELD BLANK MOD 10-11 **Lab ID:** 40258611004 Collected: 02/23/23 13:50 Received: 02/24/23 07:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.462 ± 0.595 (0.991) C:NA T:99%	pCi/L	03/12/23 13:59	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.270 ± 0.350 (0.743) C:73% T:86%	pCi/L	03/10/23 15:56	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.732 ± 0.945 (1.73)	pCi/L	03/16/23 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch: 570529

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: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2770209

Matrix: Water

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.200 ± 0.312 (0.674) C:71% T:86%	pCi/L	03/10/23 15:53	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

QC Batch: 570528

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: 40258611001, 40258611002, 40258611003, 40258611004

METHOD BLANK: 2770205

Matrix: Water

Associated Lab Samples: 40258611001, 40258611002, 40258611003, 40258611004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.190 ± 0.330 (0.589) C:NA T:96%	pCi/L	03/12/23 13:28	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157.00 COL CCR MOD10-11
Pace Project No.: 40258611

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40258611001	MW-313	EPA 3010A	438752	EPA 6010D	438851
40258611001	MW-313	EPA 3010A	438996	EPA 6010D	439134
40258611002	MW-314	EPA 3010A	438752	EPA 6010D	438851
40258611002	MW-314	EPA 3010A	438996	EPA 6010D	439134
40258611003	MW-315	EPA 3010A	438752	EPA 6010D	438851
40258611003	MW-315	EPA 3010A	438996	EPA 6010D	439134
40258611004	FIELD BLANK MOD 10-11	EPA 3010A	438752	EPA 6010D	438851
40258611004	FIELD BLANK MOD 10-11	EPA 3010A	438996	EPA 6010D	439134
40258611001	MW-313	EPA 3010A	438772	EPA 6020B	438845
40258611002	MW-314	EPA 3010A	438772	EPA 6020B	438845
40258611003	MW-315	EPA 3010A	438772	EPA 6020B	438845
40258611004	FIELD BLANK MOD 10-11	EPA 3010A	438772	EPA 6020B	438845
40258611001	MW-313	EPA 7470	438803	EPA 7470	438834
40258611002	MW-314	EPA 7470	438803	EPA 7470	438834
40258611003	MW-315	EPA 7470	438803	EPA 7470	438834
40258611004	FIELD BLANK MOD 10-11	EPA 7470	438803	EPA 7470	438834
40258611001	MW-313				
40258611002	MW-314				
40258611003	MW-315				
40258611001	MW-313	EPA 903.1	570528		
40258611002	MW-314	EPA 903.1	570528		
40258611003	MW-315	EPA 903.1	570528		
40258611004	FIELD BLANK MOD 10-11	EPA 903.1	570528		
40258611001	MW-313	EPA 904.0	570529		
40258611002	MW-314	EPA 904.0	570529		
40258611003	MW-315	EPA 904.0	570529		
40258611004	FIELD BLANK MOD 10-11	EPA 904.0	570529		
40258611001	MW-313	Total Radium Calculation	574305		
40258611002	MW-314	Total Radium Calculation	574305		
40258611003	MW-315	Total Radium Calculation	574305		
40258611004	FIELD BLANK MOD 10-11	Total Radium Calculation	574305		
40258611001	MW-313	SM 2540C	438916		
40258611002	MW-314	SM 2540C	438916		
40258611003	MW-315	SM 2540C	438916		
40258611004	FIELD BLANK MOD 10-11	SM 2540C	438916		
40258611001	MW-313	EPA 9040	438757		
40258611002	MW-314	EPA 9040	438757		
40258611003	MW-315	EPA 9040	438757		
40258611004	FIELD BLANK MOD 10-11	EPA 9040	438757		
40258611001	MW-313	EPA 300.0	438640		
40258611002	MW-314	EPA 300.0	438640		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157.00 COL CCR MOD10-11

Pace Project No.: 40258611

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40258611003	MW-315	EPA 300.0	438640		
40258611004	FIELD BLANK MOD 10-11	EPA 300.0	438640		
40258611001	MW-313	EPA 310.2	439129		
40258611002	MW-314	EPA 310.2	439129		
40258611003	MW-315	EPA 310.2	439129		
40258611004	FIELD BLANK MOD 10-11	EPA 310.2	439129		
40258611001	MW-313	EPA 353.2	438850		
40258611002	MW-314	EPA 353.2	438850		
40258611003	MW-315	EPA 353.2	438850		
40258611004	FIELD BLANK MOD 10-11	EPA 353.2	438850		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

U0258611

Company: SCS Engineers Billing Information: 25222157.00

Address: 2830 Daring Dr, Marsh WI 53718

Report To: Meghan Blodgett Email To: Mblodgett@scsengineers.com

Copy To:

Site Collection Info/Address:

ALL SHADED AREAS are for LAB USE ONLY

Container Preservative Type **
 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N O

Lab Project Manager:

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

Customer Project Name/Number: State: WI County/City: Time Zone Collected: [] PT [] MT [] CT [] ET

Phone: 414-897-4253 Site/Facility ID #: Compliance Monitoring? [] Yes [] No

Email: eschaefer@scsengineers.com

Collected By (print): Ethan Schookes Purchase Order #: DW PWS ID #: DW Location Code:

Collected By (signature): [Signature] Quote #: Turnaround Date Required: Immediately Packed on Ice: [] Yes [] No

Sample Disposal: [] Dispose as appropriate [] Return [] Archive [] Hold Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply) Field Filtered (if applicable): [] Yes [] No Analysis:

Analyses

Leadium 226+228	Nitrate+Ammonia	Metals + Hardness	TDS, pH, alkalinity	Chloride, Fluoride, Sulfate
-----------------	-----------------	-------------------	---------------------	-----------------------------

Lab Profile/Line:

Lab Sample Receipt Checklist:

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

LAB USE ONLY:
Lab Sample # / Comments:

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns
			Date	Time	Date	Time		
MW-313	GW	6	2/23	1330				6
MW-314	GW	6	2/23	1200				6
MW-315	GW	6	2/23	1320				6
Field Blank Mod10-11			2/23	1350				6

LAB USE ONLY:
Lab Sample # / Comments:

001
002
003
004

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

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

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

Lab Tracking #: 2824347

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#

Cooler 1 Temp Upon Receipt: 10°C

Cooler 1 Therm Corr. Factor: 1.2°C

Cooler 1 Corrected Temp: 11.2°C

Comments: [Signature]

Relinquished by/Company: (Signature) [Signature] Date/Time: 2/23/23 1530

Received by/Company: (Signature) [Signature] Date/Time: 2/24/23 0730

Relinquished by/Company: (Signature) CS Logistics Date/Time: 2/24/23 0730

Received by/Company: (Signature) [Signature] Date/Time: 2/24/23 0730

Relinquished by/Company: (Signature) [Signature] Date/Time: 02/26/2024

Received by/Company: (Signature) [Signature] Date/Time: 02/26/2024

MTJL LAB USE ONLY

Table #:

Acctnum:

Template:

Prelogin:

PM:

PB:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s): YES NO

Page 33 of 35 of:

Effective Date: 8/16/2022

Client Name: SCS Engineers

Sample Preservation Receipt Form
Project # U0258611

All containers needing preservation have been checked and noted below

Yes No N/A

Lab Lot# of pH paper: 1000722

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

Initial when completed YN

Date/Time:

Pace Lab #	Glass						Plastic						Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≤9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)								
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T								ZPLC	GN 1	GN 2					
001								2																2														2.5/5
002								2																														2.5/5
003								2																														2.5/5
004								2																														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

YH 2/20/23

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 MaOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1L poly HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SCS Engineers

WO#: **40258611**

Courier: CS Logistics Fed Ex Speedee UPS Walto
 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 - 125 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr 3.0 ICorr. 3.0

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: 2/24/23 Initials: GA
 Labeled By Initials: mt

Chain of Custody Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>pg# ym 2/24/23</u>
Chain of Custody Relinquished: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt <input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time
Short Hold Time Analysis (<72hr): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> , Pace IR, Non-Pace	
Containers Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	11.
Sample Labels match COC: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>1001" Client labeled various times on labels from 1320-1332. ym mt 2/24/23</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>	
Trip Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 logir

April 24, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on March 29, 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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Florida: Cert E871149 SEKS WET
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40259992001	MW-313	Water	03/27/23 10:30	03/29/23 09:45
40259992002	MW-314	Water	03/27/23 11:20	03/29/23 09:45
40259992003	MW-315	Water	03/27/23 12:15	03/29/23 09:45
40259992004	FIELD BLANK MOD 10-11	Water	03/27/23 11:30	03/29/23 09:45

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40259992001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40259992002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS			14	PASI-G
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	GDH			1	PASI-PA
EPA 904.0	JGH			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	SRK			1	PASI-G
EPA 9040	YER			1	PASI-G
EPA 300.0	HMB			3	PASI-G
EPA 310.2	DAW			1	PASI-G
EPA 353.2	DAW			1	PASI-G
40259992003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G
		40259992004	FIELD BLANK MOD 10-11	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	GDH	1	PASI-PA
		EPA 904.0	JGH	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	DAW	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-313 Lab ID: 40259992001 Collected: 03/27/23 10:30 Received: 03/29/23 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	03/31/23 05:16	03/31/23 15:50	7440-50-8	
Manganese	86.4	ug/L	5.0	1.5	1	03/31/23 05:16	03/31/23 15:50	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	03/31/23 05:16	03/31/23 15:50	7440-22-4	
Total Hardness by 2340B	318	mg/L	27.0	5.0	5	03/31/23 05:16	04/03/23 12:44		
Zinc	<11.6	ug/L	40.0	11.6	1	03/31/23 05:16	03/31/23 15:50	7440-66-6	
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	03/31/23 06:18	04/04/23 00:26	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	03/31/23 06:18	04/04/23 00:26	7440-38-2	
Barium	47.3	ug/L	2.3	0.70	1	03/31/23 06:18	04/04/23 00:26	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	03/31/23 06:18	04/04/23 00:26	7440-41-7	
Boron	67.1	ug/L	10.0	3.0	1	03/31/23 06:18	04/04/23 00:26	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	03/31/23 06:18	04/04/23 00:26	7440-43-9	
Calcium	63300	ug/L	2540	762	10	03/31/23 06:18	04/03/23 17:24	7440-70-2	P6
Chromium	<1.0	ug/L	3.4	1.0	1	03/31/23 06:18	04/04/23 00:26	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	03/31/23 06:18	04/04/23 00:26	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	03/31/23 06:18	04/04/23 00:26	7439-92-1	
Lithium	0.46J	ug/L	1.0	0.22	1	03/31/23 06:18	04/04/23 00:26	7439-93-2	
Molybdenum	1.4J	ug/L	1.5	0.44	1	03/31/23 06:18	04/04/23 00:26	7439-98-7	
Selenium	0.49J	ug/L	1.1	0.32	1	03/31/23 06:18	04/04/23 00:26	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	03/31/23 06:18	04/04/23 00:26	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	04/03/23 08:31	04/04/23 07:15	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.40	Std. Units			1		03/27/23 10:30		
Field Specific Conductance	490.5	umhos/cm			1		03/27/23 10:30		
Oxygen, Dissolved	7.03	mg/L			1		03/27/23 10:30	7782-44-7	
REDOX	51.5	mV			1		03/27/23 10:30		
Turbidity	0.00	NTU			1		03/27/23 10:30		
Static Water Level	784.12	feet			1		03/27/23 10:30		
Temperature, Water (C)	10.0	deg C			1		03/27/23 10:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	320	mg/L	20.0	8.7	1		03/30/23 10:37		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		04/03/23 07:41		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-313 **Lab ID: 40259992001** Collected: 03/27/23 10:30 Received: 03/29/23 09:45 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	1.3J	mg/L	2.0	0.43	1		04/03/23 23:58	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		04/03/23 23:58	16984-48-8	
Sulfate	8.7	mg/L	2.0	0.44	1		04/03/23 23:58	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	286	mg/L	25.0	7.4	1		04/04/23 14:58		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	3.9	mg/L	0.25	0.059	1		04/06/23 10:20		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-314 **Lab ID: 40259992002** Collected: 03/27/23 11:20 Received: 03/29/23 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	03/31/23 05:16	03/31/23 15:58	7440-50-8	
Manganese	21.5	ug/L	5.0	1.5	1	03/31/23 05:16	03/31/23 15:58	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	03/31/23 05:16	03/31/23 15:58	7440-22-4	
Total Hardness by 2340B	460	mg/L	5.4	1.0	1	03/31/23 05:16	03/31/23 15:58		
Zinc	<11.6	ug/L	40.0	11.6	1	03/31/23 05:16	03/31/23 15:58	7440-66-6	
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	03/31/23 06:18	04/04/23 00:56	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	03/31/23 06:18	04/04/23 00:56	7440-38-2	
Barium	43.3	ug/L	2.3	0.70	1	03/31/23 06:18	04/04/23 00:56	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	03/31/23 06:18	04/04/23 00:56	7440-41-7	
Boron	15.2	ug/L	10.0	3.0	1	03/31/23 06:18	04/04/23 00:56	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	03/31/23 06:18	04/04/23 00:56	7440-43-9	
Calcium	99300	ug/L	254	76.2	1	03/31/23 06:18	04/04/23 00:56	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	03/31/23 06:18	04/04/23 00:56	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	03/31/23 06:18	04/04/23 00:56	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	03/31/23 06:18	04/04/23 00:56	7439-92-1	
Lithium	0.69J	ug/L	1.0	0.22	1	03/31/23 06:18	04/04/23 00:56	7439-93-2	
Molybdenum	1.5J	ug/L	1.5	0.44	1	03/31/23 06:18	04/04/23 00:56	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	03/31/23 06:18	04/04/23 00:56	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	03/31/23 06:18	04/04/23 00:56	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	04/03/23 08:31	04/04/23 07:17	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.25	Std. Units			1		03/27/23 11:20		
Field Specific Conductance	667.3	umhos/cm			1		03/27/23 11:20		
Oxygen, Dissolved	5.51	mg/L			1		03/27/23 11:20	7782-44-7	
REDOX	45.6	mV			1		03/27/23 11:20		
Turbidity	0.00	NTU			1		03/27/23 11:20		
Static Water Level	784.41	feet			1		03/27/23 11:20		
Temperature, Water (C)	10.0	deg C			1		03/27/23 11:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	412	mg/L	20.0	8.7	1		03/30/23 10:37		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.2	Std. Units	0.10	0.010	1		04/03/23 07:44		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-314 **Lab ID: 40259992002** Collected: 03/27/23 11:20 Received: 03/29/23 09:45 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	2.6	mg/L	2.0	0.43	1		04/17/23 14:18	16887-00-6	M0,R1
Fluoride	<0.095	mg/L	0.32	0.095	1		04/17/23 14:18	16984-48-8	M0,R1
Sulfate	5.0	mg/L	2.0	0.44	1		04/17/23 14:18	14808-79-8	M0,R1
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	414	mg/L	25.0	7.4	1		04/04/23 14:59		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.15J	mg/L	0.25	0.059	1		04/06/23 10:21		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

Sample: MW-315 **Lab ID: 40259992003** Collected: 03/27/23 12:15 Received: 03/29/23 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	03/31/23 05:16	03/31/23 16:02	7440-50-8	
Manganese	20.0	ug/L	5.0	1.5	1	03/31/23 05:16	03/31/23 16:02	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	03/31/23 05:16	03/31/23 16:02	7440-22-4	
Total Hardness by 2340B	486	mg/L	5.4	1.0	1	03/31/23 05:16	03/31/23 16:02		
Zinc	<11.6	ug/L	40.0	11.6	1	03/31/23 05:16	03/31/23 16:02	7440-66-6	
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	03/31/23 06:18	04/04/23 01:10	7440-36-0	
Arsenic	0.45J	ug/L	1.0	0.28	1	03/31/23 06:18	04/04/23 01:10	7440-38-2	
Barium	36.6	ug/L	2.3	0.70	1	03/31/23 06:18	04/04/23 01:10	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	03/31/23 06:18	04/04/23 01:10	7440-41-7	
Boron	11.9	ug/L	10.0	3.0	1	03/31/23 06:18	04/04/23 01:10	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	03/31/23 06:18	04/04/23 01:10	7440-43-9	
Calcium	106000	ug/L	254	76.2	1	03/31/23 06:18	04/04/23 01:10	7440-70-2	
Chromium	1.8J	ug/L	3.4	1.0	1	03/31/23 06:18	04/04/23 01:10	7440-47-3	
Cobalt	0.13J	ug/L	1.0	0.12	1	03/31/23 06:18	04/04/23 01:10	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	03/31/23 06:18	04/04/23 01:10	7439-92-1	
Lithium	0.85J	ug/L	1.0	0.22	1	03/31/23 06:18	04/04/23 01:10	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	03/31/23 06:18	04/04/23 01:10	7439-98-7	
Selenium	0.41J	ug/L	1.1	0.32	1	03/31/23 06:18	04/04/23 01:10	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	03/31/23 06:18	04/04/23 01:10	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	04/03/23 08:31	04/04/23 07:20	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.21	Std. Units			1		03/27/23 12:15		
Field Specific Conductance	711	umhos/cm			1		03/27/23 12:15		
Oxygen, Dissolved	7.83	mg/L			1		03/27/23 12:15	7782-44-7	
REDOX	45.8	mV			1		03/27/23 12:15		
Turbidity	0.00	NTU			1		03/27/23 12:15		
Static Water Level	784.57	feet			1		03/27/23 12:15		
Temperature, Water (C)	10.1	deg C			1		03/27/23 12:15		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	480	mg/L	20.0	8.7	1		03/30/23 10:37		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.4	Std. Units	0.10	0.010	1		04/03/23 07:50		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-315 **Lab ID: 40259992003** Collected: 03/27/23 12:15 Received: 03/29/23 09:45 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	6.0	mg/L	2.0	0.43	1		04/17/23 15:01	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		04/17/23 15:01	16984-48-8	
Sulfate	10.7	mg/L	2.0	0.44	1		04/17/23 15:01	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	451	mg/L	50.0	14.9	2		04/04/23 15:00		M0
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.72	mg/L	0.25	0.059	1		04/06/23 10:21		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: FIELD BLANK MOD 10-11 Lab ID: 40259992004 Collected: 03/27/23 11:30 Received: 03/29/23 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	03/31/23 05:16	03/31/23 16:04	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	03/31/23 05:16	03/31/23 16:04	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	03/31/23 05:16	03/31/23 16:04	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	03/31/23 05:16	03/31/23 16:04		
Zinc	<11.6	ug/L	40.0	11.6	1	03/31/23 05:16	03/31/23 16:04	7440-66-6	
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	03/31/23 06:18	04/04/23 01:18	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	03/31/23 06:18	04/04/23 01:18	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	03/31/23 06:18	04/04/23 01:18	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	03/31/23 06:18	04/04/23 01:18	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	03/31/23 06:18	04/04/23 01:18	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	03/31/23 06:18	04/04/23 01:18	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	03/31/23 06:18	04/04/23 01:18	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	03/31/23 06:18	04/04/23 01:18	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	03/31/23 06:18	04/04/23 01:18	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	03/31/23 06:18	04/04/23 01:18	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	03/31/23 06:18	04/04/23 01:18	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	03/31/23 06:18	04/04/23 01:18	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	03/31/23 06:18	04/04/23 01:18	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	03/31/23 06:18	04/04/23 01:18	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	04/03/23 08:31	04/04/23 07:27	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	16.0J	mg/L	20.0	8.7	1		03/30/23 10:37		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	5.9	Std. Units	0.10	0.010	1		04/03/23 07:57		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		04/17/23 15:15	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		04/17/23 15:15	16984-48-8	
Sulfate	0.47J	mg/L	2.0	0.44	1		04/17/23 15:15	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		04/04/23 15:03		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: FIELD BLANK MOD 10-11 **Lab ID: 40259992004** Collected: 03/27/23 11:30 Received: 03/29/23 09:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		04/06/23 10:23		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch:	441349	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2534533 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	04/04/23 06:59	

LABORATORY CONTROL SAMPLE: 2534534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2534535 2534536

Parameter	Units	40260143001		2534536		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury	ug/L	<0.066	5	5	5.4	5.3	108	106	85-115	2	20	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch:	441238	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2533505 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	<3.4	10.0	03/31/23 15:46	
Manganese	ug/L	<1.5	5.0	03/31/23 15:46	
Silver	ug/L	<3.2	10.0	03/31/23 15:46	
Total Hardness by 2340B	mg/L	<1.0	5.4	03/31/23 15:46	
Zinc	ug/L	<11.6	40.0	03/31/23 15:46	

LABORATORY CONTROL SAMPLE: 2533506

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	255	102	80-120	
Manganese	ug/L	250	259	104	80-120	
Silver	ug/L	125	124	99	80-120	
Total Hardness by 2340B	mg/L		66.1			
Zinc	ug/L	250	256	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2533507 2533508

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40259992001 Result	Spike Conc.	Spike Conc.	Result						
Copper	ug/L	<3.4	250	250	257	260	102	104	75-125	1	20
Manganese	ug/L	86.4	250	250	344	352	103	106	75-125	2	20
Silver	ug/L	<3.2	125	125	125	126	100	101	75-125	1	20
Total Hardness by 2340B	mg/L	318			379	402				6	20
Zinc	ug/L	<11.6	250	250	253	257	101	102	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

QC Batch: 441244 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2533532 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/03/23 17:09	
Arsenic	ug/L	<0.28	1.0	04/03/23 17:09	
Barium	ug/L	<0.70	2.3	04/03/23 17:09	
Beryllium	ug/L	<0.25	1.0	04/03/23 17:09	
Boron	ug/L	<3.0	10.0	04/03/23 17:09	
Cadmium	ug/L	<0.15	1.0	04/03/23 17:09	
Calcium	ug/L	<76.2	254	04/03/23 17:09	
Chromium	ug/L	<1.0	3.4	04/03/23 17:09	
Cobalt	ug/L	<0.12	1.0	04/03/23 17:09	
Lead	ug/L	<0.24	1.0	04/03/23 17:09	
Lithium	ug/L	<0.22	1.0	04/03/23 17:09	
Molybdenum	ug/L	<0.44	1.5	04/03/23 17:09	
Selenium	ug/L	<0.32	1.1	04/03/23 17:09	
Thallium	ug/L	<0.14	1.0	04/03/23 17:09	

LABORATORY CONTROL SAMPLE: 2533533

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	261	105	80-120	
Arsenic	ug/L	250	249	100	80-120	
Barium	ug/L	250	248	99	80-120	
Beryllium	ug/L	250	251	100	80-120	
Boron	ug/L	250	249	99	80-120	
Cadmium	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	9600	96	80-120	
Chromium	ug/L	250	252	101	80-120	
Cobalt	ug/L	250	252	101	80-120	
Lead	ug/L	250	242	97	80-120	
Lithium	ug/L	250	242	97	80-120	
Molybdenum	ug/L	250	244	98	80-120	
Selenium	ug/L	250	250	100	80-120	
Thallium	ug/L	250	245	98	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Parameter	Units	2533534		2533535		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40259992001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	<0.15	250	250	267	267	107	107	75-125	0	20		
Arsenic	ug/L	<0.28	250	250	250	251	100	100	75-125	1	20		
Barium	ug/L	47.3	250	250	296	296	99	100	75-125	0	20		
Beryllium	ug/L	<0.25	250	250	231	232	92	93	75-125	0	20		
Boron	ug/L	67.1	250	250	303	296	94	92	75-125	2	20		
Cadmium	ug/L	<0.15	250	250	249	252	100	101	75-125	1	20		
Calcium	ug/L	63300	10000	10000	76000	74300	127	110	75-125	2	20	P6	
Chromium	ug/L	<1.0	250	250	245	245	98	98	75-125	0	20		
Cobalt	ug/L	<0.12	250	250	240	240	96	96	75-125	0	20		
Lead	ug/L	<0.24	250	250	251	250	101	100	75-125	0	20		
Lithium	ug/L	0.46J	250	250	244	241	97	96	75-125	1	20		
Molybdenum	ug/L	1.4J	250	250	250	250	100	99	75-125	0	20		
Selenium	ug/L	0.49J	250	250	255	260	102	104	75-125	2	20		
Thallium	ug/L	<0.14	250	250	248	249	99	100	75-125	0	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

QC Batch: 441178 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2533004 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	03/30/23 10:30	

LABORATORY CONTROL SAMPLE: 2533005

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	549	584	106	80-120	

SAMPLE DUPLICATE: 2533006

Parameter	Units	40259908001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	684	706	3	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch: 441342 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

SAMPLE DUPLICATE: 2534517

Parameter	Units	40259877001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	20	H6

SAMPLE DUPLICATE: 2534614

Parameter	Units	40259904001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.8	5.4	6	20	1q,H6,PI

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch: 441321

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: 40259992001

METHOD BLANK: 2534008

Matrix: Water

Associated Lab Samples: 40259992001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/03/23 18:56	
Fluoride	mg/L	<0.095	0.32	04/03/23 18:56	
Sulfate	mg/L	<0.44	2.0	04/03/23 18:56	

LABORATORY CONTROL SAMPLE: 2534009

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.5	102	90-110	
Fluoride	mg/L	2	1.9	96	90-110	
Sulfate	mg/L	20	19.0	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2534010 2534011

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40259816006 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	148	200	200	351	351	102	101	90-110	0	15		
Fluoride	mg/L	<0.95	20	20	20.8	21.0	104	105	90-110	1	15		
Sulfate	mg/L	64.1	200	200	289	289	112	112	90-110	0	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch:	441977	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:	40259992002, 40259992003, 40259992004		

METHOD BLANK: 2537881 Matrix: Water
Associated Lab Samples: 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/17/23 13:49	
Fluoride	mg/L	<0.095	0.32	04/17/23 13:49	
Sulfate	mg/L	<0.44	2.0	04/17/23 13:49	

LABORATORY CONTROL SAMPLE: 2537882

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	18.8	94	90-110	
Fluoride	mg/L	2	1.9	96	90-110	
Sulfate	mg/L	20	18.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2537883 2537884

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40259992002 Result	Spike Conc.	Spike Conc.	Conc.								
Chloride	mg/L	2.6	20	20	20	18.1	24.4	77	109	90-110	29	15	M0,R1
Fluoride	mg/L	<0.095	2	2	2	1.7	2.3	85	114	90-110	29	15	M0,R1
Sulfate	mg/L	5.0	20	20	20	19.9	26.9	75	109	90-110	30	15	M0,R1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2537885 2537886

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40260038001 Result	Spike Conc.	Spike Conc.	Conc.								
Chloride	mg/L	4.8	20	20	20	26.6	26.6	109	109	90-110	0	15	
Fluoride	mg/L	<0.095	2	2	2	2.3	2.3	113	113	90-110	0	15	M0
Sulfate	mg/L	17.0	20	20	20	38.7	38.7	108	108	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch:	441538	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: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2535254 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	04/04/23 14:51	

LABORATORY CONTROL SAMPLE: 2535255

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	95.5	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2535256 2535257

Parameter	Units	2535256		2535257		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40259992003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Alkalinity, Total as CaCO3	mg/L	451	200	200	627	630	88	89	90-110	0	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch:	441665	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2535928 Matrix: Water
Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	04/06/23 10:03	

LABORATORY CONTROL SAMPLE: 2535929

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2535930 2535931

Parameter	Units	40259827005		2535931		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.							
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.4	2.4	95	95	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2535932 2535933

Parameter	Units	40259992003		2535933		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.							
Nitrogen, NO2 plus NO3	mg/L	0.72	2.5	3.1	3.1	94	94	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-313 **Lab ID: 40259992001** Collected: 03/27/23 10:30 Received: 03/29/23 09:45 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	-0.562 ± 0.572 (1.40) C:NA T:96%	pCi/L	04/08/23 16:42	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	-0.00854 ± 0.298 (0.699) C:81% T:87%	pCi/L	04/07/23 11:09	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.000 ± 0.870 (2.10)	pCi/L	04/17/23 16:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-314 **Lab ID: 40259992002** Collected: 03/27/23 11:20 Received: 03/29/23 09:45 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	-0.164 ± 0.507 (1.15) C:NA T:97%	pCi/L	04/08/23 16:58	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.666 ± 0.382 (0.700) C:77% T:91%	pCi/L	04/07/23 11:09	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.666 ± 0.889 (1.85)	pCi/L	04/17/23 16:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: MW-315 **Lab ID: 40259992003** Collected: 03/27/23 12:15 Received: 03/29/23 09:45 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	-0.173 ± 0.538 (1.22) C:NA T:94%	pCi/L	04/08/23 16:58	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.385 ± 0.366 (0.755) C:82% T:90%	pCi/L	04/07/23 11:11	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.385 ± 0.904 (1.98)	pCi/L	04/17/23 16:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Sample: FIELD BLANK MOD 10-11 **Lab ID:** 40259992004 Collected: 03/27/23 11:30 Received: 03/29/23 09:45 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	0.0842 ± 0.595 (1.19) C:NA T:90%	pCi/L	04/08/23 16:58	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.354 ± 0.318 (0.647) C:84% T:91%	pCi/L	04/07/23 11:11	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.438 ± 0.913 (1.84)	pCi/L	04/17/23 16:00	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch: 577952

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: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2806236

Matrix: Water

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.115 ± 0.278 (0.620) C:81% T:88%	pCi/L	04/07/23 11:07	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

QC Batch: 577951

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: 40259992001, 40259992002, 40259992003, 40259992004

METHOD BLANK: 2806235

Matrix: Water

Associated Lab Samples: 40259992001, 40259992002, 40259992003, 40259992004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.288 (0.586) C:NA T:97%	pCi/L	04/08/23 16:42	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

DEFINITIONS

Act - Activity

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

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

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

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

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

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

1q	Due to the sample matrix, DI water was added to this sample on a one to one basis and the sample was stirred before analysis.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.
PI	The precision between the sample and the duplicate sample exceeded laboratory control limits.
R1	RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: WPL_COLUMBIA ENERGY CTR CCR
Pace Project No.: 40259992

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40259992001	MW-313	EPA 3010A	441238	EPA 6010D	441303
40259992002	MW-314	EPA 3010A	441238	EPA 6010D	441303
40259992003	MW-315	EPA 3010A	441238	EPA 6010D	441303
40259992004	FIELD BLANK MOD 10-11	EPA 3010A	441238	EPA 6010D	441303
40259992001	MW-313	EPA 3010A	441244	EPA 6020B	441314
40259992002	MW-314	EPA 3010A	441244	EPA 6020B	441314
40259992003	MW-315	EPA 3010A	441244	EPA 6020B	441314
40259992004	FIELD BLANK MOD 10-11	EPA 3010A	441244	EPA 6020B	441314
40259992001	MW-313	EPA 7470	441349	EPA 7470	441416
40259992002	MW-314	EPA 7470	441349	EPA 7470	441416
40259992003	MW-315	EPA 7470	441349	EPA 7470	441416
40259992004	FIELD BLANK MOD 10-11	EPA 7470	441349	EPA 7470	441416
40259992001	MW-313				
40259992002	MW-314				
40259992003	MW-315				
40259992001	MW-313	EPA 903.1	577951		
40259992002	MW-314	EPA 903.1	577951		
40259992003	MW-315	EPA 903.1	577951		
40259992004	FIELD BLANK MOD 10-11	EPA 903.1	577951		
40259992001	MW-313	EPA 904.0	577952		
40259992002	MW-314	EPA 904.0	577952		
40259992003	MW-315	EPA 904.0	577952		
40259992004	FIELD BLANK MOD 10-11	EPA 904.0	577952		
40259992001	MW-313	Total Radium Calculation	581519		
40259992002	MW-314	Total Radium Calculation	581519		
40259992003	MW-315	Total Radium Calculation	581519		
40259992004	FIELD BLANK MOD 10-11	Total Radium Calculation	581519		
40259992001	MW-313	SM 2540C	441178		
40259992002	MW-314	SM 2540C	441178		
40259992003	MW-315	SM 2540C	441178		
40259992004	FIELD BLANK MOD 10-11	SM 2540C	441178		
40259992001	MW-313	EPA 9040	441342		
40259992002	MW-314	EPA 9040	441342		
40259992003	MW-315	EPA 9040	441342		
40259992004	FIELD BLANK MOD 10-11	EPA 9040	441342		
40259992001	MW-313	EPA 300.0	441321		
40259992002	MW-314	EPA 300.0	441977		
40259992003	MW-315	EPA 300.0	441977		
40259992004	FIELD BLANK MOD 10-11	EPA 300.0	441977		
40259992001	MW-313	EPA 310.2	441538		
40259992002	MW-314	EPA 310.2	441538		
40259992003	MW-315	EPA 310.2	441538		
40259992004	FIELD BLANK MOD 10-11	EPA 310.2	441538		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: WPL_COLUMBIA ENERGY CTR CCR

Pace Project No.: 40259992

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40259992001	MW-313	EPA 353.2	441665		
40259992002	MW-314	EPA 353.2	441665		
40259992003	MW-315	EPA 353.2	441665		
40259992004	FIELD BLANK MOD 10-11	EPA 353.2	441665		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40259992

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers Billing Information: 25222157

Address: 2830 Dairy Dr

Report To: Meghan Blodgett Email To: mblodgett@scsengineers.com

Copy To: WPL - Columbia Energy Center Site Collection Info/Address: WPL Portage

Customer Project Name/Number: State: WI County/City: Portage Time Zone Collected: [] PT [] MT [X] CT [] ET

Container Preservative Type ** U U I I I I Z Lab Project Manager:

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

Phone: 714-897-4253 Site/Facility ID #: Compliance Monitoring? [] Yes [] No

Email: eschroeder@scsengineers.com

Collected By (print): Ethan Schroeder Purchase Order #: DW PWS ID #: DW Location Code:

Collected By (signature): [Signature] Turnaround Date Required: Immediately Packed on Ice: [] Yes [] No

Sample Disposal: [] Dispose as appropriate [] Return [] Archive [] Hold Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day Field Filtered (if applicable): [] Yes [] No

(Expedite Charges Apply) Analysis:

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

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns	TDS, Chloride, Fluoride, Sulfate	pH, alkalinity	Radium 226	Radium 228	Metals, Hardness	Nitrate + Nitrite
			Date	Time	Date	Time								
MW-313	GW	6	3/27	1030				6	X	X	X	X	X	X
MW-314	GW	6	3/27	1120				6	X	X	X	X	X	X
MW-315	GW	6	3/27	1215				6	X	X	X	X	X	X
Field Blank W0110-11		6	3/27	1130				6	X	X	X	X	X	X

LAB USE ONLY: Lab Sample # / Comments:

001
002
003
004

Customer Remarks / Special Conditions / Possible Hazards: Type of Ice Used: Wet Blue Dry None

Packing Material Used: ①

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

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

Lab Tracking #: 2829932

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: _____

Cooler 1 Temp Upon Receipt: OC

Cooler 1 Therm Corr. Factor: OC

Cooler 1 Corrected Temp: OC

Comments:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s): Page 33 of 35

YES / NO of: _____

Relinquished by/Company: (Signature) [Signature] Date/Time: 3/28/23 1600 Received by/Company: (Signature) _____ Date/Time: _____

Relinquished by/Company: (Signature) [Signature] Date/Time: 3/29/23 0945 Received by/Company: (Signature) [Signature] Date/Time: 3/29/23 0945

Relinquished by/Company: (Signature) _____ Date/Time: _____ Received by/Company: (Signature) _____ Date/Time: _____

MTJL LAB USE ONLY

Table #: ①

Acctnum: _____

Template: _____

Prelogin: _____

PM: _____

BB: _____

Effective Date: 8/16/2022

Client Name: SCS Engineers

Sample Preservation Receipt Form
Project # 40259992

All containers needing preservation have been checked and noted below

Yes No N/A

Initial when completed SG

Date/Time

Lab Lot# of pH paper 106722

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

Pace Lab #	Glass						Plastic						Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH s2	NaOH+Zn Act pH s9	NaOH pH ≥12	HNO3 pH s2	pH after adjusted	Volume (mL)						
	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		
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
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

5/29/23 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 headdress 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 L Poly H2O3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: S&S Engineers

WO#: **40259992**

Courier: CS Logistics Fed Ex Speedee UPS Walto
 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-9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 0.5 / Corr: 1.5

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 3/29/23 Initials: SG

Labeled By Initials: R, A

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

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

May 26, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

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

Revised Report: REDOX has been added to the field data list for MW-84A.

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Florida: Cert E871149 SEKS WET

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261460001	MW-301	Water	04/27/23 12:20	04/28/23 08:40
40261460002	MW-84A	Water	04/27/23 14:05	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40261460001	MW-301	EPA 6020B	TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40261460002	MW-84A	EPA 6020B	TXW
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	SRK			1	PASI-G
EPA 300.0	HMB			3	PASI-G

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:01	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:01	7440-38-2	
Barium	9.8	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:01	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:01	7440-41-7	
Boron	20.1	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:01	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:01	7440-43-9	
Calcium	120000	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:01	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:01	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:01	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:01	7439-92-1	
Lithium	0.62J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:01	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:01	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:01	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:01	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:00	7439-97-6	M0
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.65	Std. Units			1		04/27/23 12:20		
Field Specific Conductance	857.0	umhos/cm			1		04/27/23 12:20		
Oxygen, Dissolved	6.50	mg/L			1		04/27/23 12:20	7782-44-7	
REDOX	95.3	mV			1		04/27/23 12:20		
Turbidity	0.00	NTU			1		04/27/23 12:20		
Static Water Level	787.57	feet			1		04/27/23 12:20		
Temperature, Water (C)	8.0	deg C			1		04/27/23 12:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	526	mg/L	20.0	8.7	1		05/01/23 10:51		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.9	Std. Units	0.10	0.010	1		05/02/23 16:48		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	1.5J	mg/L	2.0	0.43	1		05/12/23 16:00	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:00	16984-48-8	
Sulfate	12.3	mg/L	2.0	0.44	1		05/12/23 16:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-84A **Lab ID: 40261460002** Collected: 04/27/23 14:05 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 08:08	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 08:08	7440-38-2	
Barium	12.6	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 08:08	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 08:08	7440-41-7	
Boron	10.3	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 08:08	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 08:08	7440-43-9	
Calcium	68600	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 08:08	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 08:08	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 08:08	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 08:08	7439-92-1	
Lithium	0.71J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 08:08	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 08:08	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 08:08	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 08:08	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	05/08/23 10:55	05/09/23 09:12	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.01	Std. Units			1		04/27/23 14:05		
Field Specific Conductance	556.6	umhos/cm			1		04/27/23 14:05		
Field Oxidation Potential	103.4	mV			1		04/27/23 14:05		
Oxygen, Dissolved	9.37	mg/L			1		04/27/23 14:05	7782-44-7	
Turbidity	0.72	NTU			1		04/27/23 14:05		
Static Water Level	786.97	feet			1		04/27/23 14:05		
Temperature, Water (C)	10.7	deg C			1		04/27/23 14:05		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	326	mg/L	20.0	8.7	1		05/01/23 10:51		
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		05/02/23 16:52		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	3.0	mg/L	2.0	0.43	1		05/12/23 16:59	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:59	16984-48-8	
Sulfate	1.3J	mg/L	2.0	0.44	1		05/12/23 16:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 444256

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2550653

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/09/23 08:56	

LABORATORY CONTROL SAMPLE: 2550654

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550655 2550656

Parameter	Units	40261460001		2550655		2550656		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Mercury	ug/L	<0.066	5	5	5.8	5.9	115	119	85-115	3	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

QC Batch: 443628 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547530 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/11/23 17:42	
Arsenic	ug/L	<0.28	1.0	05/11/23 17:42	
Barium	ug/L	<0.70	2.3	05/11/23 17:42	
Beryllium	ug/L	<0.25	1.0	05/11/23 17:42	
Boron	ug/L	<3.0	10.0	05/11/23 17:42	
Cadmium	ug/L	<0.15	1.0	05/11/23 17:42	
Calcium	ug/L	<76.2	254	05/11/23 17:42	
Chromium	ug/L	<1.0	3.4	05/11/23 17:42	
Cobalt	ug/L	<0.12	1.0	05/11/23 17:42	
Lead	ug/L	<0.24	1.0	05/11/23 17:42	
Lithium	ug/L	<0.22	1.0	05/11/23 17:42	
Molybdenum	ug/L	<0.44	1.5	05/11/23 17:42	
Selenium	ug/L	<0.32	1.1	05/11/23 17:42	
Thallium	ug/L	<0.14	1.0	05/11/23 17:42	

LABORATORY CONTROL SAMPLE: 2547531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	250	100	80-120	
Arsenic	ug/L	250	255	102	80-120	
Barium	ug/L	250	234	94	80-120	
Beryllium	ug/L	250	233	93	80-120	
Boron	ug/L	250	220	88	80-120	
Cadmium	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	241	96	80-120	
Cobalt	ug/L	250	241	96	80-120	
Lead	ug/L	250	241	96	80-120	
Lithium	ug/L	250	237	95	80-120	
Molybdenum	ug/L	250	245	98	80-120	
Selenium	ug/L	250	257	103	80-120	
Thallium	ug/L	250	227	91	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Parameter	Units	2547532		2547533		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Antimony	ug/L	0.52J	250	250	268	263	107	105	75-125	2	20
Arsenic	ug/L	12.4	250	250	264	262	100	100	75-125	1	20
Barium	ug/L	128	250	250	405	384	111	102	75-125	5	20
Beryllium	ug/L	0.83J	250	250	261	259	104	103	75-125	1	20
Boron	ug/L	43.8	250	250	309	302	106	103	75-125	2	20
Cadmium	ug/L	0.56J	250	250	249	243	99	97	75-125	3	20
Calcium	ug/L	147000	10000	10000	163000	156000	157	94	75-125	4	20 P6
Chromium	ug/L	30.1	250	250	279	274	100	98	75-125	2	20
Cobalt	ug/L	19.2	250	250	257	254	95	94	75-125	1	20
Lead	ug/L	26.6	250	250	280	274	102	99	75-125	2	20
Lithium	ug/L	23.9	250	250	277	276	101	101	75-125	0	20
Molybdenum	ug/L	1.3J	250	250	246	241	98	96	75-125	2	20
Selenium	ug/L	1.9J	250	250	267	264	106	105	75-125	1	20
Thallium	ug/L	0.44J	250	250	250	251	100	100	75-125	0	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443675

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

METHOD BLANK: 2547666

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261460001, 40261460002

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

QC Batch: 444310 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: 40261460001, 40261460002

METHOD BLANK: 2550800 Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/12/23 14:40	
Fluoride	mg/L	<0.095	0.32	05/12/23 14:40	
Sulfate	mg/L	<0.44	2.0	05/12/23 14:40	

LABORATORY CONTROL SAMPLE: 2550801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550802 2550803

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261459001 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	2.3	20	20	22.6	22.7	102	102	90-110	0	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	105	104	90-110	0	15		
Sulfate	mg/L	11.0	20	20	31.5	31.5	103	103	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-301 **Lab ID: 40261460001** Collected: 04/27/23 12:20 Received: 04/28/23 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.387 (0.805) C:NA T:99%	pCi/L	05/18/23 14:53	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.417 ± 0.322 (0.623) C:80% T:87%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.417 ± 0.709 (1.43)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

Sample: MW-84A **Lab ID: 40261460002** Collected: 04/27/23 14:05 Received: 04/28/23 08:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.000 ± 0.365 (0.772) C:NA T:95%	pCi/L	05/18/23 15:08	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.326 ± 0.316 (0.647) C:79% T:93%	pCi/L	05/15/23 15:22	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.326 ± 0.681 (1.42)	pCi/L	05/22/23 12:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585758

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: 40261460001, 40261460002

METHOD BLANK: 2845167

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.356 ± 0.319 (0.642) C:76% T:89%	pCi/L	05/15/23 15:19	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

QC Batch: 585757

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: 40261460001, 40261460002

METHOD BLANK: 2845166

Matrix: Water

Associated Lab Samples: 40261460001, 40261460002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0428 ± 0.195 (0.397) C:NA T:94%	pCi/L	05/18/23 14:53	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 COLUMBIA CCR BCKGRND

Pace Project No.: 40261460

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

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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA CCR BCKGRND
Pace Project No.: 40261460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261460001	MW-301	EPA 3010A	443628	EPA 6020B	443733
40261460002	MW-84A	EPA 3010A	443628	EPA 6020B	443733
40261460001	MW-301	EPA 7470	444256	EPA 7470	444285
40261460002	MW-84A	EPA 7470	444256	EPA 7470	444285
40261460001	MW-301				
40261460002	MW-84A				
40261460001	MW-301	EPA 903.1	585757		
40261460002	MW-84A	EPA 903.1	585757		
40261460001	MW-301	EPA 904.0	585758		
40261460002	MW-84A	EPA 904.0	585758		
40261460001	MW-301	Total Radium Calculation	589747		
40261460002	MW-84A	Total Radium Calculation	589747		
40261460001	MW-301	SM 2540C	443675		
40261460002	MW-84A	SM 2540C	443675		
40261460001	MW-301	EPA 9040	443847		
40261460002	MW-84A	EPA 9040	443847		
40261460001	MW-301	EPA 300.0	444310		
40261460002	MW-84A	EPA 300.0	444310		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Pace

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

Section A Required Client Information: Company: SCS ENGINEERS Address: 2830 Dairy Drive Madison, WI 53718 Phone: 608-216-7382 Fax: Requested Due Date: Madison, WI 53718 Email: mhodgyn@scsengineers.com

Section B Required Project Information: Report To: Meghan Blockett Copy To: Project Name: 25223067 Columbia CCR Background Project #: 25223067

Section C Invoicing Information: Attention: Company Name: Address: Pace Quote Pace Project Manager: dan.milewsky@pacelabs.com Pace Profile #:

ITEM #	MATRIX	CODE	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test	Residual Chlorine (Y/N)			
			START DATE	END DATE			npreserved	2SO4	F NO3	HCl	NaOH	Na2S2O3			Methanol	Other	Y/N
			TIME	TIME													

1	MM-301	WT	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives						Analyses Test	Residual Chlorine (Y/N)			
			START DATE	END DATE			npreserved	2SO4	F NO3	HCl	NaOH	Na2S2O3			Methanol	Other	Y/N
			TIME	TIME													
1	MM-301	WT	4/27/2020			X	X	X	X	X	X	X	X	X			
2	MM-84A	WT	4/27	NO5		X	X	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	SAMPLE CONDITIONS			
							Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)	Temp in C
	Budget Russell	4/27	1600	See Signature	4/27/2020	20	Y	Y	Y	

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER: Budget Russell	DATE Signed: 4/27/2020
SIGNATURE OF SAMPLER: <i>Budget Russell</i>	

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # 40261460

All containers needing preservation have been checked and noted below.

Yes No N/A

Initial when completed: SG Date/Time: _____

Lab Lot# of pH paper: 1000777 Lab Std #ID of preservation (if pH adjusted): _____

Pace Lab #	Glass					Plastic					Vials					Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)				
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JG1U	JG9U	WG1U	WPFU								SP5T	ZPLC	GN 1	GN 2
001																																		
002																																		
003																																		
004																																		
005																																		
006																																		
007																																		
008																																		
009																																		
010																																		
011																																		
012																																		
013																																		
014																																		
015																																		
016																																		
017																																		
018																																		
019																																		
020																																		

4/28/23 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	JG1U	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	WG1U	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	<u>1L poly HNO3</u>
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SLS Engineers

WO#: **40261460**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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 - 9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 2.0

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

Person examining contents:
 Date: 4/28/23 Initials: SG
 Labeled By Initials: mt

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

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time:
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> , Pace IR, Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>002 same "1045"</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>		<u>4/28/23 SG</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: check used white out on bottle types 4/28/23 SG

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

May 23, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 28, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - 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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150

South Carolina Certification #: 83006001
Texas Certification #: T104704529-21-8
Virginia VELAP Certification ID: 11873
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-21-00008
Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261459001	MW-313	Water	04/26/23 14:05	04/28/23 08:40
40261459002	MW-314	Water	04/26/23 13:30	04/28/23 08:40
40261459003	MW-315	Water	04/26/23 14:25	04/28/23 08:40
40261459004	FIELD BLANK-MOD 10-11	Water	04/26/23 14:00	04/28/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40261459001	MW-313	EPA 6020B	TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40261459002	MW-314	EPA 6020B	TXW
EPA 7470	AJT			1	PASI-G
	LB			7	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	ZPC			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	YER			1	PASI-G
EPA 300.0	HMB			3	PASI-G
40261459003	MW-315			EPA 6020B	TXW
		EPA 7470	AJT	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	HNT	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40261459004	FIELD BLANK-MOD 10-11	EPA 6020B	TXW
EPA 7470	AJT			1	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	ZPC			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	HNT			1	PASI-G
EPA 9040	SRK			1	PASI-G
EPA 300.0	HMB			3	PASI-G

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Sample: MW-313 **Lab ID: 40261459001** Collected: 04/26/23 14:05 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 07:39	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 07:39	7440-38-2	
Barium	44.3	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 07:39	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 07:39	7440-41-7	
Boron	108	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 07:39	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 07:39	7440-43-9	
Calcium	63900	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 07:39	7440-70-2	
Chromium	1.2J	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 07:39	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 07:39	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 07:39	7439-92-1	
Lithium	0.67J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 07:39	7439-93-2	
Molybdenum	1.3J	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 07:39	7439-98-7	
Selenium	0.58J	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 07:39	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 07:39	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	05/01/23 10:55	05/02/23 07:51	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.06	Std. Units			1		04/26/23 14:05		
Field Specific Conductance	552.6	umhos/cm			1		04/26/23 14:05		
Oxygen, Dissolved	7.96	mg/L			1		04/26/23 14:05	7782-44-7	
REDOX	103.2	mV			1		04/26/23 14:05		
Turbidity	1.02	NTU			1		04/26/23 14:05		
Static Water Level	785.21	feet			1		04/26/23 14:05		
Temperature, Water (C)	10.1	deg C			1		04/26/23 14:05		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	318	mg/L	20.0	8.7	1		05/01/23 10:49		
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		05/02/23 12:04		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	2.3	mg/L	2.0	0.43	1		05/12/23 15:16	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 15:16	16984-48-8	
Sulfate	11.0	mg/L	2.0	0.44	1		05/12/23 15:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Sample: MW-314 **Lab ID: 40261459002** Collected: 04/26/23 13:30 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 07:46	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 07:46	7440-38-2	
Barium	42.7	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 07:46	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 07:46	7440-41-7	
Boron	15.5	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 07:46	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 07:46	7440-43-9	
Calcium	92400	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 07:46	7440-70-2	
Chromium	1.1J	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 07:46	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 07:46	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 07:46	7439-92-1	
Lithium	0.40J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 07:46	7439-93-2	
Molybdenum	1.5	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 07:46	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 07:46	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 07:46	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	05/01/23 10:55	05/02/23 07:53	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.21	Std. Units			1		04/26/23 13:30		
Field Specific Conductance	735	umhos/cm			1		04/26/23 13:30		
Oxygen, Dissolved	6.15	mg/L			1		04/26/23 13:30	7782-44-7	
REDOX	121.6	mV			1		04/26/23 13:30		
Turbidity	1.80	NTU			1		04/26/23 13:30		
Static Water Level	785.43	feet			1		04/26/23 13:30		
Temperature, Water (C)	10.0	deg C			1		04/26/23 13:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	418	mg/L	20.0	8.7	1		05/01/23 10:50		
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		05/02/23 12:13		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	3.2	mg/L	2.0	0.43	1		05/12/23 16:14	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:14	16984-48-8	
Sulfate	4.6	mg/L	2.0	0.44	1		05/12/23 16:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Sample: MW-315 **Lab ID: 40261459003** Collected: 04/26/23 14:25 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 07:54	7440-36-0	
Arsenic	0.39J	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 07:54	7440-38-2	
Barium	31.7	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 07:54	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 07:54	7440-41-7	
Boron	12.0	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 07:54	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 07:54	7440-43-9	
Calcium	101000	ug/L	254	76.2	1	05/01/23 06:24	05/13/23 03:35	7440-70-2	
Chromium	1.9J	ug/L	3.4	1.0	1	05/01/23 06:24	05/13/23 03:35	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/13/23 03:35	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 07:54	7439-92-1	
Lithium	0.80J	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 07:54	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 07:54	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 07:54	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 07:54	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	05/01/23 10:55	05/02/23 07:56	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.18	Std. Units			1		04/26/23 14:25		
Field Specific Conductance	776	umhos/cm			1		04/26/23 14:25		
Oxygen, Dissolved	8.46	mg/L			1		04/26/23 14:25	7782-44-7	
REDOX	123.4	mV			1		04/26/23 14:25		
Turbidity	2.66	NTU			1		04/26/23 14:25		
Static Water Level	785.59	feet			1		04/26/23 14:25		
Temperature, Water (C)	10.3	deg C			1		04/26/23 14:25		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	452	mg/L	20.0	8.7	1		05/01/23 10:50		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		05/02/23 16:34		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	5.3	mg/L	2.0	0.43	1		05/12/23 16:29	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:29	16984-48-8	
Sulfate	10.1	mg/L	2.0	0.44	1		05/12/23 16:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067COLUMBIA CCR MODS10-11
Pace Project No.: 40261459

Sample: FIELD BLANK-MOD 10-11 Lab ID: 40261459004 Collected: 04/26/23 14:00 Received: 04/28/23 08:40 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	05/01/23 06:24	05/15/23 06:27	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	05/01/23 06:24	05/15/23 06:27	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	05/01/23 06:24	05/15/23 06:27	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	05/01/23 06:24	05/15/23 06:27	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	05/01/23 06:24	05/15/23 06:27	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	05/01/23 06:24	05/15/23 06:27	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	05/01/23 06:24	05/15/23 06:27	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	05/01/23 06:24	05/15/23 06:27	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	05/01/23 06:24	05/15/23 06:27	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	05/01/23 06:24	05/15/23 06:27	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	05/01/23 06:24	05/15/23 06:27	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	05/01/23 06:24	05/15/23 06:27	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	05/01/23 06:24	05/15/23 06:27	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	05/01/23 06:24	05/15/23 06:27	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Green Bay									
Mercury	0.080J	ug/L	0.20	0.066	1	05/01/23 10:55	05/02/23 07:58	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		05/01/23 10:50		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.3	Std. Units	0.10	0.010	1		05/02/23 16:45		H6
300.0 IC Anions									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		05/12/23 16:44	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		05/12/23 16:44	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		05/12/23 16:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 443687	Analysis Method: EPA 7470
QC Batch Method: EPA 7470	Analysis Description: 7470 Mercury
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2547707 Matrix: Water
Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	05/02/23 06:58	

LABORATORY CONTROL SAMPLE: 2547708

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547709 2547710

Parameter	Units	40261076001		2547709		2547710		% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Mercury	ug/L	<0.066	5	5	5.1	5.1	101	101	85-115	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 443628	Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A	Analysis Description: 6020B MET
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2547530 Matrix: Water

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	05/11/23 17:42	
Arsenic	ug/L	<0.28	1.0	05/11/23 17:42	
Barium	ug/L	<0.70	2.3	05/11/23 17:42	
Beryllium	ug/L	<0.25	1.0	05/11/23 17:42	
Boron	ug/L	<3.0	10.0	05/11/23 17:42	
Cadmium	ug/L	<0.15	1.0	05/11/23 17:42	
Calcium	ug/L	<76.2	254	05/11/23 17:42	
Chromium	ug/L	<1.0	3.4	05/11/23 17:42	
Cobalt	ug/L	<0.12	1.0	05/11/23 17:42	
Lead	ug/L	<0.24	1.0	05/11/23 17:42	
Lithium	ug/L	<0.22	1.0	05/11/23 17:42	
Molybdenum	ug/L	<0.44	1.5	05/11/23 17:42	
Selenium	ug/L	<0.32	1.1	05/11/23 17:42	
Thallium	ug/L	<0.14	1.0	05/11/23 17:42	

LABORATORY CONTROL SAMPLE: 2547531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	250	100	80-120	
Arsenic	ug/L	250	255	102	80-120	
Barium	ug/L	250	234	94	80-120	
Beryllium	ug/L	250	233	93	80-120	
Boron	ug/L	250	220	88	80-120	
Cadmium	ug/L	250	254	102	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Chromium	ug/L	250	241	96	80-120	
Cobalt	ug/L	250	241	96	80-120	
Lead	ug/L	250	241	96	80-120	
Lithium	ug/L	250	237	95	80-120	
Molybdenum	ug/L	250	245	98	80-120	
Selenium	ug/L	250	257	103	80-120	
Thallium	ug/L	250	227	91	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Parameter	Units	2547532		2547533		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Antimony	ug/L	0.52J	250	250	268	263	107	105	75-125	2	20
Arsenic	ug/L	12.4	250	250	264	262	100	100	75-125	1	20
Barium	ug/L	128	250	250	405	384	111	102	75-125	5	20
Beryllium	ug/L	0.83J	250	250	261	259	104	103	75-125	1	20
Boron	ug/L	43.8	250	250	309	302	106	103	75-125	2	20
Cadmium	ug/L	0.56J	250	250	249	243	99	97	75-125	3	20
Calcium	ug/L	147000	10000	10000	163000	156000	157	94	75-125	4	20 P6
Chromium	ug/L	30.1	250	250	279	274	100	98	75-125	2	20
Cobalt	ug/L	19.2	250	250	257	254	95	94	75-125	1	20
Lead	ug/L	26.6	250	250	280	274	102	99	75-125	2	20
Lithium	ug/L	23.9	250	250	277	276	101	101	75-125	0	20
Molybdenum	ug/L	1.3J	250	250	246	241	98	96	75-125	2	20
Selenium	ug/L	1.9J	250	250	267	264	106	105	75-125	1	20
Thallium	ug/L	0.44J	250	250	250	251	100	100	75-125	0	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch:	443675	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2547666 Matrix: Water
Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	05/01/23 10:47	

LABORATORY CONTROL SAMPLE: 2547667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	552	95	80-120	

SAMPLE DUPLICATE: 2547668

Parameter	Units	40261457001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	448	464	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 443778

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261459001, 40261459002

SAMPLE DUPLICATE: 2547973

Parameter	Units	40261401001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	8.0	1	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 443847

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40261459003, 40261459004

SAMPLE DUPLICATE: 2548305

Parameter	Units	40261459003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch:	444310	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: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2550800 Matrix: Water
Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/12/23 14:40	
Fluoride	mg/L	<0.095	0.32	05/12/23 14:40	
Sulfate	mg/L	<0.44	2.0	05/12/23 14:40	

LABORATORY CONTROL SAMPLE: 2550801

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.5	98	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	19.7	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550802 2550803

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40261459001 Result	Spike Conc.	Spike Conc.	Conc.								
Chloride	mg/L	2.3	20	20	22.6	22.7	102	102	90-110	0	15		
Fluoride	mg/L	<0.095	2	2	2.1	2.1	105	104	90-110	0	15		
Sulfate	mg/L	11.0	20	20	31.5	31.5	103	103	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Sample: MW-313 **Lab ID: 40261459001** Collected: 04/26/23 14:05 Received: 04/28/23 08:40 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	0.294 ± 0.477 (0.829) C:NA T:97%	pCi/L	05/19/23 14:12	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.383 ± 0.290 (0.560) C:85% T:92%	pCi/L	05/12/23 15:54	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.677 ± 0.767 (1.39)	pCi/L	05/22/23 12:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Sample: MW-314 **Lab ID: 40261459002** Collected: 04/26/23 13:30 Received: 04/28/23 08:40 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	-0.186 ± 0.366 (0.876) C:NA T:93%	pCi/L	05/19/23 14:24	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	-0.0181 ± 0.290 (0.691) C:72% T:91%	pCi/L	05/12/23 15:54	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.000 ± 0.656 (1.57)	pCi/L	05/22/23 12:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Sample: MW-315 **Lab ID: 40261459003** Collected: 04/26/23 14:25 Received: 04/28/23 08:40 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	-0.174 ± 0.301 (0.760) C:NA T:90%	pCi/L	05/19/23 14:24	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.257 ± 0.328 (0.697) C:80% T:92%	pCi/L	05/12/23 15:54	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.257 ± 0.629 (1.46)	pCi/L	05/22/23 12:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Sample: FIELD BLANK-MOD 10-11 **Lab ID:** 40261459004 Collected: 04/26/23 14:00 Received: 04/28/23 08:40 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	0.179 ± 0.454 (0.843) C:NA T:92%	pCi/L	05/19/23 14:24	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	-0.346 ± 0.312 (0.799) C:75% T:90%	pCi/L	05/12/23 15:54	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.179 ± 0.766 (1.64)	pCi/L	05/22/23 12:37	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 585857

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: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2845633

Matrix: Water

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0964 ± 0.220 (0.131) C:NA T:86%	pCi/L	05/19/23 14:12	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

QC Batch: 585859

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: 40261459001, 40261459002, 40261459003, 40261459004

METHOD BLANK: 2845642

Matrix: Water

Associated Lab Samples: 40261459001, 40261459002, 40261459003, 40261459004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.159 ± 0.298 (0.655) C:87% T:85%	pCi/L	05/12/23 15:53	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

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

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067COLUMBIA CCR MODS10-11

Pace Project No.: 40261459

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261459001	MW-313	EPA 3010A	443628	EPA 6020B	443733
40261459002	MW-314	EPA 3010A	443628	EPA 6020B	443733
40261459003	MW-315	EPA 3010A	443628	EPA 6020B	443733
40261459004	FIELD BLANK-MOD 10-11	EPA 3010A	443628	EPA 6020B	443733
40261459001	MW-313	EPA 7470	443687	EPA 7470	443719
40261459002	MW-314	EPA 7470	443687	EPA 7470	443719
40261459003	MW-315	EPA 7470	443687	EPA 7470	443719
40261459004	FIELD BLANK-MOD 10-11	EPA 7470	443687	EPA 7470	443719
40261459001	MW-313				
40261459002	MW-314				
40261459003	MW-315				
40261459001	MW-313	EPA 903.1	585857		
40261459002	MW-314	EPA 903.1	585857		
40261459003	MW-315	EPA 903.1	585857		
40261459004	FIELD BLANK-MOD 10-11	EPA 903.1	585857		
40261459001	MW-313	EPA 904.0	585859		
40261459002	MW-314	EPA 904.0	585859		
40261459003	MW-315	EPA 904.0	585859		
40261459004	FIELD BLANK-MOD 10-11	EPA 904.0	585859		
40261459001	MW-313	Total Radium Calculation	589741		
40261459002	MW-314	Total Radium Calculation	589741		
40261459003	MW-315	Total Radium Calculation	589741		
40261459004	FIELD BLANK-MOD 10-11	Total Radium Calculation	589741		
40261459001	MW-313	SM 2540C	443675		
40261459002	MW-314	SM 2540C	443675		
40261459003	MW-315	SM 2540C	443675		
40261459004	FIELD BLANK-MOD 10-11	SM 2540C	443675		
40261459001	MW-313	EPA 9040	443778		
40261459002	MW-314	EPA 9040	443778		
40261459003	MW-315	EPA 9040	443847		
40261459004	FIELD BLANK-MOD 10-11	EPA 9040	443847		
40261459001	MW-313	EPA 300.0	444310		
40261459002	MW-314	EPA 300.0	444310		
40261459003	MW-315	EPA 300.0	444310		
40261459004	FIELD BLANK-MOD 10-11	EPA 300.0	444310		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY / Analytical Request Document

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

40261459

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:

Page: 1 Of 1

Header information table with fields for Company (SCS ENGINEERS), Report To (Meghan Blodgett), Attention, Address (2830 Dairy Drive), Copy To, Company Name, Madison, WI 53718, Email (mblodgett@scsengineers.com), Purchase Order #, Fax (608-216-7362), Project Name (25223067 Columbia CCR Mods 10-11), Requested Due Date, Project # (25223067), and Pace Profile #.

Regulatory Agency and State / Location table, with WI listed in the State / Location field.

Main table with columns: ITEM #, SAMPLE ID (One Character per box), MATRIX (Drinking Water, Waste Water, Product, Sol/Solid, Oil, Wipe, Air, Other, Tissue), CODE (DW, WT, P, SL, OL, WP, AR, QT, TS), MATRIX CODE, SAMPLE TYPE, COLLECTED (START, END), SAMPLE TEMP AT COLLECTION, # OF CONTAINERS, Preservatives (H2SO4, HNO3, HCl, NaOH, Na2S2O3, Methanol, Other), Y/N, Analytes Test (Radium 226, Radium 228, Metals, TDS and pH, Chloride, Fluoride, Sulfate), Requested Analysis Filtered (Y/N), Residual Chlorine (Y/N).

Table with 4 columns: ADDITIONAL COMMENTS, RELINQUISHED BY / AFFILIATION, DATE, TIME, ACCEPTED BY / AFFILIATION, DATE, TIME, SAMPLE CONDITIONS. Includes handwritten entries for Bridge Russell and CS Logistics.

Table with fields: SAMPLER NAME AND SIGNATURE, PRINT Name of SAMPLER (Bridge Russell), SIGNATURE of SAMPLER (Bridge Russell), DATE Signed (4/27/2023), TEMP in C, Received on (ice), Custody (Sealed, Cooler), Samples intact (Y/N).

Client Name: SLS Engineers

Sample Preservation Receipt Form

Project # 4026459

All containers needing preservation have been checked and noted below.

Yes No N/A

Lab Lot# of pH paper: W000722

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

Initial when completed: SG Date/Time:

Pace Lab #	Glass						Plastic						Vials					Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)			
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JG9U	JG9U	WG9U	WPFU	SP5T	ZPLC								GN 1	GN 2	
001																																			
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	


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	JG9U	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	WG9U	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9H	40 mL clear vial HCL	WPFU	4 oz plastic jar unpres
AG5U	100 mL amber glass unpres	BP3S	250 mL plastic H2SO4	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH + Zn	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres					GN 1	1L poly HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Client Name: SLS Engineers
 Courier: CS Logistics Fed Ex Speedee UPS Walco
 Client Pace Other: _____

Project #: _____
WO#: 40261459

 40261459

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-9 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 1.0 / Corr: 2.0
 Temp Blank Present: yes no Biological Tissue is Frozen: yes no

Person examining contents:
 Date: 4/28/23 Initials: SB
 Labeled By Initials: mtt

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

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- DI VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> ; Pace IR, Non-Pace		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>W3</u>		
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____

June 23, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

Dear Meghan Blodgett:

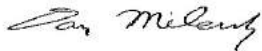
Enclosed are the analytical results for sample(s) received by the laboratory on June 01, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

CERTIFICATIONS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Pace Analytical Services Pennsylvania

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

South Carolina Certification #: 83006001

Texas Certification #: T104704529-21-8

Virginia VELAP Certification ID: 11873

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-21-00008

Federal Fish & Wildlife Permit #: 51774A

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE SUMMARY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40262930001	MW-313	Water	05/30/23 09:45	06/01/23 10:05
40262930002	MW-314	Water	05/30/23 10:45	06/01/23 10:05
40262930003	MW-315	Water	05/30/23 11:40	06/01/23 10:05
40262930004	FIELD BLANK MOD10-11	Water	05/30/23 12:10	06/01/23 10:05

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40262930001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AG1	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	EXM	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	DAW	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	MT	1	PASI-G
		40262930002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS, TXW			14	PASI-G
EPA 7470	AJT			1	PASI-G
	AG1			7	PASI-G
EPA 903.1	JLJ			1	PASI-PA
EPA 904.0	JJS1			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	EXM			1	PASI-G
EPA 9040	YER			1	PASI-G
EPA 300.0	DAW			3	PASI-G
EPA 310.2	DAW			1	PASI-G
EPA 353.2	MT			1	PASI-G
40262930003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS, TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AG1	7	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	EXM	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	DAW	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	MT	1	PASI-G
		40262930004	FIELD BLANK MOD10-11	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

SAMPLE ANALYTE COUNT

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS, TXW	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	JLJ	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	EXM	1	PASI-G
		EPA 9040	YER	1	PASI-G
		EPA 300.0	DAW	3	PASI-G
		EPA 310.2	DAW	1	PASI-G
		EPA 353.2	MT	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-313 Lab ID: 40262930001 Collected: 05/30/23 09:45 Received: 06/01/23 10:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	06/02/23 06:08	06/05/23 17:20	7440-50-8	
Manganese	77.9	ug/L	5.0	1.5	1	06/02/23 06:08	06/05/23 17:20	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	06/02/23 06:08	06/05/23 17:20	7440-22-4	
Total Hardness by 2340B	365	mg/L	5.4	1.0	1	06/02/23 06:08	06/05/23 17:20		
Zinc	<11.6	ug/L	40.0	11.6	1	06/02/23 06:08	06/05/23 17:20	7440-66-6	
6020B MET ICPMS									
Analytical Method: EPA 6020B Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Lithium	0.68J	ug/L	1.0	0.22	1	06/06/23 06:22	06/10/23 15:42	7439-93-2	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/06/23 06:22	06/10/23 15:42	7440-41-7	
Boron	191	ug/L	10.0	3.0	1	06/06/23 06:22	06/10/23 15:42	7440-42-8	
Calcium	69100	ug/L	254	76.2	1	06/06/23 06:22	06/10/23 15:42	7440-70-2	
Chromium	1.2J	ug/L	3.4	1.0	1	06/06/23 06:22	06/10/23 15:42	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/06/23 06:22	06/10/23 15:42	7440-48-4	
Arsenic	<0.28	ug/L	1.0	0.28	1	06/06/23 06:22	06/10/23 15:42	7440-38-2	
Selenium	0.59J	ug/L	1.1	0.32	1	06/06/23 06:22	06/10/23 15:42	7782-49-2	
Molybdenum	1.5	ug/L	1.5	0.44	1	06/06/23 06:22	06/10/23 15:42	7439-98-7	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/06/23 06:22	06/10/23 15:42	7440-43-9	
Antimony	<0.15	ug/L	1.0	0.15	1	06/06/23 06:22	06/10/23 15:42	7440-36-0	
Barium	47.8	ug/L	2.3	0.70	1	06/06/23 06:22	06/10/23 15:42	7440-39-3	
Thallium	0.21J	ug/L	1.0	0.14	1	06/06/23 06:22	06/10/23 15:42	7440-28-0	
Lead	<0.24	ug/L	1.0	0.24	1	06/06/23 06:22	06/10/23 15:42	7439-92-1	
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	06/05/23 10:10	06/06/23 07:42	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.55	Std. Units			1		05/30/23 09:45		
Field Specific Conductance	520.9	umhos/cm			1		05/30/23 09:45		
Oxygen, Dissolved	7.38	mg/L			1		05/30/23 09:45	7782-44-7	
REDOX	177.0	mV			1		05/30/23 09:45		
Turbidity	2.52	NTU			1		05/30/23 09:45		
Static Water Level	785.24	feet			1		05/30/23 09:45		
Temperature, Water (C)	10.4	deg C			1		05/30/23 09:45		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	334	mg/L	20.0	8.7	1		06/05/23 07:49		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		06/06/23 09:13		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-313 **Lab ID: 40262930001** Collected: 05/30/23 09:45 Received: 06/01/23 10:05 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	10.0	mg/L	2.0	0.43	1		06/16/23 15:59	16887-00-6	
Fluoride	0.61	mg/L	0.32	0.095	1		06/19/23 11:54	16984-48-8	
Sulfate	16.5	mg/L	2.0	0.44	1		06/16/23 15:59	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	302	mg/L	50.0	14.9	2		06/05/23 10:37		
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	5.2	mg/L	0.25	0.059	1		06/06/23 13:54		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

Sample: MW-314 **Lab ID: 40262930002** Collected: 05/30/23 10:45 Received: 06/01/23 10:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	06/02/23 06:08	06/05/23 17:22	7440-50-8	
Manganese	11.7	ug/L	5.0	1.5	1	06/02/23 06:08	06/05/23 17:22	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	06/02/23 06:08	06/05/23 17:22	7440-22-4	
Total Hardness by 2340B	502	mg/L	5.4	1.0	1	06/02/23 06:08	06/05/23 17:22		
Zinc	<11.6	ug/L	40.0	11.6	1	06/02/23 06:08	06/05/23 17:22	7440-66-6	
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	06/06/23 06:22	06/10/23 16:17	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	06/06/23 06:22	06/10/23 16:17	7440-38-2	
Barium	46.0	ug/L	2.3	0.70	1	06/06/23 06:22	06/10/23 16:17	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/06/23 06:22	06/15/23 18:46	7440-41-7	
Boron	16.9	ug/L	10.0	3.0	1	06/06/23 06:22	06/15/23 18:46	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/06/23 06:22	06/10/23 16:17	7440-43-9	
Calcium	102000	ug/L	254	76.2	1	06/06/23 06:22	06/10/23 16:17	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/06/23 06:22	06/10/23 16:17	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/06/23 06:22	06/10/23 16:17	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/06/23 06:22	06/10/23 16:17	7439-92-1	
Lithium	0.34J	ug/L	1.0	0.22	1	06/06/23 06:22	06/15/23 18:46	7439-93-2	
Molybdenum	1.7	ug/L	1.5	0.44	1	06/06/23 06:22	06/10/23 16:17	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/06/23 06:22	06/10/23 16:17	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/06/23 06:22	06/10/23 16:17	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	06/05/23 10:10	06/06/23 07:49	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.34	Std. Units			1		05/30/23 10:45		
Field Specific Conductance	674.5	umhos/cm			1		05/30/23 10:45		
Oxygen, Dissolved	6.46	mg/L			1		05/30/23 10:45	7782-44-7	
REDOX	167.5	mV			1		05/30/23 10:45		
Turbidity	1.21	NTU			1		05/30/23 10:45		
Static Water Level	785.55	feet			1		05/30/23 10:45		
Temperature, Water (C)	10.4	deg C			1		05/30/23 10:45		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	444	mg/L	20.0	8.7	1		06/05/23 07:49		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		06/06/23 09:15		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-314 **Lab ID: 40262930002** Collected: 05/30/23 10:45 Received: 06/01/23 10:05 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	2.3	mg/L	2.0	0.43	1		06/16/23 16:14	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/23 16:14	16984-48-8	
Sulfate	3.4	mg/L	2.0	0.44	1		06/16/23 16:14	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	470	mg/L	25.0	7.4	1		06/05/23 10:40		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.27	mg/L	0.25	0.059	1		06/06/23 13:55		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 06/23/2023 01:00 PM

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

Sample: MW-315 **Lab ID: 40262930003** Collected: 05/30/23 11:40 Received: 06/01/23 10:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	06/02/23 06:08	06/05/23 17:24	7440-50-8	
Manganese	85.9	ug/L	5.0	1.5	1	06/02/23 06:08	06/05/23 17:24	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	06/02/23 06:08	06/05/23 17:24	7440-22-4	
Total Hardness by 2340B	531	mg/L	5.4	1.0	1	06/02/23 06:08	06/05/23 17:24		
Zinc	<11.6	ug/L	40.0	11.6	1	06/02/23 06:08	06/05/23 17:24	7440-66-6	
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	06/06/23 06:22	06/10/23 16:27	7440-36-0	
Arsenic	0.37J	ug/L	1.0	0.28	1	06/06/23 06:22	06/10/23 16:27	7440-38-2	
Barium	47.7	ug/L	2.3	0.70	1	06/06/23 06:22	06/10/23 16:27	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/06/23 06:22	06/15/23 19:01	7440-41-7	
Boron	13.6	ug/L	10.0	3.0	1	06/06/23 06:22	06/15/23 19:01	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/06/23 06:22	06/10/23 16:27	7440-43-9	
Calcium	108000	ug/L	254	76.2	1	06/06/23 06:22	06/10/23 16:27	7440-70-2	
Chromium	1.7J	ug/L	3.4	1.0	1	06/06/23 06:22	06/10/23 16:27	7440-47-3	
Cobalt	0.22J	ug/L	1.0	0.12	1	06/06/23 06:22	06/10/23 16:27	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/06/23 06:22	06/10/23 16:27	7439-92-1	
Lithium	0.45J	ug/L	1.0	0.22	1	06/06/23 06:22	06/15/23 19:01	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	06/06/23 06:22	06/10/23 16:27	7439-98-7	
Selenium	0.36J	ug/L	1.1	0.32	1	06/06/23 06:22	06/10/23 16:27	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/06/23 06:22	06/10/23 16:27	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	06/05/23 10:10	06/06/23 07:51	7439-97-6	
Field Data									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.34	Std. Units			1		05/30/23 11:40		
Field Specific Conductance	716	umhos/cm			1		05/30/23 11:40		
Oxygen, Dissolved	7.02	mg/L			1		05/30/23 11:40	7782-44-7	
REDOX	116.0	mV			1		05/30/23 11:40		
Turbidity	2.83	NTU			1		05/30/23 11:40		
Static Water Level	785.77	feet			1		05/30/23 11:40		
Temperature, Water (C)	10.8	deg C			1		05/30/23 11:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	456	mg/L	20.0	8.7	1		06/05/23 07:49		
9040 pH									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		06/06/23 09:17		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-315 **Lab ID: 40262930003** Collected: 05/30/23 11:40 Received: 06/01/23 10:05 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	3.9	mg/L	2.0	0.43	1		06/16/23 16:28	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/23 16:28	16984-48-8	
Sulfate	8.8	mg/L	2.0	0.44	1		06/16/23 16:28	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO ₃	495	mg/L	50.0	14.9	2		06/05/23 10:41		
353.2 Nitrogen, NO₂/NO₃ pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO ₂ plus NO ₃	0.57	mg/L	0.25	0.059	1		06/06/23 13:56		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: FIELD BLANK MOD10-11 Lab ID: 40262930004 Collected: 05/30/23 12:10 Received: 06/01/23 10:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	06/02/23 06:08	06/05/23 17:25	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	06/02/23 06:08	06/05/23 17:25	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	06/02/23 06:08	06/05/23 17:25	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	06/02/23 06:08	06/05/23 17:25		
Zinc	<11.6	ug/L	40.0	11.6	1	06/02/23 06:08	06/05/23 17:25	7440-66-6	
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	06/06/23 06:22	06/10/23 16:12	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	06/06/23 06:22	06/10/23 16:12	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	06/06/23 06:22	06/10/23 16:12	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	06/06/23 06:22	06/15/23 18:39	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	06/06/23 06:22	06/15/23 18:39	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	06/06/23 06:22	06/10/23 16:12	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	06/06/23 06:22	06/10/23 16:12	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	06/06/23 06:22	06/10/23 16:12	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	06/06/23 06:22	06/10/23 16:12	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	06/06/23 06:22	06/10/23 16:12	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	06/06/23 06:22	06/15/23 18:39	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	06/06/23 06:22	06/10/23 16:12	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	06/06/23 06:22	06/10/23 16:12	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	06/06/23 06:22	06/10/23 16:12	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	06/05/23 10:10	06/06/23 07:54	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		06/05/23 07:50		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.7	Std. Units	0.10	0.010	1		06/06/23 09:32		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		06/16/23 16:42	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		06/16/23 16:42	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		06/16/23 16:42	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		06/05/23 10:42		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: FIELD BLANK MOD10-11 **Lab ID: 40262930004** Collected: 05/30/23 12:10 Received: 06/01/23 10:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay								
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		06/06/23 13:56		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 446548	Analysis Method: EPA 7470
QC Batch Method: EPA 7470	Analysis Description: 7470 Mercury
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2563218 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	06/06/23 07:21	

LABORATORY CONTROL SAMPLE: 2563219

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2563220 2563221

Parameter	Units	40262948001		2563220		2563221		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MS Spike Conc.	MSD Result	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	<0.066	5	5	5	4.9	4.9	98	98	85-115	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 446389	Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A	Analysis Description: 6010D MET
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2562330 Matrix: Water

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	<3.4	10.0	06/05/23 16:40	
Manganese	ug/L	<1.5	5.0	06/05/23 16:40	
Silver	ug/L	<3.2	10.0	06/05/23 16:40	
Total Hardness by 2340B	mg/L	<1.0	5.4	06/05/23 16:40	
Zinc	ug/L	<11.6	40.0	06/05/23 16:40	

LABORATORY CONTROL SAMPLE: 2562331

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	266	106	80-120	
Manganese	ug/L	250	269	108	80-120	
Silver	ug/L	125	129	104	80-120	
Total Hardness by 2340B	mg/L		70.5			
Zinc	ug/L	250	266	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2562332 2562333

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40262953001 Result	Spike Conc.	Spike Conc.	Result						
Copper	ug/L	<3.4	250	250	263	258	105	103	75-125	2	20
Manganese	ug/L	<1.5	250	250	265	261	106	104	75-125	2	20
Silver	ug/L	<3.2	125	125	129	126	103	101	75-125	2	20
Total Hardness by 2340B	mg/L	290			368	345				6	20
Zinc	ug/L	<11.6	250	250	259	255	104	102	75-125	2	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

QC Batch: 446643 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2563575 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	06/10/23 15:12	
Arsenic	ug/L	<0.28	1.0	06/10/23 15:12	
Barium	ug/L	<0.70	2.3	06/10/23 15:12	
Beryllium	ug/L	<0.25	1.0	06/10/23 15:12	
Boron	ug/L	<3.0	10.0	06/10/23 15:12	
Cadmium	ug/L	<0.15	1.0	06/10/23 15:12	
Calcium	ug/L	<76.2	254	06/10/23 15:12	
Chromium	ug/L	<1.0	3.4	06/10/23 15:12	
Cobalt	ug/L	<0.12	1.0	06/10/23 15:12	
Lead	ug/L	<0.24	1.0	06/10/23 15:12	
Lithium	ug/L	<0.22	1.0	06/10/23 15:12	
Molybdenum	ug/L	<0.44	1.5	06/10/23 15:12	
Selenium	ug/L	<0.32	1.1	06/10/23 15:12	
Thallium	ug/L	<0.14	1.0	06/10/23 15:12	

LABORATORY CONTROL SAMPLE: 2563576

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	255	102	80-120	
Arsenic	ug/L	250	262	105	80-120	
Barium	ug/L	250	251	100	80-120	
Beryllium	ug/L	250	265	106	80-120	
Boron	ug/L	250	247	99	80-120	
Cadmium	ug/L	250	255	102	80-120	
Calcium	ug/L	10000	10600	106	80-120	
Chromium	ug/L	250	253	101	80-120	
Cobalt	ug/L	250	250	100	80-120	
Lead	ug/L	250	245	98	80-120	
Lithium	ug/L	250	250	100	80-120	
Molybdenum	ug/L	250	246	98	80-120	
Selenium	ug/L	250	267	107	80-120	
Thallium	ug/L	250	237	95	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Parameter	Units	40262930001		2563577		2563578		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Antimony	ug/L	<0.15	250	250	257	257	103	103	75-125	0	20			
Arsenic	ug/L	<0.28	250	250	261	264	104	105	75-125	1	20			
Barium	ug/L	47.8	250	250	307	308	104	104	75-125	0	20			
Beryllium	ug/L	<0.25	250	250	267	270	107	108	75-125	1	20			
Boron	ug/L	191	250	250	451	458	104	107	75-125	1	20			
Cadmium	ug/L	<0.15	250	250	255	256	102	102	75-125	1	20			
Calcium	ug/L	69100	10000	10000	81500	80800	124	116	75-125	1	20			
Chromium	ug/L	1.2J	250	250	255	258	101	103	75-125	1	20			
Cobalt	ug/L	<0.12	250	250	248	252	99	101	75-125	2	20			
Lead	ug/L	<0.24	250	250	253	255	101	102	75-125	1	20			
Lithium	ug/L	0.68J	250	250	253	254	101	101	75-125	1	20			
Molybdenum	ug/L	1.5	250	250	258	258	102	103	75-125	0	20			
Selenium	ug/L	0.59J	250	250	261	262	104	104	75-125	0	20			
Thallium	ug/L	0.21J	250	250	250	253	100	101	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 446511	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2563103 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	06/05/23 07:48	

LABORATORY CONTROL SAMPLE: 2563104

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	593	554	93	80-120	

SAMPLE DUPLICATE: 2563159

Parameter	Units	40262930001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	334	350	5	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 446640

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

SAMPLE DUPLICATE: 2563573

Parameter	Units	40262882001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.3	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

QC Batch: 447068 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: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2566193 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	06/16/23 15:02	
Fluoride	mg/L	<0.095	0.32	06/16/23 15:02	
Sulfate	mg/L	<0.44	2.0	06/16/23 15:02	

LABORATORY CONTROL SAMPLE: 2566194

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.9	99	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	20.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2566195 2566196

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40262931002 Result	Spike Conc.	Spike Conc.	Result								
Chloride	mg/L	86.5	100	100	184	184	97	97	90-110	0	15		
Fluoride	mg/L	<0.48	10	10	10	10.1	100	101	90-110	1	15		
Sulfate	mg/L	14.4	100	100	115	115	101	101	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

QC Batch: 446512 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: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2563105 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	06/05/23 10:35	

LABORATORY CONTROL SAMPLE: 2563106

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2563107 2563108

Parameter	Units	40262930001		2563108		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Alkalinity, Total as CaCO3	mg/L	302	200	200	490	486	94	92	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2563109 2563110

Parameter	Units	40262980005		2563110		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Alkalinity, Total as CaCO3	mg/L	138	200	200	343	334	102	98	90-110	3	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 446621	Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2	Analysis Description: 353.2 Nitrate + Nitrite, preserved
	Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2563495 Matrix: Water
Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	06/06/23 13:35	

LABORATORY CONTROL SAMPLE: 2563496

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.7	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2563497 2563498

Parameter	Units	40262917005		2563497		2563498		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, NO2 plus NO3	mg/L	8.4	12.5	12.5	22.0	21.2	109	103	90-110	3	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2563499 2563500

Parameter	Units	40262917018		2563499		2563500		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, NO2 plus NO3	mg/L	3.9	12.5	12.5	17.1	17.0	106	104	90-110	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

Sample: MW-313 **Lab ID: 40262930001** Collected: 05/30/23 09:45 Received: 06/01/23 10:05 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	-0.257 ± 0.771 (1.61) C:NA T:91%	pCi/L	06/20/23 17:09	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.0341 ± 0.261 (0.604) C:85% T:92%	pCi/L	06/16/23 15:27	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.0341 ± 1.03 (2.21)	pCi/L	06/21/23 13:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-314 **Lab ID: 40262930002** Collected: 05/30/23 10:45 Received: 06/01/23 10:05 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	-0.0795 ± 0.412 (0.955) C:NA T:96%	pCi/L	06/20/23 17:09	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.162 ± 0.364 (0.806) C:81% T:85%	pCi/L	06/16/23 15:27	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.162 ± 0.776 (1.76)	pCi/L	06/21/23 13:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: MW-315 **Lab ID: 40262930003** Collected: 05/30/23 11:40 Received: 06/01/23 10:05 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	-0.0827 ± 0.378 (0.890) C:NA T:95%	pCi/L	06/20/23 17:09	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.666 ± 0.407 (0.759) C:79% T:91%	pCi/L	06/16/23 15:27	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.666 ± 0.785 (1.65)	pCi/L	06/21/23 13:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Sample: FIELD BLANK MOD10-11 **Lab ID:** 40262930004 Collected: 05/30/23 12:10 Received: 06/01/23 10:05 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	0.606 ± 0.475 (0.558) C:NA T:89%	pCi/L	06/20/23 17:09	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.712 ± 0.434 (0.790) C:83% T:87%	pCi/L	06/16/23 15:27	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	1.32 ± 0.909 (1.35)	pCi/L	06/21/23 13:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 592606

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: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2879376

Matrix: Water

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.967 ± 0.438 (0.719) C:85% T:87%	pCi/L	06/16/23 15:24	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

QC Batch: 592605

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: 40262930001, 40262930002, 40262930003, 40262930004

METHOD BLANK: 2879375

Matrix: Water

Associated Lab Samples: 40262930001, 40262930002, 40262930003, 40262930004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.115 ± 0.276 (0.533) C:NA T:93%	pCi/L	06/20/23 16:56	

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALIFIERS

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

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

H6 Analysis initiated outside of the 15 minute EPA required holding time.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 WPL-COLUMB CCR LF MOD
Pace Project No.: 40262930

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40262930001	MW-313	EPA 3010A	446389	EPA 6010D	446472
40262930002	MW-314	EPA 3010A	446389	EPA 6010D	446472
40262930003	MW-315	EPA 3010A	446389	EPA 6010D	446472
40262930004	FIELD BLANK MOD10-11	EPA 3010A	446389	EPA 6010D	446472
40262930001	MW-313	EPA 3010A	446643	EPA 6020B	446713
40262930002	MW-314	EPA 3010A	446643	EPA 6020B	446713
40262930003	MW-315	EPA 3010A	446643	EPA 6020B	446713
40262930004	FIELD BLANK MOD10-11	EPA 3010A	446643	EPA 6020B	446713
40262930001	MW-313	EPA 7470	446548	EPA 7470	446600
40262930002	MW-314	EPA 7470	446548	EPA 7470	446600
40262930003	MW-315	EPA 7470	446548	EPA 7470	446600
40262930004	FIELD BLANK MOD10-11	EPA 7470	446548	EPA 7470	446600
40262930001	MW-313				
40262930002	MW-314				
40262930003	MW-315				
40262930001	MW-313	EPA 903.1	592605		
40262930002	MW-314	EPA 903.1	592605		
40262930003	MW-315	EPA 903.1	592605		
40262930004	FIELD BLANK MOD10-11	EPA 903.1	592605		
40262930001	MW-313	EPA 904.0	592606		
40262930002	MW-314	EPA 904.0	592606		
40262930003	MW-315	EPA 904.0	592606		
40262930004	FIELD BLANK MOD10-11	EPA 904.0	592606		
40262930001	MW-313	Total Radium Calculation	596578		
40262930002	MW-314	Total Radium Calculation	596578		
40262930003	MW-315	Total Radium Calculation	596578		
40262930004	FIELD BLANK MOD10-11	Total Radium Calculation	596578		
40262930001	MW-313	SM 2540C	446511		
40262930002	MW-314	SM 2540C	446511		
40262930003	MW-315	SM 2540C	446511		
40262930004	FIELD BLANK MOD10-11	SM 2540C	446511		
40262930001	MW-313	EPA 9040	446640		
40262930002	MW-314	EPA 9040	446640		
40262930003	MW-315	EPA 9040	446640		
40262930004	FIELD BLANK MOD10-11	EPA 9040	446640		
40262930001	MW-313	EPA 300.0	447068		
40262930002	MW-314	EPA 300.0	447068		
40262930003	MW-315	EPA 300.0	447068		
40262930004	FIELD BLANK MOD10-11	EPA 300.0	447068		
40262930001	MW-313	EPA 310.2	446512		
40262930002	MW-314	EPA 310.2	446512		
40262930003	MW-315	EPA 310.2	446512		
40262930004	FIELD BLANK MOD10-11	EPA 310.2	446512		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 WPL-COLUMB CCR LF MOD

Pace Project No.: 40262930

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40262930001	MW-313	EPA 353.2	446621		
40262930002	MW-314	EPA 353.2	446621		
40262930003	MW-315	EPA 353.2	446621		
40262930004	FIELD BLANK MOD10-11	EPA 353.2	446621		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40262930

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers
 Address: 2530 Dwyer Dr, Madison, WI
 Report To: Meghan Blodgett 3378
 Copy To:

Billing Information:
25223067.00
 Email To: mblodgett@scsengineers.com
 Site Collection Info/Address:
WPL - Columbia

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

Customer Project Name/Number:
 State: WI County/City: Portage Time Zone Collected: [] PT [] MT [] CT [] ET
 Phone: 414-897-4253 Site/Facility ID #:
 Email: eschroeder@scsengineers.com Compliance Monitoring? [] Yes [] No
 Collected By (print): Ethan Schaefer Purchase Order #: DW PWS ID #:
 Collected By (signature): [Signature] Quote #: DW Location Code:
 Sample Disposal: [] Dispose as appropriate [] Return [] Archive [] Hold Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day Field Filtered (if applicable): [] Yes [X] No
 Turnaround Date Required: Immediately Packed on Ice: [] Yes [] No
 Analysis: _____

Analyses

TDS, Chloride, Fluoride, Sulfate	OH, alkalinity	Radium 226	Radium 228	Metals, hardness	Nitrate + Nitrite
----------------------------------	----------------	------------	------------	------------------	-------------------

Lab Profile/Line:
 Lab Sample Receipt Checklist:
 Custody Seals Present/Intact Y N NA
 Custody Signatures Present Y N NA
 Collector Signature Present Y N NA
 Bottles Intact Y N NA
 Correct Bottles Y N NA
 Sufficient Volume Y N NA
 Samples Received on Ice Y N NA
 VOA - Headspace Acceptable Y N NA
 USDA Regulated Solids Y N NA
 Samples in Holding Time Y N NA
 Residual Chlorine Present Y N NA
 Cl Strips: _____
 Sample pH Acceptable Y N NA
 pH Strips: _____
 Sulfide Present Y N NA
 Lead Acetate Strips: _____
 LAB USE ONLY:
 Lab Sample # / Comments:

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns
			Date	Time	Date	Time		
MW-313	GW	G	5/30	945			6	X X X X X X
MW-314	GW	G	5/30	1045			6	X X X X X X
MW-315	GW	G	5/30	1140			6	X X X X X X
Field Blank Mod 1041		G	5/30	1210			5	X X X X X X

Customer Remarks / Special Conditions / Possible Hazards:
 Type of Ice Used: Wet Blue Dry None
 Packing Material Used: [Signature]
 Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A
 Lab Tracking #: 2839165
 Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
 Temp Blank Received: Y N NA
 Therm ID#: _____
 Cooler 1 Temp Upon Receipt: _____ °C
 Cooler 1 Therm Corr. Factor: _____ °C
 Cooler 1 Corrected Temp: _____ °C
 Comments:

Relinquished by/Company: (Signature) [Signature] SCS
 Date/Time: 5/31/23 1500

Received by/Company: (Signature) [Signature]
 Date/Time: 6/1/23 1005

Relinquished by/Company: (Signature) [Signature] CS Logistics
 Date/Time: 6/1/23 1005

Trip Blank Received: Y N NA
 HCL MeOH TSP Other
 Non Conformance(s): _____
 YES / NO of: _____

Sample Preservation Receipt Form

Client Name: SCS Engineers

Project # 40262930

All containers needing preservation have been checked and noted below.

Yes No N/A

Lab Lot# of pH paper: 1000703

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

Initial when completed SG Date/Time

Page Lab #	Glass						Plastic						Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)							
	AG1U	BG1U	AG1H	AG4S	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			
001								2																					X								2.5 / 5
002								2																						X							2.5 / 5
003								2																						X							2.5 / 5
004								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

6/1/23 SG

Exceptions to preservation check VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: 1

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 <i>1L poly HDMS</i>
			GN 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineers
 Courier: CS Logistics Fed Ex Speedee UPS Walto
 Client Pace Other: _____

WO#: **40262930**

 40262930

Tracking #: _____
 Custody Seal on Cooler/Box Present: yes no Seats 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-9 Type of Ice: Wet Blue Dry None Meltwater Only
 Cooler Temperature Uncorr: 0.5 iCorr: 1.5

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

Person examining contents:
 Date: 6/11/23 Initials: SG
 Labeled By Initials: NP

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

Chain of Custody Present: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time: - DI VOA Samples frozen upon receipt <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Date/Time:
Short Hold Time Analysis (<72hr): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Correct Type: <u>Pace Green Bay</u> , Pace IR, Non-Pace	
Containers Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: <u>W</u>	12. <u>002 time "1035"</u> <u>6/11/23 SG</u>
Trip Blank Present: <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Trip Blank Custody Seals Present <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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 logir
 Page 2 of 2



July 26, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222157 WPL-COLUMBIA
Pace Project No.: 40264568

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on July 01, 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 Burriss, 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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CERTIFICATIONS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE SUMMARY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40264568001	MW-313	Water	06/29/23 11:50	07/01/23 09:00
40264568002	MW-314	Water	06/29/23 12:40	07/01/23 09:00
40264568003	MW-315	Water	06/29/23 13:20	07/01/23 09:00
40264568004	FIELD BLANK MOD 10-11	Water	06/29/23 11:30	07/01/23 09:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
40264568001	MW-313	EPA 6010D	SIS	5	PASI-G		
		EPA 6020B	TXW	14	PASI-G		
		EPA 7470	YER	1	PASI-G		
			AG1	7	PASI-G		
		EPA 903.1	CLM	1	PASI-PA		
		EPA 904.0	JJS1	1	PASI-PA		
		Total Radium Calculation	JAL	1	PASI-PA		
		SM 2540C	SRK	1	PASI-G		
		EPA 9040	HML	1	PASI-G		
		EPA 300.0	DAW	3	PASI-G		
		EPA 310.2	MT	1	PASI-G		
		EPA 353.2	MT	1	PASI-G		
		40264568002	MW-314	EPA 6010D	SIS	5	PASI-G
				EPA 6020B	TXW	14	PASI-G
EPA 7470	YER			1	PASI-G		
	AG1			7	PASI-G		
EPA 903.1	CLM			1	PASI-PA		
EPA 904.0	JJS1			1	PASI-PA		
Total Radium Calculation	JAL			1	PASI-PA		
SM 2540C	SRK			1	PASI-G		
EPA 9040	HML			1	PASI-G		
EPA 300.0	DAW			3	PASI-G		
EPA 310.2	MT			1	PASI-G		
EPA 353.2	MT			1	PASI-G		
40264568003	MW-315			EPA 6010D	SIS	5	PASI-G
				EPA 6020B	TXW	14	PASI-G
		EPA 7470	YER	1	PASI-G		
			AG1	7	PASI-G		
		EPA 903.1	CLM	1	PASI-PA		
		EPA 904.0	JJS1	1	PASI-PA		
		Total Radium Calculation	JAL	1	PASI-PA		
		SM 2540C	SRK	1	PASI-G		
		EPA 9040	HML	1	PASI-G		
		EPA 300.0	DAW	3	PASI-G		
		EPA 310.2	MT	1	PASI-G		
		EPA 353.2	MT	1	PASI-G		
		40264568004	FIELD BLANK MOD 10-11	EPA 6010D	SIS	5	PASI-G

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	TXW	14	PASI-G
		EPA 7470	YER	1	PASI-G
		EPA 903.1	CLM	1	PASI-PA
		EPA 904.0	JJS1	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	HML	1	PASI-G
		EPA 300.0	DAW	3	PASI-G
		EPA 310.2	MT	1	PASI-G
		EPA 353.2	MT	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SUMMARY OF DETECTION

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
40264568001	MW-313					
EPA 6010D	Copper	3.7J	ug/L	10.0	07/05/23 19:06	B
EPA 6010D	Manganese	82.3	ug/L	5.0	07/05/23 19:06	
EPA 6010D	Total Hardness by 2340B	364	mg/L	5.4	07/05/23 19:06	
EPA 6020B	Barium	47.0	ug/L	2.3	07/07/23 09:55	
EPA 6020B	Boron	189	ug/L	10.0	07/07/23 09:55	
EPA 6020B	Calcium	71900	ug/L	254	07/07/23 09:55	
EPA 6020B	Chromium	1.4J	ug/L	3.4	07/07/23 09:55	
EPA 6020B	Lithium	1.0	ug/L	1.0	07/07/23 09:55	B
EPA 6020B	Molybdenum	1.3J	ug/L	1.5	07/07/23 09:55	
EPA 6020B	Selenium	0.65J	ug/L	1.1	07/07/23 09:55	
	Field pH	7.41	Std. Units		06/29/23 11:50	
	Field Specific Conductance	632.0	umhos/cm		06/29/23 11:50	
	Oxygen, Dissolved	7.17	mg/L		06/29/23 11:50	
	REDOX	249.4	mV		06/29/23 11:50	
	Turbidity	0.00	NTU		06/29/23 11:50	
	Static Water Level	784.67	feet		06/29/23 11:50	
	Temperature, Water (C)	11.2	deg C		06/29/23 11:50	
EPA 903.1	Radium-226	-0.132 ± 0.334 (0.731)	pCi/L		07/24/23 14:57	
EPA 904.0	Radium-228	C:NA T:83% 0.350 ± 0.381 (0.796)	pCi/L		07/14/23 15:05	
		C:84% T:83%				
Total Radium Calculation	Total Radium	0.350 ± 0.715 (1.53)	pCi/L		07/25/23 10:45	
SM 2540C	Total Dissolved Solids	408	mg/L	20.0	07/03/23 14:12	
EPA 9040	pH at 25 Degrees C	7.6	Std. Units	0.10	07/03/23 13:38	H6
EPA 300.0	Chloride	22.8	mg/L	2.0	07/13/23 05:48	
EPA 300.0	Fluoride	0.19J	mg/L	0.32	07/13/23 05:48	
EPA 300.0	Sulfate	19.9	mg/L	2.0	07/13/23 05:48	
EPA 310.2	Alkalinity, Total as CaCO3	300	mg/L	25.0	07/05/23 13:14	
EPA 353.2	Nitrogen, NO2 plus NO3	6.8	mg/L	0.25	07/12/23 15:30	
40264568002	MW-314					
EPA 6010D	Manganese	11.1	ug/L	5.0	07/05/23 19:07	
EPA 6010D	Total Hardness by 2340B	521	mg/L	5.4	07/05/23 19:07	
EPA 6020B	Barium	41.3	ug/L	2.3	07/07/23 10:00	
EPA 6020B	Boron	15.4	ug/L	10.0	07/07/23 10:00	
EPA 6020B	Calcium	103000	ug/L	254	07/07/23 10:00	
EPA 6020B	Cobalt	0.14J	ug/L	1.0	07/07/23 10:00	
EPA 6020B	Lithium	0.94J	ug/L	1.0	07/07/23 10:00	B
EPA 6020B	Molybdenum	1.3J	ug/L	1.5	07/07/23 10:00	
	Field pH	7.20	Std. Units		06/29/23 12:40	
	Field Specific Conductance	807	umhos/cm		06/29/23 12:40	
	Oxygen, Dissolved	6.53	mg/L		06/29/23 12:40	
	REDOX	254.0	mV		06/29/23 12:40	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SUMMARY OF DETECTION

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab Sample ID	Client Sample ID	Result	Units	Report Limit	Analyzed	Qualifiers
Method	Parameters					
40264568002	MW-314					
	Turbidity	0.00	NTU		06/29/23 12:40	
	Static Water Level	784.95	feet		06/29/23 12:40	
	Temperature, Water (C)	11.0	deg C		06/29/23 12:40	
EPA 903.1	Radium-226	0.0476 ± 0.385 (0.755)	pCi/L		07/24/23 14:57	
EPA 904.0	Radium-228	C:NA T:80% 0.374 ± 0.395 (0.819)	pCi/L		07/14/23 15:06	
		C:83% T:80%				
Total Radium Calculation	Total Radium	0.422 ± 0.780 (1.57)	pCi/L		07/25/23 10:45	
SM 2540C	Total Dissolved Solids	470	mg/L	20.0	07/03/23 14:13	
EPA 9040	pH at 25 Degrees C	7.3	Std. Units	0.10	07/03/23 13:44	H6
EPA 300.0	Chloride	2.4	mg/L	2.0	07/13/23 06:02	
EPA 300.0	Sulfate	3.2	mg/L	2.0	07/13/23 06:02	
EPA 310.2	Alkalinity, Total as CaCO3	466	mg/L	25.0	07/05/23 13:17	
EPA 353.2	Nitrogen, NO2 plus NO3	3.1	mg/L	0.25	07/12/23 15:31	
40264568003	MW-315					
EPA 6010D	Copper	3.4J	ug/L	10.0	07/05/23 19:09	B
EPA 6010D	Manganese	103	ug/L	5.0	07/05/23 19:09	
EPA 6010D	Total Hardness by 2340B	530	mg/L	5.4	07/05/23 19:09	
EPA 6020B	Arsenic	0.38J	ug/L	1.0	07/07/23 10:05	
EPA 6020B	Barium	52.7	ug/L	2.3	07/07/23 10:05	
EPA 6020B	Boron	13.3	ug/L	10.0	07/07/23 10:05	
EPA 6020B	Calcium	110000	ug/L	254	07/07/23 10:05	
EPA 6020B	Chromium	1.6J	ug/L	3.4	07/07/23 10:05	
EPA 6020B	Cobalt	0.21J	ug/L	1.0	07/07/23 10:05	
EPA 6020B	Lead	0.32J	ug/L	1.0	07/07/23 10:05	
EPA 6020B	Lithium	1.2	ug/L	1.0	07/07/23 10:05	B
EPA 6020B	Selenium	0.58J	ug/L	1.1	07/07/23 10:05	
	Field pH	7.13	Std. Units		06/29/23 13:20	
	Field Specific Conductance	834	umhos/cm		06/29/23 13:20	
	Oxygen, Dissolved	5.40	mg/L		06/29/23 13:20	
	REDOX	230.7	mV		06/29/23 13:20	
	Turbidity	0.00	NTU		06/29/23 13:20	
	Static Water Level	785.17	feet		06/29/23 13:20	
	Temperature, Water (C)	11.0	deg C		06/29/23 13:20	
EPA 903.1	Radium-226	-0.117 ± 0.276 (0.619)	pCi/L		07/24/23 14:57	
EPA 904.0	Radium-228	C:NA T:89% 0.464 ± 0.345 (0.669)	pCi/L		07/14/23 15:06	
		C:78% T:89%				

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SUMMARY OF DETECTION

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab Sample ID Method	Client Sample ID Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40264568003	MW-315					
Total Radium Calculation	Total Radium	0.464 ± 0.621 (1.29)	pCi/L		07/25/23 10:45	
SM 2540C	Total Dissolved Solids	482	mg/L	20.0	07/03/23 14:13	
EPA 9040	pH at 25 Degrees C	7.1	Std. Units	0.10	07/03/23 13:45	H6
EPA 300.0	Chloride	3.3	mg/L	2.0	07/13/23 06:17	
EPA 300.0	Sulfate	7.0	mg/L	2.0	07/13/23 06:17	
EPA 310.2	Alkalinity, Total as CaCO3	493	mg/L	25.0	07/05/23 13:18	
EPA 353.2	Nitrogen, NO2 plus NO3	0.58	mg/L	0.25	07/12/23 14:59	
40264568004	FIELD BLANK MOD 10-11					
EPA 6020B	Lithium	0.48J	ug/L	1.0	07/07/23 09:34	B
EPA 903.1	Radium-226	-0.0447 ± 0.382 (0.779) C:NA T:84%	pCi/L		07/24/23 14:57	
EPA 904.0	Radium-228	0.414 ± 0.372 (0.755) C:84% T:84%	pCi/L		07/14/23 15:06	
Total Radium Calculation	Total Radium	0.414 ± 0.754 (1.53)	pCi/L		07/25/23 10:45	
EPA 9040	pH at 25 Degrees C	6.7	Std. Units	0.10	07/03/23 13:52	H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-313 Lab ID: 40264568001 Collected: 06/29/23 11:50 Received: 07/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	3.7J	ug/L	10.0	3.4	1	07/05/23 05:23	07/05/23 19:06	7440-50-8	B
Manganese	82.3	ug/L	5.0	1.5	1	07/05/23 05:23	07/05/23 19:06	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	07/05/23 05:23	07/05/23 19:06	7440-22-4	
Total Hardness by 2340B	364	mg/L	5.4	1.0	1	07/05/23 05:23	07/05/23 19:06		
Zinc	<11.6	ug/L	40.0	11.6	1	07/05/23 05:23	07/05/23 19:06	7440-66-6	
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	07/05/23 06:10	07/07/23 09:55	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	07/05/23 06:10	07/07/23 09:55	7440-38-2	
Barium	47.0	ug/L	2.3	0.70	1	07/05/23 06:10	07/07/23 09:55	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	07/05/23 06:10	07/07/23 09:55	7440-41-7	
Boron	189	ug/L	10.0	3.0	1	07/05/23 06:10	07/07/23 09:55	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	07/05/23 06:10	07/07/23 09:55	7440-43-9	
Calcium	71900	ug/L	254	76.2	1	07/05/23 06:10	07/07/23 09:55	7440-70-2	
Chromium	1.4J	ug/L	3.4	1.0	1	07/05/23 06:10	07/07/23 09:55	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	07/05/23 06:10	07/07/23 09:55	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	07/05/23 06:10	07/07/23 09:55	7439-92-1	
Lithium	1.0	ug/L	1.0	0.22	1	07/05/23 06:10	07/07/23 09:55	7439-93-2	B
Molybdenum	1.3J	ug/L	1.5	0.44	1	07/05/23 06:10	07/07/23 09:55	7439-98-7	
Selenium	0.65J	ug/L	1.1	0.32	1	07/05/23 06:10	07/07/23 09:55	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/05/23 06:10	07/07/23 09:55	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	07/11/23 10:42	07/12/23 08:13	7439-97-6	1q
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.41	Std. Units			1		06/29/23 11:50		
Field Specific Conductance	632.0	umhos/cm			1		06/29/23 11:50		
Oxygen, Dissolved	7.17	mg/L			1		06/29/23 11:50	7782-44-7	
REDOX	249.4	mV			1		06/29/23 11:50		
Turbidity	0.00	NTU			1		06/29/23 11:50		
Static Water Level	784.67	feet			1		06/29/23 11:50		
Temperature, Water (C)	11.2	deg C			1		06/29/23 11:50		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	408	mg/L	20.0	8.7	1		07/03/23 14:12		
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		07/03/23 13:38		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-313 Lab ID: 40264568001 Collected: 06/29/23 11:50 Received: 07/01/23 09:00 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	22.8	mg/L	2.0	0.43	1		07/13/23 05:48	16887-00-6	
Fluoride	0.19J	mg/L	0.32	0.095	1		07/13/23 05:48	16984-48-8	
Sulfate	19.9	mg/L	2.0	0.44	1		07/13/23 05:48	14808-79-8	
310.2 Alkalinity		Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay							
Alkalinity, Total as CaCO3	300	mg/L	25.0	7.4	1		07/05/23 13:14		
353.2 Nitrogen, NO2/NO3 pres.		Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay							
Nitrogen, NO2 plus NO3	6.8	mg/L	0.25	0.059	1		07/12/23 15:30		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-314 Lab ID: 40264568002 Collected: 06/29/23 12:40 Received: 07/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	07/05/23 05:23	07/05/23 19:07	7440-50-8	
Manganese	11.1	ug/L	5.0	1.5	1	07/05/23 05:23	07/05/23 19:07	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	07/05/23 05:23	07/05/23 19:07	7440-22-4	
Total Hardness by 2340B	521	mg/L	5.4	1.0	1	07/05/23 05:23	07/05/23 19:07		
Zinc	<11.6	ug/L	40.0	11.6	1	07/05/23 05:23	07/05/23 19:07	7440-66-6	
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	07/05/23 06:10	07/07/23 10:00	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	07/05/23 06:10	07/07/23 10:00	7440-38-2	
Barium	41.3	ug/L	2.3	0.70	1	07/05/23 06:10	07/07/23 10:00	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	07/05/23 06:10	07/07/23 10:00	7440-41-7	
Boron	15.4	ug/L	10.0	3.0	1	07/05/23 06:10	07/07/23 10:00	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	07/05/23 06:10	07/07/23 10:00	7440-43-9	
Calcium	103000	ug/L	254	76.2	1	07/05/23 06:10	07/07/23 10:00	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	07/05/23 06:10	07/07/23 10:00	7440-47-3	
Cobalt	0.14J	ug/L	1.0	0.12	1	07/05/23 06:10	07/07/23 10:00	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	07/05/23 06:10	07/07/23 10:00	7439-92-1	
Lithium	0.94J	ug/L	1.0	0.22	1	07/05/23 06:10	07/07/23 10:00	7439-93-2	B
Molybdenum	1.3J	ug/L	1.5	0.44	1	07/05/23 06:10	07/07/23 10:00	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	07/05/23 06:10	07/07/23 10:00	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/05/23 06:10	07/07/23 10:00	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	07/11/23 10:42	07/12/23 08:28	7439-97-6	1q
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.20	Std. Units			1		06/29/23 12:40		
Field Specific Conductance	807	umhos/cm			1		06/29/23 12:40		
Oxygen, Dissolved	6.53	mg/L			1		06/29/23 12:40	7782-44-7	
REDOX	254.0	mV			1		06/29/23 12:40		
Turbidity	0.00	NTU			1		06/29/23 12:40		
Static Water Level	784.95	feet			1		06/29/23 12:40		
Temperature, Water (C)	11.0	deg C			1		06/29/23 12:40		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	470	mg/L	20.0	8.7	1		07/03/23 14:13		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.3	Std. Units	0.10	0.010	1		07/03/23 13:44		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-314 Lab ID: 40264568002 Collected: 06/29/23 12:40 Received: 07/01/23 09:00 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	2.4	mg/L	2.0	0.43	1		07/13/23 06:02	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		07/13/23 06:02	16984-48-8	
Sulfate	3.2	mg/L	2.0	0.44	1		07/13/23 06:02	14808-79-8	
310.2 Alkalinity		Analytical Method: EPA 310.2 Pace Analytical Services - Green Bay							
Alkalinity, Total as CaCO3	466	mg/L	25.0	7.4	1		07/05/23 13:17		
353.2 Nitrogen, NO2/NO3 pres.		Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay							
Nitrogen, NO2 plus NO3	3.1	mg/L	0.25	0.059	1		07/12/23 15:31		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-315 **Lab ID: 40264568003** Collected: 06/29/23 13:20 Received: 07/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	3.4J	ug/L	10.0	3.4	1	07/05/23 05:23	07/05/23 19:09	7440-50-8	B
Manganese	103	ug/L	5.0	1.5	1	07/05/23 05:23	07/05/23 19:09	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	07/05/23 05:23	07/05/23 19:09	7440-22-4	
Total Hardness by 2340B	530	mg/L	5.4	1.0	1	07/05/23 05:23	07/05/23 19:09		
Zinc	<11.6	ug/L	40.0	11.6	1	07/05/23 05:23	07/05/23 19:09	7440-66-6	
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	07/05/23 06:10	07/07/23 10:05	7440-36-0	
Arsenic	0.38J	ug/L	1.0	0.28	1	07/05/23 06:10	07/07/23 10:05	7440-38-2	
Barium	52.7	ug/L	2.3	0.70	1	07/05/23 06:10	07/07/23 10:05	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	07/05/23 06:10	07/07/23 10:05	7440-41-7	
Boron	13.3	ug/L	10.0	3.0	1	07/05/23 06:10	07/07/23 10:05	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	07/05/23 06:10	07/07/23 10:05	7440-43-9	
Calcium	110000	ug/L	254	76.2	1	07/05/23 06:10	07/07/23 10:05	7440-70-2	
Chromium	1.6J	ug/L	3.4	1.0	1	07/05/23 06:10	07/07/23 10:05	7440-47-3	
Cobalt	0.21J	ug/L	1.0	0.12	1	07/05/23 06:10	07/07/23 10:05	7440-48-4	
Lead	0.32J	ug/L	1.0	0.24	1	07/05/23 06:10	07/07/23 10:05	7439-92-1	
Lithium	1.2	ug/L	1.0	0.22	1	07/05/23 06:10	07/07/23 10:05	7439-93-2	B
Molybdenum	<0.44	ug/L	1.5	0.44	1	07/05/23 06:10	07/07/23 10:05	7439-98-7	
Selenium	0.58J	ug/L	1.1	0.32	1	07/05/23 06:10	07/07/23 10:05	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/05/23 06:10	07/07/23 10:05	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Pace Analytical Services - Green Bay									
Mercury	<0.066	ug/L	0.20	0.066	1	07/11/23 10:42	07/12/23 08:30	7439-97-6	1q
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.13	Std. Units			1		06/29/23 13:20		
Field Specific Conductance	834	umhos/cm			1		06/29/23 13:20		
Oxygen, Dissolved	5.40	mg/L			1		06/29/23 13:20	7782-44-7	
REDOX	230.7	mV			1		06/29/23 13:20		
Turbidity	0.00	NTU			1		06/29/23 13:20		
Static Water Level	785.17	feet			1		06/29/23 13:20		
Temperature, Water (C)	11.0	deg C			1		06/29/23 13:20		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	482	mg/L	20.0	8.7	1		07/03/23 14:13		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.1	Std. Units	0.10	0.010	1		07/03/23 13:45		H6

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-315 Lab ID: 40264568003 Collected: 06/29/23 13:20 Received: 07/01/23 09:00 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	3.3	mg/L	2.0	0.43	1		07/13/23 06:17	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		07/13/23 06:17	16984-48-8	
Sulfate	7.0	mg/L	2.0	0.44	1		07/13/23 06:17	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	493	mg/L	25.0	7.4	1		07/05/23 13:18		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.58	mg/L	0.25	0.059	1		07/12/23 14:59		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: FIELD BLANK MOD 10-11 Lab ID: 40264568004 Collected: 06/29/23 11:30 Received: 07/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	07/05/23 05:23	07/05/23 19:11	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	07/05/23 05:23	07/05/23 19:11	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	07/05/23 05:23	07/05/23 19:11	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	07/05/23 05:23	07/05/23 19:11		
Zinc	<11.6	ug/L	40.0	11.6	1	07/05/23 05:23	07/05/23 19:11	7440-66-6	
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	07/05/23 06:10	07/07/23 09:34	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	07/05/23 06:10	07/07/23 09:34	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	07/05/23 06:10	07/07/23 09:34	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	07/05/23 06:10	07/07/23 09:34	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	07/05/23 06:10	07/07/23 09:34	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	07/05/23 06:10	07/07/23 09:34	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	07/05/23 06:10	07/07/23 09:34	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	07/05/23 06:10	07/07/23 09:34	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	07/05/23 06:10	07/07/23 09:34	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	07/05/23 06:10	07/07/23 09:34	7439-92-1	
Lithium	0.48J	ug/L	1.0	0.22	1	07/05/23 06:10	07/07/23 09:34	7439-93-2	B
Molybdenum	<0.44	ug/L	1.5	0.44	1	07/05/23 06:10	07/07/23 09:34	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	07/05/23 06:10	07/07/23 09:34	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	07/05/23 06:10	07/07/23 09:34	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	07/11/23 10:42	07/12/23 08:32	7439-97-6	1q
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		07/03/23 14:13		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.7	Std. Units	0.10	0.010	1		07/03/23 13:52		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		07/13/23 06:31	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		07/13/23 06:31	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		07/13/23 06:31	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		07/05/23 13:19		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: FIELD BLANK MOD 10-11 Lab ID: 40264568004 Collected: 06/29/23 11:30 Received: 07/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay								
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		07/12/23 14:59		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	449422	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2581268 Matrix: Water
 Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	07/12/23 08:09	

LABORATORY CONTROL SAMPLE: 2581269

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581270 2581271

Parameter	Units	40264568001 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	5.5	5.2	110	104	85-115	6	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	448947	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2578837 Matrix: Water

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	4.6J	10.0	07/05/23 18:36	
Manganese	ug/L	<1.5	5.0	07/05/23 18:36	
Silver	ug/L	<3.2	10.0	07/05/23 18:36	
Total Hardness by 2340B	mg/L	<1.0	5.4	07/05/23 18:36	
Zinc	ug/L	<11.6	40.0	07/05/23 18:36	

LABORATORY CONTROL SAMPLE: 2578838

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	267	107	80-120	
Manganese	ug/L	250	268	107	80-120	
Silver	ug/L	125	136	109	80-120	
Total Hardness by 2340B	mg/L		71.7			
Zinc	ug/L	250	264	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2578839 2578840

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40264484001 Result	Spike Conc.	Spike Conc.	Result						
Copper	ug/L	218	250	250	497	488	112	108	75-125	2	20
Manganese	ug/L	16.7	250	250	294	288	111	109	75-125	2	20
Silver	ug/L	<3.2	125	125	140	137	110	107	75-125	2	20
Total Hardness by 2340B	mg/L	95400			167	167				0	20
Zinc	ug/L	238	250	250	508	501	108	105	75-125	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	448951	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3010A	Analysis Description:	6020B MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2578857 Matrix: Water

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	07/07/23 08:32	
Arsenic	ug/L	<0.28	1.0	07/07/23 08:32	
Barium	ug/L	<0.70	2.3	07/07/23 08:32	
Beryllium	ug/L	<0.25	1.0	07/07/23 08:32	
Boron	ug/L	<3.0	10.0	07/07/23 08:32	
Cadmium	ug/L	<0.15	1.0	07/07/23 08:32	
Calcium	ug/L	<76.2	254	07/07/23 08:32	
Chromium	ug/L	<1.0	3.4	07/07/23 08:32	
Cobalt	ug/L	<0.12	1.0	07/07/23 08:32	
Lead	ug/L	<0.24	1.0	07/07/23 08:32	
Lithium	ug/L	0.53J	1.0	07/07/23 08:32	
Molybdenum	ug/L	<0.44	1.5	07/07/23 08:32	
Selenium	ug/L	<0.32	1.1	07/07/23 08:32	
Thallium	ug/L	<0.14	1.0	07/07/23 08:32	

LABORATORY CONTROL SAMPLE: 2578858

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	259	104	80-120	
Arsenic	ug/L	250	257	103	80-120	
Barium	ug/L	250	252	101	80-120	
Beryllium	ug/L	250	273	109	80-120	
Boron	ug/L	250	269	107	80-120	
Cadmium	ug/L	250	258	103	80-120	
Calcium	ug/L	10000	10000	100	80-120	
Chromium	ug/L	250	254	101	80-120	
Cobalt	ug/L	250	252	101	80-120	
Lead	ug/L	250	258	103	80-120	
Lithium	ug/L	250	271	109	80-120	
Molybdenum	ug/L	250	255	102	80-120	
Selenium	ug/L	250	270	108	80-120	
Thallium	ug/L	250	250	100	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2578859		2578860		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40264526004 Result	MS Spike Conc.	MSD Spike Conc.									
Antimony	ug/L	<0.00015 mg/L	250	250	261	262	104	105	75-125	0	20		
Arsenic	ug/L	0.00036J mg/L	250	250	261	262	104	105	75-125	1	20		
Barium	ug/L	0.074 mg/L	250	250	327	329	101	102	75-125	1	20		
Beryllium	ug/L	<0.00025 mg/L	250	250	285	288	114	115	75-125	1	20		
Boron	ug/L	0.051 mg/L	250	250	328	337	111	114	75-125	3	20		
Cadmium	ug/L	<0.00015 mg/L	250	250	257	259	103	104	75-125	1	20		
Calcium	ug/L	87.5 mg/L	10000	10000	101000	104000	133	160	75-125	3	20	P6	
Chromium	ug/L	<0.0010 mg/L	250	250	247	250	99	100	75-125	1	20		
Cobalt	ug/L	0.00033J mg/L	250	250	240	243	96	97	75-125	1	20		
Lead	ug/L	<0.00024 mg/L	250	250	251	254	100	102	75-125	1	20		
Lithium	ug/L	0.0045 mg/L	250	250	285	288	112	114	75-125	1	20		
Molybdenum	ug/L	0.0014J mg/L	250	250	263	265	105	105	75-125	0	20		
Selenium	ug/L	0.0010J mg/L	250	250	271	273	108	109	75-125	1	20		
Thallium	ug/L	0.00026J mg/L	250	250	233	236	93	94	75-125	1	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	448880	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2578605 Matrix: Water
 Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	07/03/23 14:10	

LABORATORY CONTROL SAMPLE: 2578606

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	593	590	99	80-120	

SAMPLE DUPLICATE: 2578607

Parameter	Units	40264504001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1520	1490	2	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch: 448888

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

SAMPLE DUPLICATE: 2578712

Parameter	Units	40264445001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.8	8.8	1	20	H6

SAMPLE DUPLICATE: 2578713

Parameter	Units	40264568001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	449550	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: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2582150 Matrix: Water
 Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	07/12/23 20:38	
Fluoride	mg/L	<0.095	0.32	07/12/23 20:38	
Sulfate	mg/L	<0.44	2.0	07/12/23 20:38	

LABORATORY CONTROL SAMPLE: 2582151

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.1	100	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	20.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2582152 2582153

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40264435001 Result	Spike Conc.	Spike Conc.	Conc.								
Chloride	mg/L	30.8	20	20	50.1	50.2	97	97	90-110	0	15		
Fluoride	mg/L	0.17J	2	2	2.2	2.2	100	101	90-110	0	15		
Sulfate	mg/L	5.4	20	20	25.8	25.7	102	102	90-110	0	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2582154 2582155

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40264442002 Result	Spike Conc.	Spike Conc.	Conc.								
Chloride	mg/L	410	400	400	796	788	96	94	90-110	1	15		
Sulfate	mg/L	58.8	400	400	455	451	99	98	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch: 448977	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: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2578944 Matrix: Water
 Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	07/05/23 13:12	

LABORATORY CONTROL SAMPLE: 2578945

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	107	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2578946 2578947

Parameter	Units	40264568001		2578947		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Alkalinity, Total as CaCO3	mg/L	300	100	100	396	397	96	97	90-110	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2578948 2578949

Parameter	Units	40264571005		2578949		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Alkalinity, Total as CaCO3	mg/L	258	100	100	356	357	97	98	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch: 449498

Analysis Method: EPA 353.2

QC Batch Method: EPA 353.2

Analysis Description: 353.2 Nitrate + Nitrite, preserved

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568001

METHOD BLANK: 2581620

Matrix: Water

Associated Lab Samples: 40264568001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	07/12/23 11:26	

LABORATORY CONTROL SAMPLE: 2581621

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581622 2581623

Parameter	Units	40264422002		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	<0.30	12.5	12.5	11.6	11.8	93	94	90-110	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581624 2581625

Parameter	Units	40264442002		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.5	2.3	2.3	94	91	90-110	3	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch:	449499	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40264568002, 40264568003, 40264568004

METHOD BLANK: 2581626 Matrix: Water
 Associated Lab Samples: 40264568002, 40264568003, 40264568004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	07/12/23 14:56	

LABORATORY CONTROL SAMPLE: 2581627

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581628 2581629

Parameter	Units	40264568002		2581629		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	3.1	2.5	5.6	5.6	100	99	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581630 2581631

Parameter	Units	40264797002		2581631		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Nitrogen, NO2 plus NO3	mg/L	1.4	12.5	13.8	13.6	99	98	90-110	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-313 **Lab ID: 40264568001** Collected: 06/29/23 11:50 Received: 07/01/23 09:00 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	-0.132 ± 0.334 (0.731) C:NA T:83%	pCi/L	07/24/23 14:57	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.350 ± 0.381 (0.796) C:84% T:83%	pCi/L	07/14/23 15:05	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.350 ± 0.715 (1.53)	pCi/L	07/25/23 10:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-314 **Lab ID: 40264568002** Collected: 06/29/23 12:40 Received: 07/01/23 09:00 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	0.0476 ± 0.385 (0.755) C:NA T:80%	pCi/L	07/24/23 14:57	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.374 ± 0.395 (0.819) C:83% T:80%	pCi/L	07/14/23 15:06	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.422 ± 0.780 (1.57)	pCi/L	07/25/23 10:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: MW-315 **Lab ID: 40264568003** Collected: 06/29/23 13:20 Received: 07/01/23 09:00 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	-0.117 ± 0.276 (0.619) C:NA T:89%	pCi/L	07/24/23 14:57	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.464 ± 0.345 (0.669) C:78% T:89%	pCi/L	07/14/23 15:06	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.464 ± 0.621 (1.29)	pCi/L	07/25/23 10:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Sample: FIELD BLANK MOD 10-11 **Lab ID:** 40264568004 Collected: 06/29/23 11:30 Received: 07/01/23 09:00 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	-0.0447 ± 0.382 (0.779) C:NA T:84%	pCi/L	07/24/23 14:57	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.414 ± 0.372 (0.755) C:84% T:84%	pCi/L	07/14/23 15:06	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.414 ± 0.754 (1.53)	pCi/L	07/25/23 10:45	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch: 599756

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: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2914973

Matrix: Water

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0247 ± 0.289 (0.673) C:84% T:84%	pCi/L	07/14/23 15:05	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

QC Batch: 599753

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: 40264568001, 40264568002, 40264568003, 40264568004

METHOD BLANK: 2914969

Matrix: Water

Associated Lab Samples: 40264568001, 40264568002, 40264568003, 40264568004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0414 ± 0.189 (0.446) C:NA T:84%	pCi/L	07/24/23 14:57	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALIFIERS

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

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 Analyte was measured in the associated method blank at a concentration of -0.10ug/L

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40264568001	MW-313	EPA 3010A	448947	EPA 6010D	449032
40264568002	MW-314	EPA 3010A	448947	EPA 6010D	449032
40264568003	MW-315	EPA 3010A	448947	EPA 6010D	449032
40264568004	FIELD BLANK MOD 10-11	EPA 3010A	448947	EPA 6010D	449032
40264568001	MW-313	EPA 3010A	448951	EPA 6020B	449017
40264568002	MW-314	EPA 3010A	448951	EPA 6020B	449017
40264568003	MW-315	EPA 3010A	448951	EPA 6020B	449017
40264568004	FIELD BLANK MOD 10-11	EPA 3010A	448951	EPA 6020B	449017
40264568001	MW-313	EPA 7470	449422	EPA 7470	449495
40264568002	MW-314	EPA 7470	449422	EPA 7470	449495
40264568003	MW-315	EPA 7470	449422	EPA 7470	449495
40264568004	FIELD BLANK MOD 10-11	EPA 7470	449422	EPA 7470	449495
40264568001	MW-313				
40264568002	MW-314				
40264568003	MW-315				
40264568001	MW-313	EPA 903.1	599753		
40264568002	MW-314	EPA 903.1	599753		
40264568003	MW-315	EPA 903.1	599753		
40264568004	FIELD BLANK MOD 10-11	EPA 903.1	599753		
40264568001	MW-313	EPA 904.0	599756		
40264568002	MW-314	EPA 904.0	599756		
40264568003	MW-315	EPA 904.0	599756		
40264568004	FIELD BLANK MOD 10-11	EPA 904.0	599756		
40264568001	MW-313	Total Radium Calculation	603892		
40264568002	MW-314	Total Radium Calculation	603892		
40264568003	MW-315	Total Radium Calculation	603892		
40264568004	FIELD BLANK MOD 10-11	Total Radium Calculation	603892		
40264568001	MW-313	SM 2540C	448880		
40264568002	MW-314	SM 2540C	448880		
40264568003	MW-315	SM 2540C	448880		
40264568004	FIELD BLANK MOD 10-11	SM 2540C	448880		
40264568001	MW-313	EPA 9040	448888		
40264568002	MW-314	EPA 9040	448888		
40264568003	MW-315	EPA 9040	448888		
40264568004	FIELD BLANK MOD 10-11	EPA 9040	448888		
40264568001	MW-313	EPA 300.0	449550		
40264568002	MW-314	EPA 300.0	449550		
40264568003	MW-315	EPA 300.0	449550		
40264568004	FIELD BLANK MOD 10-11	EPA 300.0	449550		
40264568001	MW-313	EPA 310.2	448977		
40264568002	MW-314	EPA 310.2	448977		
40264568003	MW-315	EPA 310.2	448977		
40264568004	FIELD BLANK MOD 10-11	EPA 310.2	448977		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 WPL-COLUMBIA

Pace Project No.: 40264568

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40264568001	MW-313	EPA 353.2	449498		
40264568002	MW-314	EPA 353.2	449499		
40264568003	MW-315	EPA 353.2	449499		
40264568004	FIELD BLANK MOD 10-11	EPA 353.2	449499		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40264568

ALL SHADED AREAS are for LAB USE ONLY

Company: SCS Engineers		Billing Information: 25222157	
Address: 2530 Davy Dr, Madison, WI 53718		Email To: mblodgett@scsengineers.com	
Report To: Meghan Blodgett		Site Collection Info/Address: WPL - Columbia	
Copy To:		State: WI County/City: Portage Time Zone Collected: [] PT [] MT [] CT [] ET	
Customer Project Name/Number:		Compliance Monitoring? [] Yes [] No	
Phone: 414-517-0253	Site/Facility ID #:	DW PWS ID #:	
Email: eschoefer@scsengineers.com		DW Location Code:	
Collected By (print): Ethan Schoefer	Purchase Order #:	Immediately Packed on Ice: [] Yes [] No	
Collected By (signature): <i>[Signature]</i>	Quote #:	Field Filtered (if applicable): [] Yes [] No	
Turnaround Date Required:		Analysis: _____	
Sample Disposal: [] Dispose as appropriate [] Return [] Archive [] Hold	Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply)		

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

Container Preservative Type **	
U	U

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

Analyses

TDS, Chloride, Fluoride, Sulfate	pH, alkalinity	Radium 226	Radium 228	metals, hardness	Nitrate + Nitrite
X	X	X	X	X	X

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

LAB USE ONLY: Lab Sample # / Comments:

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns	Analyses															
			Date	Time	Date	Time			TDS	Chloride	Fluoride	Sulfate	pH	alkalinity	Radium 226	Radium 228	metals	hardness	Nitrate + Nitrite					
MW-313	GW	6	6/29	1130			6	X	X	X	X	X	X	X	X	X	X							001
MW-314	GW	6	6/29	1240			6	X	X	X	X	X	X	X	X	X	X							002
MW-315	GW	6	6/29	1320			6	X	X	X	X	X	X	X	X	X	X							003
Field Blank md10-11			6/29	1130			5	X	X	X	X	X	X	X	X	X	X							004

Customer Remarks / Special Conditions / Possible Hazards:	Type of Ice Used: Wet Blue Dry None	SHORT HOLDS PRESENT (<72 hours): Y N N/A
	Packing Material Used: <i>[Signature]</i>	Lab Tracking #: 2839171
	Radchem sample(s) screened (<500 cpm): See	Sample received via: <i>[Signature]</i>
		Carrier: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:	
Temp Blank Received:	Y N NA
Therm ID#:	
Cooler 1 Temp Upon Receipt:	_____ oC
Cooler 1 Therm Corr. Factor:	_____ oC
Cooler 1 Corrected Temp:	_____ oC
Comments:	<i>[Signature]</i> 07/10/2023

Relinquished by/Company: (Signature) <i>[Signature]</i> SCS	Date/Time: 6/30/23 1430	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature) CS Logistics	Date/Time: 07/10/2023 09:00	Received by/Company: (Signature) <i>[Signature]</i> Mutt Vandenberg Pace	Date/Time: 07/10/2023 09:00
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

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

Temp Blank Received: Y N NA	
Therm ID#: _____	
Cooler 1 Temp Upon Receipt: _____ oC	
Cooler 1 Therm Corr. Factor: _____ oC	
Cooler 1 Corrected Temp: _____ oC	
Comments: <i>[Signature]</i> 07/10/2023	
Non Conformance(s):	Page 36 of 39
YES / NO	of: 1

Client Name: SCS Engineers

Sample Preservation Receipt Form
 Project # 40264868

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

Lab Lot# of pH paper: 1000723

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

Initial when completed MJZ Date/Time

Pace Lab #	Glass					Plastic					Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)									
	AG1U	BG1U	AG1H	AG4S	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			
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
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

MJZ
07/01/2023

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	1 liter plastic HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineers

WO#: **40264568**



Courier: CS Logistics Fed Ex Speedee UPS Walto
 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-178 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Un/corr: 0.5 / I/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: 07/01/2023 Initials: MJB

Labeled By Initials: SG

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

Table 2. Sampling Points and Parameters - CCR Baseline Sampling Program
Groundwater Monitoring - Columbia Energy Center / SCS Engineers Project #25223067

Parameter	COC #1 - Background Wells		COC #2 - Landfill Modules 1-3						COC #3 - Landfill Modules 4-6				COC #4 - Landfill Modules 10-11				COC #5		
	MW-301	MW-84A	MW-302	MW-33AR	MW-34A	MW-93A	MW-93B	MW-312	FIELD BLANK - MOD1-3LF	MW-309	MW-310	MW-311	FIELD BLANK MOD4	MW-313	MW-314	MW-315	FIELD BLANK MOD10-11	MW-309	FIELD BLANK MOD4
Appendix III Parameters (Detection Monitoring)	Boron													X	X	X	X	X	X
	Calcium													X	X	X	X		
	Chloride													X	X	X	X		
	Fluoride													X	X	X	X		
	pH													X	X	X	X		
	Sulfate													X	X	X	X	X	X
	TDS													X	X	X	X		
	Antimony														X	X	X	X	
	Arsenic														X	X	X	X	
	Barium														X	X	X	X	
	Beryllium														X	X	X	X	
	Cadmium														X	X	X	X	
	Chromium														X	X	X	X	
Cobalt														X	X	X	X		
Fluoride														X	X	X	X		
Lead														X	X	X	X		
Lithium														X	X	X	X		
Mercury														X	X	X	X		
Molybdenum														X	X	X	X		
Selenium														X	X	X	X		
Thallium														X	X	X	X		
Radium 226+228														X	X	X	X		
Appendix IV Parameters (Assessment Monitoring)	Alkalinity	X	X	X	X	X								X	X	X	X		
	Hardness	X	X	X	X	X								X	X	X	X		
	Nitrate + Nitrite as N	X	X	X	X	X								X	X	X	X		
	Copper	X	X	X	X	X								X	X	X	X		
	Manganese	X	X	X	X	X								X	X	X	X		
	Silver	X	X	X	X	X								X	X	X	X		
	Zinc	X	X	X	X	X								X	X	X	X		
CCR Rule Field Parameters	Groundwater Elevation	X	X	X	X	X								X	X	X	X		
	pH	X	X	X	X	X								X	X	X	X		
	Well Depth																		
	Specific Conductance	X	X	X	X	X								X	X	X	X		
Low-Flow Sampling Field Parameters	Dissolved Oxygen	X	X	X	X	X								X	X	X	X		
	ORP	X	X	X	X	X								X	X	X	X		
	Temperature	X	X	X	X	X								X	X	X	X		
	Turbidity	X	X	X	X	X								X	X	X	X		
	Color	X	X	X	X	X								X	X	X	X		
Odor	X	X	X	X	X								X	X	X	X			

Notes: All samples are unfiltered (total).

X:\reports\40264h\40264568\2306 WDNR Baseline_COL CCR_309 Resample.xls\Sheet1



September 06, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25222157 ALLIANT COLUMBIA
Pace Project No.: 40265991

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on August 01, 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 Burriss, 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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CERTIFICATIONS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE SUMMARY

Project: 25222157 ALLIANT COLUMBIA
Pace Project No.: 40265991

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40265991001	MW-313	Water	07/31/23 10:00	08/01/23 09:00
40265991002	MW-314	Water	07/31/23 10:30	08/01/23 09:00
40265991003	MW-315	Water	07/31/23 11:10	08/01/23 09:00
40265991004	FIELD BLANK	Water	07/31/23 11:00	08/01/23 09:00

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40265991001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	9	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	MT	1	PASI-G
		EPA 353.2	MT	1	PASI-G
		40265991002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS			14	PASI-G
EPA 7470	AJT			1	PASI-G
	LB			9	PASI-G
EPA 903.1	LL1			1	PASI-PA
EPA 904.0	ZPC			1	PASI-PA
Total Radium Calculation	JAL			1	PASI-PA
SM 2540C	SRK			1	PASI-G
EPA 9040	SRK			1	PASI-G
EPA 300.0	HMB			3	PASI-G
EPA 310.2	MT			1	PASI-G
EPA 353.2	MT			1	PASI-G
40265991003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			LB	9	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	MT	1	PASI-G
		EPA 353.2	MT	1	PASI-G
		40265991004	FIELD BLANK	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
		EPA 903.1	LL1	1	PASI-PA
		EPA 904.0	ZPC	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		SM 2540C	SRK	1	PASI-G
		EPA 9040	SRK	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 310.2	MT	1	PASI-G
		EPA 353.2	MT	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-313 Lab ID: 40265991001 Collected: 07/31/23 10:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	08/04/23 06:00	08/04/23 15:08	7440-50-8	
Manganese	47.1	ug/L	5.0	1.5	1	08/04/23 06:00	08/04/23 15:08	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	08/07/23 05:29	08/08/23 11:01	7440-22-4	
Total Hardness by 2340B	376	mg/L	5.4	1.0	1	08/04/23 06:00	08/04/23 15:08		
Zinc	<11.6	ug/L	40.0	11.6	1	08/04/23 06:00	08/04/23 15:08	7440-66-6	
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	08/03/23 05:33	08/05/23 00:32	7440-36-0	
Arsenic	0.34J	ug/L	1.0	0.28	1	08/03/23 05:33	08/05/23 00:32	7440-38-2	
Barium	38.9	ug/L	2.3	0.70	1	08/03/23 05:33	08/05/23 00:32	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	08/03/23 05:33	08/05/23 00:32	7440-41-7	
Boron	97.1	ug/L	10.0	3.0	1	08/03/23 05:33	08/05/23 00:32	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	08/03/23 05:33	08/05/23 00:32	7440-43-9	
Calcium	70000	ug/L	254	76.2	1	08/03/23 05:33	08/05/23 00:32	7440-70-2	
Chromium	1.3J	ug/L	3.4	1.0	1	08/03/23 05:33	08/05/23 00:32	7440-47-3	
Cobalt	0.18J	ug/L	1.0	0.12	1	08/03/23 05:33	08/05/23 00:32	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	08/03/23 05:33	08/05/23 00:32	7439-92-1	
Lithium	0.82J	ug/L	1.0	0.22	1	08/03/23 05:33	08/05/23 00:32	7439-93-2	B
Molybdenum	1.1J	ug/L	1.5	0.44	1	08/03/23 05:33	08/05/23 00:32	7439-98-7	
Selenium	0.64J	ug/L	1.1	0.32	1	08/03/23 05:33	08/05/23 00:32	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	08/03/23 05:33	08/05/23 00:32	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	08/03/23 08:08	08/03/23 15:01	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.40	Std. Units			1		07/31/23 10:00		
Field Specific Conductance	622.8	umhos/cm			1		07/31/23 10:00		
Oxygen, Dissolved	8.16	mg/L			1		07/31/23 10:00	7782-44-7	
REDOX	240.0	mV			1		07/31/23 10:00		
Turbidity	0.00	NTU			1		07/31/23 10:00		
Static Water Level	783.96	feet			1		07/31/23 10:00		
Apparent Color	N	no units			1		07/31/23 10:00		
Odor	N	no units			1		07/31/23 10:00		
Temperature, Water (C)	10.9	deg C			1		07/31/23 10:00		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	354	mg/L	20.0	8.7	1		08/02/23 15:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 09/06/2023 03:42 PM

Page 6 of 34

02/26/2024 - Classification: Internal - ECRM13238614



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-313 Lab ID: 40265991001 Collected: 07/31/23 10:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		08/02/23 13:03		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	27.0	mg/L	2.0	0.43	1		08/08/23 15:26	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/08/23 15:26	16984-48-8	M0
Sulfate	15.4	mg/L	2.0	0.44	1		08/08/23 15:26	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	293	mg/L	25.0	7.4	1		08/09/23 09:24		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	6.9	mg/L	0.25	0.059	1		08/09/23 13:46		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-314 **Lab ID: 40265991002** Collected: 07/31/23 10:30 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	08/04/23 06:00	08/04/23 15:10	7440-50-8	
Manganese	5.0J	ug/L	5.0	1.5	1	08/04/23 06:00	08/04/23 15:10	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	08/07/23 05:29	08/08/23 10:54	7440-22-4	
Total Hardness by 2340B	521	mg/L	5.4	1.0	1	08/04/23 06:00	08/04/23 15:10		
Zinc	<11.6	ug/L	40.0	11.6	1	08/04/23 06:00	08/04/23 15:10	7440-66-6	
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	08/03/23 05:33	08/05/23 01:31	7440-36-0	
Arsenic	0.32J	ug/L	1.0	0.28	1	08/03/23 05:33	08/05/23 01:31	7440-38-2	
Barium	34.9	ug/L	2.3	0.70	1	08/03/23 05:33	08/05/23 01:31	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	08/03/23 05:33	08/05/23 01:31	7440-41-7	
Boron	12.4	ug/L	10.0	3.0	1	08/03/23 05:33	08/05/23 01:31	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	08/03/23 05:33	08/05/23 01:31	7440-43-9	
Calcium	109000	ug/L	254	76.2	1	08/03/23 05:33	08/05/23 01:31	7440-70-2	
Chromium	1.1J	ug/L	3.4	1.0	1	08/03/23 05:33	08/05/23 01:31	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	08/03/23 05:33	08/05/23 01:31	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	08/03/23 05:33	08/05/23 01:31	7439-92-1	
Lithium	0.71J	ug/L	1.0	0.22	1	08/03/23 05:33	08/05/23 01:31	7439-93-2	B
Molybdenum	0.87J	ug/L	1.5	0.44	1	08/03/23 05:33	08/05/23 01:31	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	08/03/23 05:33	08/05/23 01:31	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	08/03/23 05:33	08/05/23 01:31	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	08/03/23 08:08	08/03/23 15:08	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.45	Std. Units			1		07/31/23 10:30		
Field Specific Conductance	862	umhos/cm			1		07/31/23 10:30		
Oxygen, Dissolved	7.65	mg/L			1		07/31/23 10:30	7782-44-7	
REDOX	158.3	mV			1		07/31/23 10:30		
Turbidity	0.70	NTU			1		07/31/23 10:30		
Static Water Level	784.26	feet			1		07/31/23 10:30		
Apparent Color	N	no units			1		07/31/23 10:30		
Odor	N	no units			1		07/31/23 10:30		
Temperature, Water (C)	11.0	deg C			1		07/31/23 10:30		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	464	mg/L	20.0	8.7	1		08/02/23 15:08		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-314 **Lab ID: 40265991002** Collected: 07/31/23 10:30 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
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		08/02/23 13:05		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.0	mg/L	2.0	0.43	1		08/08/23 16:09	16887-00-6	
Fluoride	0.62	mg/L	0.32	0.095	1		08/08/23 16:09	16984-48-8	
Sulfate	3.9	mg/L	2.0	0.44	1		08/08/23 16:09	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	475	mg/L	25.0	7.4	1		08/09/23 09:25		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	6.7	mg/L	0.25	0.059	1		08/09/23 13:47		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-315 **Lab ID: 40265991003** Collected: 07/31/23 11:10 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	08/04/23 06:00	08/04/23 15:16	7440-50-8	
Manganese	54.4	ug/L	5.0	1.5	1	08/04/23 06:00	08/04/23 15:16	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	08/07/23 05:29	08/08/23 11:05	7440-22-4	
Total Hardness by 2340B	558	mg/L	5.4	1.0	1	08/04/23 06:00	08/04/23 15:16		
Zinc	<11.6	ug/L	40.0	11.6	1	08/04/23 06:00	08/04/23 15:16	7440-66-6	
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	08/03/23 05:33	08/05/23 01:46	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	08/03/23 05:33	08/05/23 01:46	7440-38-2	
Barium	50.4	ug/L	2.3	0.70	1	08/03/23 05:33	08/05/23 01:46	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	08/03/23 05:33	08/05/23 01:46	7440-41-7	
Boron	12.3	ug/L	10.0	3.0	1	08/03/23 05:33	08/05/23 01:46	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	08/03/23 05:33	08/05/23 01:46	7440-43-9	
Calcium	121000	ug/L	254	76.2	1	08/03/23 05:33	08/05/23 01:46	7440-70-2	
Chromium	1.4J	ug/L	3.4	1.0	1	08/03/23 05:33	08/05/23 01:46	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	08/03/23 05:33	08/05/23 01:46	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	08/03/23 05:33	08/05/23 01:46	7439-92-1	
Lithium	0.75J	ug/L	1.0	0.22	1	08/03/23 05:33	08/05/23 01:46	7439-93-2	B
Molybdenum	<0.44	ug/L	1.5	0.44	1	08/03/23 05:33	08/05/23 01:46	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	08/03/23 05:33	08/05/23 01:46	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	08/03/23 05:33	08/05/23 01:46	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	08/03/23 08:08	08/03/23 15:10	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	6.97	Std. Units			1		07/31/23 11:10		
Field Specific Conductance	876	umhos/cm			1		07/31/23 11:10		
Oxygen, Dissolved	4.17	mg/L			1		07/31/23 11:10	7782-44-7	
REDOX	233.3	mV			1		07/31/23 11:10		
Turbidity	0.00	NTU			1		07/31/23 11:10		
Static Water Level	784.49	feet			1		07/31/23 11:10		
Apparent Color	N	no units			1		07/31/23 11:10		
Odor	N	no units			1		07/31/23 11:10		
Temperature, Water (C)	11.1	deg C			1		07/31/23 11:10		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	486	mg/L	20.0	8.7	1		08/02/23 15:09		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-315 Lab ID: 40265991003 Collected: 07/31/23 11:10 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.0	Std. Units	0.10	0.010	1		08/02/23 13:06		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.2	mg/L	2.0	0.43	1		08/08/23 16:23	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/08/23 16:23	16984-48-8	
Sulfate	5.2	mg/L	2.0	0.44	1		08/08/23 16:23	14808-79-8	
310.2 Alkalinity									
Analytical Method: EPA 310.2									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	566	mg/L	50.0	14.9	2		08/09/23 09:54		
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.24J	mg/L	0.25	0.059	1		08/09/23 13:48		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: FIELD BLANK Lab ID: 40265991004 Collected: 07/31/23 11:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	08/04/23 06:00	08/04/23 15:17	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	08/04/23 06:00	08/04/23 15:17	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	08/07/23 05:29	08/08/23 11:06	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	08/04/23 06:00	08/04/23 15:17		
Zinc	<11.6	ug/L	40.0	11.6	1	08/04/23 06:00	08/04/23 15:17	7440-66-6	
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	08/03/23 05:33	08/05/23 01:16	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	08/03/23 05:33	08/05/23 01:16	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	08/03/23 05:33	08/05/23 01:16	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	08/03/23 05:33	08/05/23 01:16	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	08/03/23 05:33	08/05/23 01:16	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	08/03/23 05:33	08/05/23 01:16	7440-43-9	
Calcium	<76.2	ug/L	254	76.2	1	08/03/23 05:33	08/05/23 01:16	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	08/03/23 05:33	08/05/23 01:16	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	08/03/23 05:33	08/05/23 01:16	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	08/03/23 05:33	08/05/23 01:16	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	08/03/23 05:33	08/05/23 01:16	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	08/03/23 05:33	08/05/23 01:16	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	08/03/23 05:33	08/05/23 01:16	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	08/03/23 05:33	08/05/23 01:16	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	08/03/23 08:08	08/03/23 15:12	7439-97-6	
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		08/02/23 15:09		
9040 pH									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.3	Std. Units	0.10	0.010	1		08/02/23 13:24		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		08/08/23 16:38	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		08/08/23 16:38	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		08/08/23 16:38	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		08/09/23 09:27		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: FIELD BLANK Lab ID: 40265991004 Collected: 07/31/23 11:00 Received: 08/01/23 09:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		08/09/23 13:48		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451363	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2593250 Matrix: Water
 Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	08/03/23 14:56	

LABORATORY CONTROL SAMPLE: 2593251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2593252 2593253

Parameter	Units	40265991001 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	4.8	4.9	96	97	85-115	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451468	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2593894 Matrix: Water

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	<3.4	10.0	08/04/23 14:53	
Manganese	ug/L	<1.5	5.0	08/04/23 14:53	
Total Hardness by 2340B	mg/L	<1.0	5.4	08/04/23 14:53	
Zinc	ug/L	<11.6	40.0	08/04/23 14:53	

LABORATORY CONTROL SAMPLE: 2593895

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	261	104	80-120	
Manganese	ug/L	250	261	104	80-120	
Total Hardness by 2340B	mg/L		70.2			
Zinc	ug/L	250	260	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2593896 2593897

Parameter	Units	40266124001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result						
Copper	ug/L	12.4	250	270	250	272	103	104	75-125	1	20	
Manganese	ug/L	9.4	250	268	250	271	104	104	75-125	1	20	
Total Hardness by 2340B	mg/L	240000 ug/L		303		312				3	20	
Zinc	ug/L	<11.6	250	264	250	266	102	103	75-125	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451360	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3010A	Analysis Description:	6020B MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2593233 Matrix: Water

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	08/04/23 23:48	
Arsenic	ug/L	<0.28	1.0	08/04/23 23:48	
Barium	ug/L	<0.70	2.3	08/04/23 23:48	
Beryllium	ug/L	<0.25	1.0	08/04/23 23:48	
Boron	ug/L	<3.0	10.0	08/04/23 23:48	
Cadmium	ug/L	<0.15	1.0	08/04/23 23:48	
Calcium	ug/L	<76.2	254	08/04/23 23:48	
Chromium	ug/L	<1.0	3.4	08/04/23 23:48	
Cobalt	ug/L	<0.12	1.0	08/04/23 23:48	
Lead	ug/L	<0.24	1.0	08/04/23 23:48	
Lithium	ug/L	0.29J	1.0	08/04/23 23:48	
Molybdenum	ug/L	<0.44	1.5	08/04/23 23:48	
Selenium	ug/L	<0.32	1.1	08/04/23 23:48	
Thallium	ug/L	<0.14	1.0	08/04/23 23:48	

LABORATORY CONTROL SAMPLE: 2593234

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	260	104	80-120	
Arsenic	ug/L	250	256	103	80-120	
Barium	ug/L	250	253	101	80-120	
Beryllium	ug/L	250	245	98	80-120	
Boron	ug/L	250	227	91	80-120	
Cadmium	ug/L	250	251	100	80-120	
Calcium	ug/L	10000	10600	106	80-120	
Chromium	ug/L	250	249	100	80-120	
Cobalt	ug/L	250	259	104	80-120	
Lead	ug/L	250	266	106	80-120	
Lithium	ug/L	250	241	96	80-120	
Molybdenum	ug/L	250	263	105	80-120	
Selenium	ug/L	250	259	104	80-120	
Thallium	ug/L	250	252	101	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Parameter	Units	2593235		2593236		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		40265991001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Antimony	ug/L	<0.15	250	250	258	258	103	103	75-125	0	20		
Arsenic	ug/L	0.34J	250	250	249	249	99	99	75-125	0	20		
Barium	ug/L	38.9	250	250	281	282	97	97	75-125	0	20		
Beryllium	ug/L	<0.25	250	250	231	234	92	94	75-125	1	20		
Boron	ug/L	97.1	250	250	301	308	82	84	75-125	2	20		
Cadmium	ug/L	<0.15	250	250	249	250	100	100	75-125	0	20		
Calcium	ug/L	70000	10000	10000	82000	79900	119	98	75-125	3	20		
Chromium	ug/L	1.3J	250	250	239	237	95	94	75-125	1	20		
Cobalt	ug/L	0.18J	250	250	243	242	97	97	75-125	0	20		
Lead	ug/L	<0.24	250	250	259	260	104	104	75-125	0	20		
Lithium	ug/L	0.82J	250	250	230	230	91	92	75-125	0	20		
Molybdenum	ug/L	1.1J	250	250	258	259	103	103	75-125	0	20		
Selenium	ug/L	0.64J	250	250	256	252	102	101	75-125	1	20		
Thallium	ug/L	<0.14	250	250	250	246	100	99	75-125	2	20		

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451326	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2593071 Matrix: Water
 Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	08/02/23 15:06	

LABORATORY CONTROL SAMPLE: 2593072

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	531	576	108	80-120	

SAMPLE DUPLICATE: 2593073

Parameter	Units	40266010001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	898	922	3	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

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch: 451276

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

SAMPLE DUPLICATE: 2592736

Parameter	Units	40265765003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.2	8.2	0	20	1q,H6

SAMPLE DUPLICATE: 2592737

Parameter	Units	40265991001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.5	7.6	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451751	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: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2595846 Matrix: Water
 Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	08/08/23 14:38	
Fluoride	mg/L	<0.095	0.32	08/08/23 14:38	
Sulfate	mg/L	<0.44	2.0	08/08/23 14:38	

LABORATORY CONTROL SAMPLE: 2595847

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.2	106	90-110	
Fluoride	mg/L	2	2.1	104	90-110	
Sulfate	mg/L	20	21.1	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2595848 2595849

Parameter	Units	40265991001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	27.0	20	20	47.8	48.0	104	105	90-110	1	15		
Fluoride	mg/L	<0.095	2	2	2.4	2.4	119	120	90-110	2	15	M0	
Sulfate	mg/L	15.4	20	20	37.0	37.3	108	109	90-110	1	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2595850 2595851

Parameter	Units	40266070001		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	182	400	400	616	616	109	109	90-110	0	15		
Fluoride	mg/L	<1.9	40	40	43.3	43.5	108	109	90-110	1	15		
Sulfate	mg/L	181	400	400	616	616	109	109	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451867	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: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2596348 Matrix: Water
 Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.4	25.0	08/09/23 09:11	

LABORATORY CONTROL SAMPLE: 2596349

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	100	106	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2596350 2596351

Parameter	Units	40265768004 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	220	100	100	311	310	91	90	90-110	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2596352 2596353

Parameter	Units	40266033001 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	75.5	100	100	185	183	109	108	90-110	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch:	451915	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2596513 Matrix: Water
 Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	08/09/23 13:41	

LABORATORY CONTROL SAMPLE: 2596514

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2596515 2596516

Parameter	Units	2596515		2596516		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		40266132001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Nitrogen, NO2 plus NO3	mg/L	3.5	2.5	2.5	6.0	6.0	99	99	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-313	Lab ID: 40265991001	Collected: 07/31/23 10:00	Received: 08/01/23 09:00	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	0.273 ± 0.628 (1.14) C:NA T:88%	pCi/L	08/22/23 13:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.621 ± 0.451 (0.886) C:78% T:89%	pCi/L	08/21/23 16:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.894 ± 1.08 (2.03)	pCi/L	08/23/23 11:43	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-314	Lab ID: 40265991002	Collected: 07/31/23 10:30	Received: 08/01/23 09:00	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	-0.0704 ± 0.321 (0.758) C:NA T:85%	pCi/L	08/22/23 13:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.359 ± 0.390 (0.816) C:81% T:87%	pCi/L	08/21/23 16:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.359 ± 0.711 (1.57)	pCi/L	08/23/23 11:43	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Sample: MW-315	Lab ID: 40265991003	Collected: 07/31/23 11:10	Received: 08/01/23 09:00	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	0.334 ± 0.535 (0.926) C:NA T:94%	pCi/L	08/22/23 13:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	1.02 ± 0.513 (0.898) C:72% T:85%	pCi/L	08/21/23 16:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	1.35 ± 1.05 (1.82)	pCi/L	08/23/23 11:43	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: FIELD BLANK Lab ID: 40265991004 Collected: 07/31/23 11:00 Received: 08/01/23 09:00 Matrix: Water PWS: Site ID: Sample Type:						
	Pace Analytical Services - Greensburg					
Radium-226	EPA 903.1	0.335 ± 0.574 (1.01) C:NA T:84%	pCi/L	08/22/23 13:00	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.510 ± 0.499 (1.03) C:74% T:79%	pCi/L	08/21/23 16:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.845 ± 1.07 (2.04)	pCi/L	08/23/23 11:43	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch: 606959

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: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2952337

Matrix: Water

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.218 ± 0.339 (0.587) C:NA T:87%	pCi/L	08/22/23 12:46	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

QC Batch: 606960

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: 40265991001, 40265991002, 40265991003, 40265991004

METHOD BLANK: 2952341

Matrix: Water

Associated Lab Samples: 40265991001, 40265991002, 40265991003, 40265991004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0807 ± 0.374 (0.853) C:78% T:78%	pCi/L	08/21/23 16:38	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALIFIERS

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

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.

WORKORDER QUALIFIERS

WO: 40265991

[1] Revised Report: The client has provided new groundwater elevation data.

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.

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40265991001	MW-313	EPA 3010A	451468	EPA 6010D	451530
40265991001	MW-313	EPA 3010A	451596	EPA 6010D	451768
40265991002	MW-314	EPA 3010A	451468	EPA 6010D	451530
40265991002	MW-314	EPA 3010A	451596	EPA 6010D	451768
40265991003	MW-315	EPA 3010A	451468	EPA 6010D	451530
40265991003	MW-315	EPA 3010A	451596	EPA 6010D	451768
40265991004	FIELD BLANK	EPA 3010A	451468	EPA 6010D	451530
40265991004	FIELD BLANK	EPA 3010A	451596	EPA 6010D	451768
40265991001	MW-313	EPA 3010A	451360	EPA 6020B	451438
40265991002	MW-314	EPA 3010A	451360	EPA 6020B	451438
40265991003	MW-315	EPA 3010A	451360	EPA 6020B	451438
40265991004	FIELD BLANK	EPA 3010A	451360	EPA 6020B	451438
40265991001	MW-313	EPA 7470	451363	EPA 7470	451414
40265991002	MW-314	EPA 7470	451363	EPA 7470	451414
40265991003	MW-315	EPA 7470	451363	EPA 7470	451414
40265991004	FIELD BLANK	EPA 7470	451363	EPA 7470	451414
40265991001	MW-313				
40265991002	MW-314				
40265991003	MW-315				
40265991001	MW-313	EPA 903.1	606959		
40265991002	MW-314	EPA 903.1	606959		
40265991003	MW-315	EPA 903.1	606959		
40265991004	FIELD BLANK	EPA 903.1	606959		
40265991001	MW-313	EPA 904.0	606960		
40265991002	MW-314	EPA 904.0	606960		
40265991003	MW-315	EPA 904.0	606960		
40265991004	FIELD BLANK	EPA 904.0	606960		
40265991001	MW-313	Total Radium Calculation	610583		
40265991002	MW-314	Total Radium Calculation	610583		
40265991003	MW-315	Total Radium Calculation	610583		
40265991004	FIELD BLANK	Total Radium Calculation	610583		
40265991001	MW-313	SM 2540C	451326		
40265991002	MW-314	SM 2540C	451326		
40265991003	MW-315	SM 2540C	451326		
40265991004	FIELD BLANK	SM 2540C	451326		
40265991001	MW-313	EPA 9040	451276		
40265991002	MW-314	EPA 9040	451276		
40265991003	MW-315	EPA 9040	451276		
40265991004	FIELD BLANK	EPA 9040	451276		
40265991001	MW-313	EPA 300.0	451751		
40265991002	MW-314	EPA 300.0	451751		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25222157 ALLIANT COLUMBIA

Pace Project No.: 40265991

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40265991003	MW-315	EPA 300.0	451751		
40265991004	FIELD BLANK	EPA 300.0	451751		
40265991001	MW-313	EPA 310.2	451867		
40265991002	MW-314	EPA 310.2	451867		
40265991003	MW-315	EPA 310.2	451867		
40265991004	FIELD BLANK	EPA 310.2	451867		
40265991001	MW-313	EPA 353.2	451915		
40265991002	MW-314	EPA 353.2	451915		
40265991003	MW-315	EPA 353.2	451915		
40265991004	FIELD BLANK	EPA 353.2	451915		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



CHAIN-OF-CUSTODY Analytical Request Document

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

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

40265991

ALL SHADED AREAS are for LAB USE ONLY

Company: **SCS Engineers**

Billing Information: **25222157**

Address: **Madison, WI**

Report To: **Meghan Bradgett**

Email To: **mbradgett@scsengineers.com**

Copy To:

Site Collection Info/Address:

Customer Project Name/Number:

State: County/City: Time Zone Collected: [] PT [] MT [] CT [] ET

Phone: **414-897-4253**
Email: **eschaefer@scsengineers.com**

Site/Facility ID #: Compliance Monitoring? [] Yes [] No

Collected By (print): **Ethan Schaefer**

Purchase Order #: Quote #:

Collected By (signature): *[Signature]*

Turnaround Date Required: Immediately Packed on Ice: [] Yes [] No

Sample Disposal: [] Dispose as appropriate [] Return [] Archive [] Hold

Rush: [] Same Day [] Next Day [] 2 Day [] 3 Day [] 4 Day [] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [] Yes [] No
Analysis:

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

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start)		Composite End		Res Cl	# of Ctns
			Date	Time	Date	Time		
MW-313	GW	G	7/31	1000				6
MW-314	GW	G	7/31	1030				6
MW-315	GW	G	7/31	1110				6
Field Blank Mad10-11		G	7/31	1100				0

Analyses	
TDS, Chloride, Fluoride, Sulfate	X
PH, alkalinity	X
Radium 226	X
Radium 228	X
Metals, Hardness	X
Nitrate + Nitrite	X

Lab Profile/Line:

Lab Sample Receipt Checklist:

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

LAB USE ONLY: Lab Sample # / Comments:

08/10/2023
001
002
003
004

Customer Remarks / Special Conditions / Possible Hazards: Type of Ice Used: Wet Blue Dry None
Packing Material Used: **MOIST**
Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A
Lab Tracking #: **2891252**
Samples received via: **08/10/2023**
FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature info:
Temp Blank Received: Y N NA
Therm ID#: _____
Cooler 1 Temp Upon Receipt: _____ °C
Cooler 1 Therm Corr. Factor: _____ °C
Cooler 1 Corrected Temp: _____ °C
Comments:

Relinquished by/Company: (Signature) *[Signature]* SCS
Relinquished by/Company: (Signature) **CS LOGISTICS**
Relinquished by/Company: (Signature)

Date/Time: **7/31/23 1345**
Received by/Company: (Signature) _____
Date/Time: **08/10/2023 09:00**
Received by/Company: (Signature) **Matthew Sambaluk Pace**
Date/Time: _____
Received by/Company: (Signature)

Date/Time: _____
Received by/Company: (Signature) _____
Date/Time: _____
Received by/Company: (Signature) _____

MTJL LAB USE ONLY
Table #: _____
Acctnum: _____
Template: _____
Prelogin: _____
PM: _____
PB: _____
Temp Blank Received: Y N NA
TEL MeOH TSP Other
Non Conformance(s): YES / NO
Page 32 of 34
of: **1**

Client Name: SCS Engineers

Sample Preservation Receipt Form
Project # 40265991

All containers needing preservation have been checked and noted below:

Yes No N/A

Initial when completed: MVA Date/Time:

Lab Lot# of pH paper: 1052723

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

Pace Lab #	Glass						Plastic						Vials					Jars				General		VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)						
	AG1U	BG1U	AG1H	AG4S	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	BP2Z	VG9C	DG9T	VG9U	VG9H	VG9M	VG9D	JG9U	JG9U	WG9U	WPFU								SP5T	ZPLC	GN 1	GN 2		
001								N																	N			X								2.5/5
002								N																		N			X							2.5/5
003								N																		N			X							2.5/5
004								N																		N			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

MVA
08/01/2023

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	JG9U	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	WG9U	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 liter clear plastic HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineers

WO#: **40265991**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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-105 Type of Ice: Wet Blue Dry None Meltwater Only

Cooler Temperature Uncorr: 0.5 /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: 08/10/2023 Initials: MJD

Labeled By Initials: NR

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



September 26, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223067 COLUMBIA BASELINE MOD
Pace Project No.: 40267530

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on September 01, 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



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



CERTIFICATIONS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE SUMMARY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40267530001	MW-313	Water	08/31/23 11:05	09/01/23 08:40
40267530002	MW-314	Water	08/31/23 10:05	09/01/23 08:40
40267530003	MW-315	Water	08/31/23 11:10	09/01/23 08:40
40267530004	FIELD BLANK	Water	08/31/23 11:30	09/01/23 08:40

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40267530001	MW-313	EPA 6010D	SIS	5	PASI-G
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	YER	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	MAR1	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	EXM	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 353.2	MT	1	PASI-G
		40267530002	MW-314	EPA 6010D	SIS
EPA 6020B	KXS			14	PASI-G
EPA 7470	YER			1	PASI-G
	LB			7	PASI-G
EPA 903.1	MAR1			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	EXM			1	PASI-G
SM 4500-H+B	HML			1	PASI-G
EPA 300.0	HMB			3	PASI-G
EPA 353.2	MT			1	PASI-G
40267530003	MW-315			EPA 6010D	SIS
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	YER	1	PASI-G
			LB	7	PASI-G
		EPA 903.1	MAR1	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	EXM	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 353.2	MT	1	PASI-G
		40267530004	FIELD BLANK	EPA 6010D	SIS

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



SAMPLE ANALYTE COUNT

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	KXS	14	PASI-G
		EPA 7470	YER	1	PASI-G
		EPA 903.1	MAR1	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	EXM	1	PASI-G
		SM 4500-H+B	HML	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		EPA 353.2	MT	1	PASI-G

PASI-G = Pace Analytical Services - Green Bay

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-313 Lab ID: 40267530001 Collected: 08/31/23 11:05 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	09/08/23 06:23	09/08/23 14:56	7440-50-8	
Manganese	28.7	ug/L	5.0	1.5	1	09/08/23 06:23	09/08/23 14:56	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	09/08/23 06:23	09/08/23 14:56	7440-22-4	
Total Hardness by 2340B	372	mg/L	5.4	1.0	1	09/08/23 06:23	09/08/23 14:56		
Zinc	<11.6	ug/L	40.0	11.6	1	09/08/23 06:23	09/08/23 14:56	7440-66-6	
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	09/06/23 05:41	09/07/23 20:03	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	09/06/23 05:41	09/07/23 20:03	7440-38-2	
Barium	36.7	ug/L	2.3	0.70	1	09/06/23 05:41	09/07/23 20:03	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	09/06/23 05:41	09/07/23 20:03	7440-41-7	
Boron	62.3	ug/L	10.0	3.0	1	09/06/23 05:41	09/07/23 20:03	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	09/06/23 05:41	09/07/23 20:03	7440-43-9	
Calcium	68600	ug/L	254	76.2	1	09/06/23 05:41	09/07/23 20:03	7440-70-2	
Chromium	1.3J	ug/L	3.4	1.0	1	09/06/23 05:41	09/07/23 20:03	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	09/06/23 05:41	09/07/23 20:03	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	09/06/23 05:41	09/07/23 20:03	7439-92-1	
Lithium	0.75J	ug/L	1.0	0.22	1	09/06/23 05:41	09/07/23 20:03	7439-93-2	B
Molybdenum	0.63J	ug/L	1.5	0.44	1	09/06/23 05:41	09/07/23 20:03	7439-98-7	
Selenium	0.74J	ug/L	1.1	0.32	1	09/06/23 05:41	09/07/23 20:03	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	09/06/23 05:41	09/07/23 20:03	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	09/05/23 10:10	09/06/23 06:06	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.25	Std. Units			1		08/31/23 11:05		
Field Specific Conductance	657.8	umhos/cm			1		08/31/23 11:05		
Oxygen, Dissolved	9.50	mg/L			1		08/31/23 11:05	7782-44-7	
REDOX	151.5	mV			1		08/31/23 11:05		
Turbidity	0.00	NTU			1		08/31/23 11:05		
Static Water Level	783.55	feet			1		08/31/23 11:05		
Temperature, Water (C)	11.2	deg C			1		08/31/23 11:05		
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	278	mg/L	10.0	5.0	1		09/06/23 00:45		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	354	mg/L	20.0	8.7	1		09/06/23 10:29		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Date: 09/26/2023 08:59 AM

Page 6 of 35

02/26/2024 - Classification: Internal - ECRM13238614



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-313 Lab ID: 40267530001 Collected: 08/31/23 11:05 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.3	Std. Units	0.10	0.010	1		09/01/23 18:46		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	34.3	mg/L	2.0	0.43	1		09/08/23 17:21	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		09/08/23 17:21	16984-48-8	
Sulfate	12.7	mg/L	2.0	0.44	1		09/08/23 17:21	14808-79-8	
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	6.5	mg/L	0.25	0.059	1		09/11/23 12:53		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-314 Lab ID: 40267530002 Collected: 08/31/23 10:05 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	09/08/23 06:23	09/08/23 15:00	7440-50-8	
Manganese	13.2	ug/L	5.0	1.5	1	09/08/23 06:23	09/08/23 15:00	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	09/08/23 06:23	09/08/23 15:00	7440-22-4	
Total Hardness by 2340B	533	mg/L	5.4	1.0	1	09/08/23 06:23	09/08/23 15:00		
Zinc	<11.6	ug/L	40.0	11.6	1	09/08/23 06:23	09/08/23 15:00	7440-66-6	
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	09/06/23 05:41	09/07/23 20:10	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	09/06/23 05:41	09/07/23 20:10	7440-38-2	
Barium	33.2	ug/L	2.3	0.70	1	09/06/23 05:41	09/07/23 20:10	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	09/06/23 05:41	09/07/23 20:10	7440-41-7	
Boron	13.0	ug/L	10.0	3.0	1	09/06/23 05:41	09/07/23 20:10	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	09/06/23 05:41	09/07/23 20:10	7440-43-9	
Calcium	109000	ug/L	254	76.2	1	09/06/23 05:41	09/07/23 20:10	7440-70-2	
Chromium	1.1J	ug/L	3.4	1.0	1	09/06/23 05:41	09/07/23 20:10	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	09/06/23 05:41	09/07/23 20:10	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	09/06/23 05:41	09/07/23 20:10	7439-92-1	
Lithium	0.66J	ug/L	1.0	0.22	1	09/06/23 05:41	09/07/23 20:10	7439-93-2	B
Molybdenum	0.77J	ug/L	1.5	0.44	1	09/06/23 05:41	09/07/23 20:10	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	09/06/23 05:41	09/07/23 20:10	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	09/06/23 05:41	09/07/23 20:10	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	09/05/23 10:10	09/06/23 06:08	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	7.12	Std. Units			1		08/31/23 10:05		
Field Specific Conductance	839	umhos/cm			1		08/31/23 10:05		
Oxygen, Dissolved	9.39	mg/L			1		08/31/23 10:05	7782-44-7	
REDOX	294.6	mV			1		08/31/23 10:05		
Turbidity	1.19	NTU			1		08/31/23 10:05		
Static Water Level	783.83	feet			1		08/31/23 10:05		
Temperature, Water (C)	11.3	deg C			1		08/31/23 10:05		
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	468	mg/L	10.0	5.0	1		09/06/23 00:53		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	464	mg/L	20.0	8.7	1		09/06/23 10:29		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-314 Lab ID: 40267530002 Collected: 08/31/23 10:05 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.6	Std. Units	0.10	0.010	1		09/01/23 19:00		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.1	mg/L	2.0	0.43	1		09/08/23 18:48	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		09/08/23 18:48	16984-48-8	
Sulfate	4.0	mg/L	2.0	0.44	1		09/08/23 18:48	14808-79-8	
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	8.1	mg/L	0.25	0.059	1		09/11/23 12:53		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-315 Lab ID: 40267530003 Collected: 08/31/23 11:10 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	09/08/23 06:23	09/08/23 15:02	7440-50-8	
Manganese	37.8	ug/L	5.0	1.5	1	09/08/23 06:23	09/08/23 15:02	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	09/08/23 06:23	09/08/23 15:02	7440-22-4	
Total Hardness by 2340B	594	mg/L	5.4	1.0	1	09/08/23 06:23	09/08/23 15:02		
Zinc	<11.6	ug/L	40.0	11.6	1	09/08/23 06:23	09/08/23 15:02	7440-66-6	
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	09/06/23 05:41	09/07/23 20:18	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	09/06/23 05:41	09/07/23 20:18	7440-38-2	
Barium	48.5	ug/L	2.3	0.70	1	09/06/23 05:41	09/07/23 20:18	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	09/06/23 05:41	09/07/23 20:18	7440-41-7	
Boron	12.6	ug/L	10.0	3.0	1	09/06/23 05:41	09/07/23 20:18	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	09/06/23 05:41	09/07/23 20:18	7440-43-9	
Calcium	125000	ug/L	254	76.2	1	09/06/23 05:41	09/07/23 20:18	7440-70-2	
Chromium	1.6J	ug/L	3.4	1.0	1	09/06/23 05:41	09/07/23 20:18	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	09/06/23 05:41	09/07/23 20:18	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	09/06/23 05:41	09/07/23 20:18	7439-92-1	
Lithium	0.90J	ug/L	1.0	0.22	1	09/06/23 05:41	09/07/23 20:18	7439-93-2	B
Molybdenum	<0.44	ug/L	1.5	0.44	1	09/06/23 05:41	09/07/23 20:18	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	09/06/23 05:41	09/07/23 20:18	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	09/06/23 05:41	09/07/23 20:18	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	09/05/23 10:10	09/06/23 06:10	7439-97-6	
Field Data									
Analytical Method:									
Pace Analytical Services - Green Bay									
Field pH	6.91	Std. Units			1		08/31/23 11:10		
Field Specific Conductance	926	umhos/cm			1		08/31/23 11:10		
Oxygen, Dissolved	4.62	mg/L			1		08/31/23 11:10	7782-44-7	
REDOX	279.3	mV			1		08/31/23 11:10		
Turbidity	2.38	NTU			1		08/31/23 11:10		
Static Water Level	783.97	feet			1		08/31/23 11:10		
Temperature, Water (C)	11.4	deg C			1		08/31/23 11:10		
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	565	mg/L	10.0	5.0	1		09/06/23 01:03		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	526	mg/L	20.0	8.7	1		09/06/23 10:29		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-315 Lab ID: 40267530003 Collected: 08/31/23 11:10 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	8.5	Std. Units	0.10	0.010	1		09/01/23 19:14		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	3.1	mg/L	2.0	0.43	1		09/08/23 19:02	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		09/08/23 19:02	16984-48-8	
Sulfate	4.3	mg/L	2.0	0.44	1		09/08/23 19:02	14808-79-8	
353.2 Nitrogen, NO2/NO3 pres.									
Analytical Method: EPA 353.2									
Pace Analytical Services - Green Bay									
Nitrogen, NO2 plus NO3	0.17J	mg/L	0.25	0.059	1		09/11/23 12:54		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: FIELD BLANK **Lab ID: 40267530004** Collected: 08/31/23 11:30 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6010D MET ICP									
Analytical Method: EPA 6010D Preparation Method: EPA 3010A									
Pace Analytical Services - Green Bay									
Copper	<3.4	ug/L	10.0	3.4	1	09/08/23 06:23	09/08/23 15:08	7440-50-8	
Manganese	<1.5	ug/L	5.0	1.5	1	09/08/23 06:23	09/08/23 15:08	7439-96-5	
Silver	<3.2	ug/L	10.0	3.2	1	09/08/23 06:23	09/08/23 15:08	7440-22-4	
Total Hardness by 2340B	<1.0	mg/L	5.4	1.0	1	09/08/23 06:23	09/08/23 15:08		
Zinc	<11.6	ug/L	40.0	11.6	1	09/08/23 06:23	09/08/23 15:08	7440-66-6	
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	09/06/23 05:41	09/07/23 20:25	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	09/06/23 05:41	09/07/23 20:25	7440-38-2	
Barium	<0.70	ug/L	2.3	0.70	1	09/06/23 05:41	09/07/23 20:25	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	09/06/23 05:41	09/07/23 20:25	7440-41-7	
Boron	<3.0	ug/L	10.0	3.0	1	09/06/23 05:41	09/07/23 20:25	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	09/06/23 05:41	09/07/23 20:25	7440-43-9	
Calcium	106J	ug/L	254	76.2	1	09/06/23 05:41	09/07/23 20:25	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	09/06/23 05:41	09/07/23 20:25	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	09/06/23 05:41	09/07/23 20:25	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	09/06/23 05:41	09/07/23 20:25	7439-92-1	
Lithium	<0.22	ug/L	1.0	0.22	1	09/06/23 05:41	09/07/23 20:25	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	09/06/23 05:41	09/07/23 20:25	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	09/06/23 05:41	09/07/23 20:25	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	09/06/23 05:41	09/07/23 20:25	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	09/05/23 10:10	09/06/23 06:12	7439-97-6	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Green Bay									
Alkalinity, Total as CaCO3	<5.0	mg/L	10.0	5.0	1		09/06/23 01:15		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	14.0J	mg/L	20.0	8.7	1		09/06/23 10:29		
4500H+ pH, Electrometric									
Analytical Method: SM 4500-H+B									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	5.7	Std. Units	0.10	0.010	1		09/01/23 19:22		H6
300.0 IC Anions									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		09/08/23 19:16	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		09/08/23 19:16	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		09/08/23 19:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: FIELD BLANK Lab ID: 40267530004 Collected: 08/31/23 11:30 Received: 09/01/23 08:40 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2 Pace Analytical Services - Green Bay								
Nitrogen, NO2 plus NO3	<0.059	mg/L	0.25	0.059	1		09/13/23 13:36		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	453902	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2607249 Matrix: Water
 Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.066	0.20	09/06/23 05:52	

LABORATORY CONTROL SAMPLE: 2607250

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607251 2607252

Parameter	Units	2607251		2607252		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		40267459002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Mercury	ug/L	<0.066	5	5	4.9	5.0	99	100	85-115	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454253	Analysis Method:	EPA 6010D
QC Batch Method:	EPA 3010A	Analysis Description:	6010D MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2608593 Matrix: Water

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Copper	ug/L	<3.4	10.0	09/11/23 14:04	
Manganese	ug/L	<1.5	5.0	09/11/23 14:04	
Silver	ug/L	<3.2	10.0	09/11/23 14:04	
Total Hardness by 2340B	mg/L	<1.0	5.4	09/11/23 14:04	
Zinc	ug/L	<11.6	40.0	09/11/23 14:04	

LABORATORY CONTROL SAMPLE: 2608594

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Copper	ug/L	250	257	103	80-120	
Manganese	ug/L	250	256	103	80-120	
Silver	ug/L	125	126	101	80-120	
Total Hardness by 2340B	mg/L		71.4			
Zinc	ug/L	250	250	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608595 2608596

Parameter	Units	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40267683017 Result	Spike Conc.	Spike Conc.	Conc.								
Copper	ug/L	28.7	250	250	294	289	106	104	75-125	2	20		
Manganese	ug/L	618	250	250	896	880	111	105	75-125	2	20		
Silver	ug/L	<3.2	125	125	132	130	105	104	75-125	1	20		
Total Hardness by 2340B	mg/L	1090000			1180	1160				1	20		
Zinc	ug/L	307	250	250	567	560	104	101	75-125	1	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454008	Analysis Method:	EPA 6020B
QC Batch Method:	EPA 3010A	Analysis Description:	6020B MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2607482 Matrix: Water

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	09/07/23 16:44	
Arsenic	ug/L	<0.28	1.0	09/07/23 16:44	
Barium	ug/L	<0.70	2.3	09/07/23 16:44	
Beryllium	ug/L	<0.25	1.0	09/07/23 16:44	
Boron	ug/L	<3.0	10.0	09/07/23 16:44	
Cadmium	ug/L	<0.15	1.0	09/07/23 16:44	
Calcium	ug/L	<76.2	254	09/07/23 16:44	
Chromium	ug/L	<1.0	3.4	09/07/23 16:44	
Cobalt	ug/L	<0.12	1.0	09/07/23 16:44	
Lead	ug/L	<0.24	1.0	09/07/23 16:44	
Lithium	ug/L	0.30J	1.0	09/07/23 16:44	
Molybdenum	ug/L	<0.44	1.5	09/07/23 16:44	
Selenium	ug/L	<0.32	1.1	09/07/23 16:44	
Thallium	ug/L	<0.14	1.0	09/07/23 16:44	

LABORATORY CONTROL SAMPLE: 2607483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	250	259	103	80-120	
Arsenic	ug/L	250	258	103	80-120	
Barium	ug/L	250	256	103	80-120	
Beryllium	ug/L	250	254	102	80-120	
Boron	ug/L	250	227	91	80-120	
Cadmium	ug/L	250	262	105	80-120	
Calcium	ug/L	10000	9840	98	80-120	
Chromium	ug/L	250	244	98	80-120	
Cobalt	ug/L	250	258	103	80-120	
Lead	ug/L	250	264	106	80-120	
Lithium	ug/L	250	252	101	80-120	
Molybdenum	ug/L	250	257	103	80-120	
Selenium	ug/L	250	273	109	80-120	
Thallium	ug/L	250	258	103	80-120	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Parameter	Units	40267500001		2607484		2607485		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Antimony	ug/L	0.00016J mg/L	250	250	262	253	105	101	75-125	4	20			
Arsenic	ug/L	0.00030J mg/L	250	250	254	249	102	100	75-125	2	20			
Barium	ug/L	0.051 mg/L	250	250	303	290	101	96	75-125	4	20			
Beryllium	ug/L	<0.00025 mg/L	250	250	241	231	96	92	75-125	4	20			
Boron	ug/L	0.043 mg/L	250	250	257	245	86	81	75-125	5	20			
Cadmium	ug/L	<0.00015 mg/L	250	250	256	250	102	100	75-125	2	20			
Calcium	ug/L	74.4 mg/L	10000	10000	86000	83100	117	87	75-125	4	20			
Chromium	ug/L	<0.0010 mg/L	250	250	239	230	95	92	75-125	4	20			
Cobalt	ug/L	<0.00012 mg/L	250	250	247	238	99	95	75-125	4	20			
Lead	ug/L	<0.00024 mg/L	250	250	259	249	104	99	75-125	4	20			
Lithium	ug/L	0.0036 mg/L	250	250	248	238	98	94	75-125	4	20			
Molybdenum	ug/L	0.0013J mg/L	250	250	255	246	101	98	75-125	3	20			
Selenium	ug/L	0.00070J mg/L	250	250	267	263	106	105	75-125	1	20			
Thallium	ug/L	0.00016J mg/L	250	250	258	247	103	99	75-125	4	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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	453997	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2607457 Matrix: Water
 Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<5.0	10.0	09/05/23 21:34	

LABORATORY CONTROL SAMPLE: 2607458

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	200	207	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2607459 2607460

Parameter	Units	2607459		2607460		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40267500001	MS Spike Conc.	MSD Spike Conc.	MS Result						
Alkalinity, Total as CaCO3	mg/L	279	200	200	436	417	79	69	80-120	5	20 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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454034	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2607558 Matrix: Water
 Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	09/06/23 10:28	

LABORATORY CONTROL SAMPLE: 2607559

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	550	544	99	80-120	

SAMPLE DUPLICATE: 2607560

Parameter	Units	40267565001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	690	690	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch: 453849

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: 40267530001, 40267530002, 40267530003, 40267530004

SAMPLE DUPLICATE: 2606996

Parameter	Units	40267512001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.4	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.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454286	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: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2608806 Matrix: Water
 Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	09/08/23 12:19	
Fluoride	mg/L	<0.095	0.32	09/08/23 12:19	
Sulfate	mg/L	<0.44	2.0	09/08/23 12:19	

LABORATORY CONTROL SAMPLE: 2608807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.1	106	90-110	
Fluoride	mg/L	2	2.0	101	90-110	
Sulfate	mg/L	20	21.2	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608808 2608809

Parameter	Units	40267697001		MSD		MSD		% Rec		Max		Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	Limits	RPD	RPD	
Chloride	mg/L	185	200	200	404	413	109	114	90-110	2	15	M0
Fluoride	mg/L	<0.95	20	20	21.0	21.7	102	106	90-110	4	15	
Sulfate	mg/L	140	200	200	357	367	109	114	90-110	3	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608810 2608811

Parameter	Units	40267530001		MSD		MSD		% Rec		Max		Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	Limits	RPD	RPD	
Chloride	mg/L	34.3	20	20	54.3	54.6	100	102	90-110	1	15	
Fluoride	mg/L	<0.095	2	2	2.1	2.1	107	107	90-110	0	15	
Sulfate	mg/L	12.7	20	20	34.5	34.7	109	110	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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454133	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
		Laboratory:	Pace Analytical Services - Green Bay
Associated Lab Samples:	40267530001, 40267530002, 40267530003		

METHOD BLANK: 2608060 Matrix: Water
 Associated Lab Samples: 40267530001, 40267530002, 40267530003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	09/11/23 12:36	

LABORATORY CONTROL SAMPLE: 2608061

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608062 2608063

Parameter	Units	2608062		2608063		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40267444008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	1.7	2.5	2.5	4.2	4.2	101	104	90-110	2	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2608064 2608065

Parameter	Units	2608064		2608065		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40267530003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Nitrogen, NO2 plus NO3	mg/L	0.17J	2.5	2.5	2.7	2.8	100	103	90-110	3	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	454584	Analysis Method:	EPA 353.2
QC Batch Method:	EPA 353.2	Analysis Description:	353.2 Nitrate + Nitrite, preserved
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40267530004

METHOD BLANK: 2610754 Matrix: Water

Associated Lab Samples: 40267530004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	<0.059	0.25	09/13/23 13:20	

LABORATORY CONTROL SAMPLE: 2610755

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.6	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610756 2610757

Parameter	Units	40267812020		2610756		2610757		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.5	2.7	2.7	106	107	90-110	1	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2610758 2610759

Parameter	Units	40267812022		2610758		2610759		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result				
Nitrogen, NO2 plus NO3	mg/L	<0.059	2.5	2.5	2.7	2.6	106	104	90-110	2	20

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: MW-313 Lab ID: 40267530001 Collected: 08/31/23 11:05 Received: 09/01/23 08:40 Matrix: Water PWS: Site ID: Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	-0.199 ± 0.390 (0.934) C:NA T:92%	pCi/L	09/18/23 12:28	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.217 ± 0.351 (0.761) C:81% T:85%	pCi/L	09/19/23 14:41	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.217 ± 0.741 (1.70)	pCi/L	09/22/23 13:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-314 **Lab ID: 40267530002** Collected: 08/31/23 10:05 Received: 09/01/23 08:40 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	0.0586 ± 0.414 (0.826) C:NA T:97%	pCi/L	09/18/23 12:28	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	0.312 ± 0.452 (0.973) C:75% T:79%	pCi/L	09/19/23 14:41	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	0.371 ± 0.866 (1.80)	pCi/L	09/22/23 13:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Sample: MW-315 **Lab ID: 40267530003** Collected: 08/31/23 11:10 Received: 09/01/23 08:40 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	0.405 ± 0.546 (0.918) C:NA T:99%	pCi/L	09/18/23 12:28	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.110 ± 0.316 (0.707) C:85% T:100%	pCi/L	09/19/23 14:41	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	0.515 ± 0.862 (1.63)	pCi/L	09/22/23 13:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
 without the written consent of Pace Analytical Services, LLC.



ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Sample: FIELD BLANK Lab ID: 40267530004 Collected: 08/31/23 11:30 Received: 09/01/23 08:40 Matrix: Water PWS: Site ID: Sample Type:						
Pace Analytical Services - Greensburg						
Radium-226	EPA 903.1	0.567 ± 0.569 (0.888) C:NA T:91%	pCi/L	09/18/23 12:28	13982-63-3	
Pace Analytical Services - Greensburg						
Radium-228	EPA 904.0	0.442 ± 0.415 (0.854) C:85% T:86%	pCi/L	09/19/23 14:42	15262-20-1	
Pace Analytical Services - Greensburg						
Total Radium	Total Radium Calculation	1.01 ± 0.984 (1.74)	pCi/L	09/22/23 13:11	7440-14-4	

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch: 613999

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: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2989142

Matrix: Water

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.489 ± 0.367 (0.716) C:81% T:86%	pCi/L	09/19/23 14:39	

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

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL - RADIOCHEMISTRY

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

QC Batch:	613997	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: 40267530001, 40267530002, 40267530003, 40267530004

METHOD BLANK: 2989141 Matrix: Water

Associated Lab Samples: 40267530001, 40267530002, 40267530003, 40267530004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0492 ± 0.255 (0.591) C:NA T:97%	pCi/L	09/18/23 12:14	

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

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALIFIERS

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

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

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

M0 Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA BASELINE MOD

Pace Project No.: 40267530

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40267530001	MW-313	EPA 3010A	454253	EPA 6010D	454316
40267530002	MW-314	EPA 3010A	454253	EPA 6010D	454316
40267530003	MW-315	EPA 3010A	454253	EPA 6010D	454316
40267530004	FIELD BLANK	EPA 3010A	454253	EPA 6010D	454316
40267530001	MW-313	EPA 3010A	454008	EPA 6020B	454074
40267530002	MW-314	EPA 3010A	454008	EPA 6020B	454074
40267530003	MW-315	EPA 3010A	454008	EPA 6020B	454074
40267530004	FIELD BLANK	EPA 3010A	454008	EPA 6020B	454074
40267530001	MW-313	EPA 7470	453902	EPA 7470	453963
40267530002	MW-314	EPA 7470	453902	EPA 7470	453963
40267530003	MW-315	EPA 7470	453902	EPA 7470	453963
40267530004	FIELD BLANK	EPA 7470	453902	EPA 7470	453963
40267530001	MW-313				
40267530002	MW-314				
40267530003	MW-315				
40267530001	MW-313	EPA 903.1	613997		
40267530002	MW-314	EPA 903.1	613997		
40267530003	MW-315	EPA 903.1	613997		
40267530004	FIELD BLANK	EPA 903.1	613997		
40267530001	MW-313	EPA 904.0	613999		
40267530002	MW-314	EPA 904.0	613999		
40267530003	MW-315	EPA 904.0	613999		
40267530004	FIELD BLANK	EPA 904.0	613999		
40267530001	MW-313	Total Radium Calculation	617496		
40267530002	MW-314	Total Radium Calculation	617496		
40267530003	MW-315	Total Radium Calculation	617496		
40267530004	FIELD BLANK	Total Radium Calculation	617496		
40267530001	MW-313	SM 2320B	453997		
40267530002	MW-314	SM 2320B	453997		
40267530003	MW-315	SM 2320B	453997		
40267530004	FIELD BLANK	SM 2320B	453997		
40267530001	MW-313	SM 2540C	454034		
40267530002	MW-314	SM 2540C	454034		
40267530003	MW-315	SM 2540C	454034		
40267530004	FIELD BLANK	SM 2540C	454034		
40267530001	MW-313	SM 4500-H+B	453849		
40267530002	MW-314	SM 4500-H+B	453849		
40267530003	MW-315	SM 4500-H+B	453849		
40267530004	FIELD BLANK	SM 4500-H+B	453849		
40267530001	MW-313	EPA 300.0	454286		
40267530002	MW-314	EPA 300.0	454286		
40267530003	MW-315	EPA 300.0	454286		
40267530004	FIELD BLANK	EPA 300.0	454286		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223067 COLUMBIA BASELINE MOD
Pace Project No.: 40267530

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40267530001	MW-313	EPA 353.2	454133		
40267530002	MW-314	EPA 353.2	454133		
40267530003	MW-315	EPA 353.2	454133		
40267530004	FIELD BLANK	EPA 353.2	454584		

REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

Effective Date: 8/16/2022

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # 40267530

All containers needing preservation have been checked and noted below.

Yes No N/A

Initial when completed: EL Date/Time:

Lab Lot# of pH paper 10D2723

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

Pace Lab #	Glass						Plastic						Vials					Jars				General				VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)				
	AG1U	BG1U	AG1H	AG4S	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		
001								2		1	1													2					X							2.5 / 5
002								2		1	1													2					X						2.5 / 5	
003								2		1	1													2					X						2.5 / 5	
004								2		1	1													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

EL
9/1/23

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 liter plastic HNO3
						GN 2	

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: SCS Engineers

WO#: **40267530**

Courier: CS Logistics Fed Ex Speedee UPS Walco
 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-138 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: 9/1/23 /Initials: EL

Labeled By Initials: JG

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



Appendix D

Historical Monitoring Results

Single Location

Name: WPL - Columbia

Location ID: MW-84A		Number of Sampling Dates: 25																								
Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	7/28/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/24/2017	4/25/2018	8/8/2018	10/24/2018	4/3/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023
Boron	ug/L	11.9	14	14.7	--	11.1	14.7	16.1	12.9	14.8	22.9	13.8	25	12.8	10.1	13.6	12	15.7	10	9.7	14.3	11.1	10.5	12.2	10.3	14
Calcium	ug/L	74000	72200	67600	--	74000	76000	70800	73200	76100	74900	77500	76600	76000	74000	80100	73500	72700	77600	69200	69100	75300	75100	78400	68600	65100
Chloride	mg/L	4.9	4.7	5.1	--	4.3	4.7	4.6	4.9	5.5	5.5	5.1	4.8	4.9	4.2	3.6	3.9	3.7	3.7	4.3	4.4	3.5	5.2	3.4	3	3.1
Fluoride	mg/L	<0.2	<0.2	<0.2	--	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	7.6	7.61	7.45	7.34	7.91	7.25	6.99	7.8	7.28	7.23	7.68	7.45	7.38	7.24	7.03	7.23	7.51	7.34	7.49	7.34	7.42	7.34	7.31	7.01	7.51
Sulfate	mg/L	4.9	4.3	3.7	--	2.6	2.7	3	2.8	2.7	2	2.2	2.8	1.9	1.6	1.4	1.3	<2.2	1.5	1.3	1.4	1.3	1.4	1.1	1.3	1.4
Total Dissolved Solids	mg/L	316	322	316	--	324	316	328	342	344	342	314	328	372	330	318	310	316	340	320	328	326	334	302	326	324
Antimony	ug/L	<0.073	0.084	0.1	--	<0.073	<0.073	<0.073	<0.073	<0.15	<0.15	--	<0.15	<0.15	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.55	<0.15	<0.15	<0.15	<0.15	<0.15
Arsenic	ug/L	0.15	0.29	0.14	--	0.35	0.19	0.35	<0.099	<0.28	0.28	--	<0.28	<0.28	0.33	<0.28	0.46	0.38	0.34	0.49	0.91	0.41	0.31	0.72	<0.28	<0.28
Barium	ug/L	15.3	12.7	12.2	--	14.2	18.4	13.8	14.1	13.4	14	--	14.6	13.7	14.5	14.7	13.2	14	13.9	12.6	13.4	12.9	13.5	13.7	12.6	12.7
Beryllium	ug/L	<0.13	<0.13	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18	--	<0.18	<0.18	<0.18	<0.18	<0.25	--	<0.25	<0.25	0.47	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	--	<0.089	<0.089	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	<0.15	<0.15	--	<0.15	<0.15	0.53	<0.15	<0.15	<0.15	<0.15	<0.15
Chromium	ug/L	2.5	1.9	1.8	--	2	2	1.9	2.4	2	1.6	--	2.4	1.5	1.6	1.8	1.6	1.6	1.7	1.6	2.6	1.9	2.2	2.2	1.7	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	<0.12	<0.12	<0.12	0.52	0.12	<0.12	<0.12	<0.12	<0.12
Lead	ug/L	0.16	<0.04	0.39	--	0.049	0.11	<0.04	0.041	<0.2	<0.2	--	<0.2	--	<0.24	<0.24	<0.24	--	<0.24	<0.24	0.55	<0.24	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	0.72	0.44	0.5	--	0.56	0.56	0.56	0.55	0.46	0.58	--	0.5	0.4	0.49	0.56	0.52	0.58	0.4	0.39	1	0.28	0.36	0.41	0.71	0.54
Mercury	ug/L	<0.1	<0.1	<0.13	--	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	<0.07	<0.07	0.073	--	0.12	<0.07	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	0.62	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	<0.21	<0.21	<0.21	--	<0.21	<0.21	<0.21	<0.21	<0.32	<0.32	--	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	0.48	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	--	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.66	0.19	<0.14	<0.14	<0.14	<0.14
Total Radium	pCi/L	0.593	0.0809	--	1.37	0.825	0.404	1.39	0.0929	0.676	0.509	--	0.526	0.529	0.62	0.681	0.247	0.1	0.395	0.39	0.285	0.243	0.611	0.673	0.326	0.844
Radium-226	pCi/L	0.156	-0.088	--	-0.058	0.132	0.168	0.624	0.0768	0.27	0.242	--	0.155	-0.203	0.313	0.199	0.247	0.1	0.368	0	-0.289	0	0.254	0.267	0	0.292
Radium-228	pCi/L	0.437	0.0809	--	1.37	0.693	0.236	0.766	0.0161	0.406	0.267	--	0.371	0.529	0.307	0.482	-0.024	-0.153	0.0273	0.39	0.285	0.243	0.357	0.406	0.326	0.552
Field Specific Conductance	umhos/cm	599	427	574.8	579.3	1002	578.2	489	948	535.3	557.2	491	581.7	617.1	609	637.2	614.1	618.4	613.7	610.1	610.9	598.9	600.2	585.2	556.6	599.9
Oxygen, Dissolved	mg/L	9.7	9.37	3.78	5.11	9.61	8.94	6.48	9.28	9.46	7.5	9.3	3.94	8.84	10.01	9.49	11.36	8.43	9.81	9.39	9.8	9.25	9.33	8.31	9.37	8.44
Field Oxidation Potential	mV	154	165.1	139.9	138.3	82.7	87	192.9	102	123.6	204.7	210	53.3	142.7	71.5	103.4	181.7	121.5	135	153.2	95.6	89.7	200.6	39.9	103.4	91.2
Groundwater Elevation	feet	785.31	786.3	785.89	785.61	787.22	786.63	786.7	787.16	787.63	786.68	785.32	785.88	786.55	788.32	787.35	787.79	786.5	787.02	786.1	785.84	784.96	785.02	784.57	786.97	784.39
Temperature	deg C	10.4	10.2	11.3	11	11.5	10.8	10.9	10.6	11.3	11.2	11.1	10.2	12	11.6	10.2	11.8	10.3	10.6	11.9	10.2	12.5	9.9	11.7	10.7	12.3
Turbidity	NTU	--	0.86	2.75	0.17	0.3	0.25	0.33	0.04	0.56	0.08	2.93	0.81	0.71	3.79	1.9	2.41	1.23	2.15	0	2.45	3.41	0	0	0.72	0.03
pH at 25 Degrees C	Std. Units	7.5	7.4	7.4	--	7.3	7.4	7.3	7.7	7.6	7.4	7.6	7.6	7.4	7.5	7.4	7.5	7.4	7.6	7.6	7.6	7.8	7.6	7.4	7.6	7.6

Single Location

Name: WPL - Columbia

Location ID: MW-301		Number of Sampling Dates: 24																							
Parameter Name	Units	12/22/2015	4/5/2016	7/8/2016	10/13/2016	12/29/2016	1/25/2017	4/11/2017	6/6/2017	8/8/2017	10/23/2017	4/25/2018	8/8/2018	10/24/2018	4/2/2019	10/9/2019	2/3/2020	5/29/2020	10/8/2020	4/14/2021	10/14/2021	4/13/2022	10/27/2022	4/27/2023	10/11/2023
Boron	ug/L	26.5	25.2	23.6	30.6	32.8	32.6	28.8	21.3	30.6	34.3	24.3	22.8	27.8	26.9	35.9	27.9	21.3	28.8	22.2	31.4	28.7	37.5	20.1	36.2
Calcium	ug/L	126000	115000	108000	118000	129000	124000	120000	111000	108000	87200	112000	105000	101000	126000	114000	113000	112000	93000	117000	67800	97300	62800	120000	52300
Chloride	mg/L	3.7	4	3.5	2.2	2	1.5	2	3.5	5.5	4	2.3	5.2	3.2	0.79	1.7	1.3	2	3.4	1.5	2.7	1.9	2.3	1.5	2.1
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095
Field pH	Std. Units	6.85	7.01	6.87	7.28	6.63	7.1	7.11	6.7	6.75	7.37	6.76	6.91	6.79	6.62	6.67	6.89	6.73	6.95	6.66	7.01	6.6	6.8	6.65	7.06
Sulfate	mg/L	9.3	15.3	15	13.9	12.3	6.5	10.3	17.1	31.6	27.5	8.6	21.6	19.2	4.4	8.4	7.2	11.5	25.1	8.5	17.4	12.7	11.6	12.3	11.8
Total Dissolved Solids	mg/L	478	486	464	490	444	514	502	458	462	362	464	502	424	462	418	462	452	412	472	334	422	282	526	300
Antimony	ug/L	0.15	0.094	0.13	<0.073	0.4	<0.073	<0.073	<0.15	<0.15	--	<0.15	0.36	<0.15	0.32	<0.15	--	<0.15	0.33	<0.15	<0.15	0.31	<0.15	<0.15	<0.15
Arsenic	ug/L	0.26	0.26	0.19	0.24	0.4	0.13	0.18	<0.28	<0.28	--	<0.28	0.45	<0.28	0.4	0.42	<0.28	0.33	0.62	<0.28	0.35	0.47	0.3	<0.28	<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	9.8	9.4	8.9	7.7	7.8	7.5	9.8	7.3
Beryllium	ug/L	<0.13	<0.13	<0.13	<0.13	0.19	<0.13	<0.13	<0.18	<0.18	--	<0.18	0.37	<0.18	0.28	<0.25	--	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	0.32	<0.089	<0.089	<0.081	<0.081	--	<0.081	--	<0.15	0.21	<0.15	--	<0.15	0.19	<0.15	<0.15	0.3	<0.15	<0.15	<0.15
Chromium	ug/L	2.1	0.58	0.59	<0.39	0.7	0.53	0.7	2.3	<1	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cobalt	ug/L	1.4	0.25	0.22	0.041	0.38	0.071	0.064	0.13	0.12	--	<0.085	0.28	<0.12	0.35	<0.12	0.17	<0.12	0.29	<0.12	0.34	0.32	0.52	<0.12	0.13
Lead	ug/L	0.9	0.077	0.48	<0.04	0.34	<0.04	<0.04	<0.2	<0.2	--	<0.2	--	<0.24	0.3	<0.24	--	<0.24	0.25	<0.24	<0.24	3.1	<0.24	<0.24	<0.24
Lithium	ug/L	1.3	0.58	0.69	0.6	0.87	0.67	0.68	0.62	0.6	--	0.55	0.85	0.52	0.9	0.61	0.67	0.47	0.46	0.58	0.46	0.56	0.37	0.62	0.43
Mercury	ug/L	<0.1	<0.1	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	--	<0.13	--	<0.084	<0.084	<0.084	--	<0.084	<0.066	<0.066	<0.093	<0.066	<0.066	<0.066	<0.066
Molybdenum	ug/L	0.35	0.15	0.14	0.12	0.38	<0.07	<0.07	<0.44	<0.44	--	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44	<0.44
Selenium	ug/L	0.3	0.21	0.39	<0.21	0.26	<0.21	<0.21	<0.32	<0.32	--	<0.32	0.71	<0.32	0.49	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.48	<0.14	<0.14	<0.14	<0.14	--	<0.14	0.3	<0.14	0.48	<0.14	<0.14	<0.14	0.3	<0.14	0.17	0.32	<0.14	<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	0.193	0.38	1.16	0.172	0.179	0.00292	0.417	0.611
Radium-226	pCi/L	0.655	0.294	0.404	-0.067	0.108	1.46	0.513	0.287	1.09	--	0.122	-0.06	0.247	0	0.252	0.136	0	0.0511	0.418	0.172	0	-0.169	0	-0.0576
Radium-228	pCi/L	0.651	0.82	0.486	0.631	0.905	0.964	0.833	1.01	0.647	--	0.76	0.0351	0.405	0.552	0.449	0.366	0.193	0.329	0.739	-0.0327	0.179	0.00292	0.417	0.611
Field Specific Conductance	umhos/cm	897	573	796	1464	859	1018	1354	698.4	691.7	561	774	799	767	883	801	868	797	760	857	597.2	747	507.5	857	536
Oxygen, Dissolved	mg/L	1.7	2.71	1.47	1.99	1.34	1.24	1.44	1.81	1.43	1.1	2.35	2.14	2.49	2.2	1.67	1.07	2	1.22	3.9	0.25	2.47	0.1	6.5	0.16
Field Oxidation Potential	mV	135	123.7	133.9	100.8	95.8	226.1	100.9	115.1	187.4	204	74.3	126.5	77.9	152.1	173	132.3	118.7	183.9	102.9	57.8	207.5	80.9	95.3	23.8
Groundwater Elevation	feet	785.56	768.12	786.31	787.64	787.37	787.27	787.89	788.25	787.34	785.89	785.29	787.06	788.98	787.04	788.47	787.24	787.77	786.53	786.5	785.28	785.44	784.91	787.57	784.67
Temperature	deg C	9.7	7.7	10	11.2	10.1	8.8	7.7	8.9	10.2	11.1	7.4	10.6	11.1	7.5	11.3	8.5	8.1	11	7.4	11.1	7.1	10.8	8	10.7
Turbidity	NTU	--	1.52	3.89	0.59	0.74	0.42	0.1	0.22	0.18	1.52	1.12	0.46	3.3	2.02	2.12	1.41	0	0	2.41	3.21	0	0	0	0.34
pH at 25 Degrees C	Std. Units	7	7	6.8	6.8	6.9	6.9	7.1	7	7	7.3	7	7	7.1	6.8	7	6.8	7	7.2	6.9	7.3	7	7.1	6.9	7.2

Single Location

Name: WPL - Columbia

Location ID: MW-313										
Number of Sampling Dates: 8										
Parameter Name	Units	1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023	
Boron	ug/L	25.1	46.6	67.1	108	191	189	97.1	62.3	
Calcium	ug/L	66800	62900	63300	63900	69100	71900	70000	68600	
Chloride	mg/L	1.4	<0.43	1.3	2.3	10	22.8	27	34.3	
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095	0.61	0.19	<0.095	<0.095	
Field pH	Std. Units	7.43	7.35	7.4	7.06	7.55	7.41	7.4	7.25	
Sulfate	mg/L	5.7	7.1	8.7	11	16.5	19.9	15.4	12.7	
Total Dissolved Solids	mg/L	298	278	320	318	334	408	354	354	
Antimony	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Arsenic	ug/L	<0.28	0.35	<0.28	<0.28	<0.28	<0.28	0.34	<0.28	
Barium	ug/L	70.5	55.9	47.3	44.3	47.8	47	38.9	36.7	
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	
Cadmium	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Chromium	ug/L	5.2	<1	<1	1.2	1.2	1.4	1.3	1.3	
Cobalt	ug/L	0.4	0.16	<0.12	<0.12	<0.12	<0.12	0.18	<0.12	
Lead	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	
Lithium	ug/L	0.75	0.46	0.46	0.67	0.68	1	0.82	0.75	
Mercury	ug/L	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	
Molybdenum	ug/L	4.3	2	1.4	1.3	1.5	1.3	1.1	0.63	
Selenium	ug/L	0.41	0.55	0.49	0.58	0.59	0.65	0.64	0.74	
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	0.21	<0.14	<0.14	<0.14	
Total Radium	pCi/L	0.345	0.346	0	0.677	0.0341	0.35	0.894	0.217	
Radium-226	pCi/L	-0.326	-0.13	-0.562	0.294	-0.257	-0.132	0.273	-0.199	
Radium-228	pCi/L	0.345	0.346	-0.00854	0.383	0.0341	0.35	0.621	0.217	
Field Specific Conductance	umhos/cm	509.5	557.9	490.5	552.6	520.9	632	622.8	657.8	
Oxygen, Dissolved	mg/L	4.08	5.51	7.03	7.96	7.38	7.17	8.16	9.5	
Field Oxidation Potential	mV	82.6	56.9	51.5	103.2	177	249.4	240	151.5	
Groundwater Elevation	feet	783.36	783.59	784.12	785.21	785.24	784.67	783.96	783.55	
Temperature	deg C	9.4	10	10	10.1	10.4	11.2	10.9	11.2	
Turbidity	NTU	0	1.25	0	1.02	2.52	0	0	0	
pH at 25 Degrees C	Std. Units	7.5	7.4	7.5	7.6	7.5	7.6	7.5	8.3	

Single Location

Name: WPL - Columbia

Location ID: MW-314										
Number of Sampling Dates: 8										
Parameter Name	Units	1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023	
Boron	ug/L	14.2	13	15.2	15.5	16.9	15.4	12.4	13	
Calcium	ug/L	95000	96200	99300	92400	102000	103000	109000	109000	
Chloride	mg/L	1.8	2.2	2.6	3.2	2.3	2.4	3	3.1	
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	0.62	<0.095	
Field pH	Std. Units	7.23	7.23	7.25	7.21	7.34	7.2	7.45	7.12	
Sulfate	mg/L	4.2	4.2	5	4.6	3.4	3.2	3.9	4	
Total Dissolved Solids	mg/L	380	396	412	418	444	470	464	464	
Antimony	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Arsenic	ug/L	<0.28	0.41	<0.28	<0.28	<0.28	<0.28	0.32	<0.28	
Barium	ug/L	48.7	43.4	43.3	42.7	46	41.3	34.9	33.2	
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	
Cadmium	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Chromium	ug/L	<1	1	<1	1.1	<1	<1	1.1	1.1	
Cobalt	ug/L	0.31	0.22	<0.12	<0.12	<0.12	0.14	<0.12	<0.12	
Lead	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	
Lithium	ug/L	0.33	0.58	0.69	0.4	0.34	0.94	0.71	0.66	
Mercury	ug/L	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	<0.066	
Molybdenum	ug/L	1.7	1.4	1.5	1.5	1.7	1.3	0.87	0.77	
Selenium	ug/L	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	<0.32	
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	
Total Radium	pCi/L	0.436	0.247	0.666	0	0.162	0.422	0.359	0.371	
Radium-226	pCi/L	0.436	0.233	-0.164	-0.186	-0.0795	0.0476	-0.0704	0.0586	
Radium-228	pCi/L	-0.00229	0.0135	0.666	-0.0181	0.162	0.374	0.359	0.312	
Field Specific Conductance	umhos/cm	654.9	804	667.3	735	674.5	807	862	839	
Oxygen, Dissolved	mg/L	6.21	5.8	5.51	6.15	6.46	6.53	7.65	9.39	
Field Oxidation Potential	mV	78	125.3	45.6	121.6	167.5	254	158.3	294.6	
Groundwater Elevation	feet	783.63	783.82	784.41	785.43	785.55	784.95	784.26	783.83	
Temperature	deg C	10.3	9.9	10	10	10.4	11	11	11.3	
Turbidity	NTU	7.3	2.62	0	1.8	1.21	0	0.7	1.19	
pH at 25 Degrees C	Std. Units	7.5	7.4	7.2	7.4	7.3	7.3	7.2	8.6	

Single Location

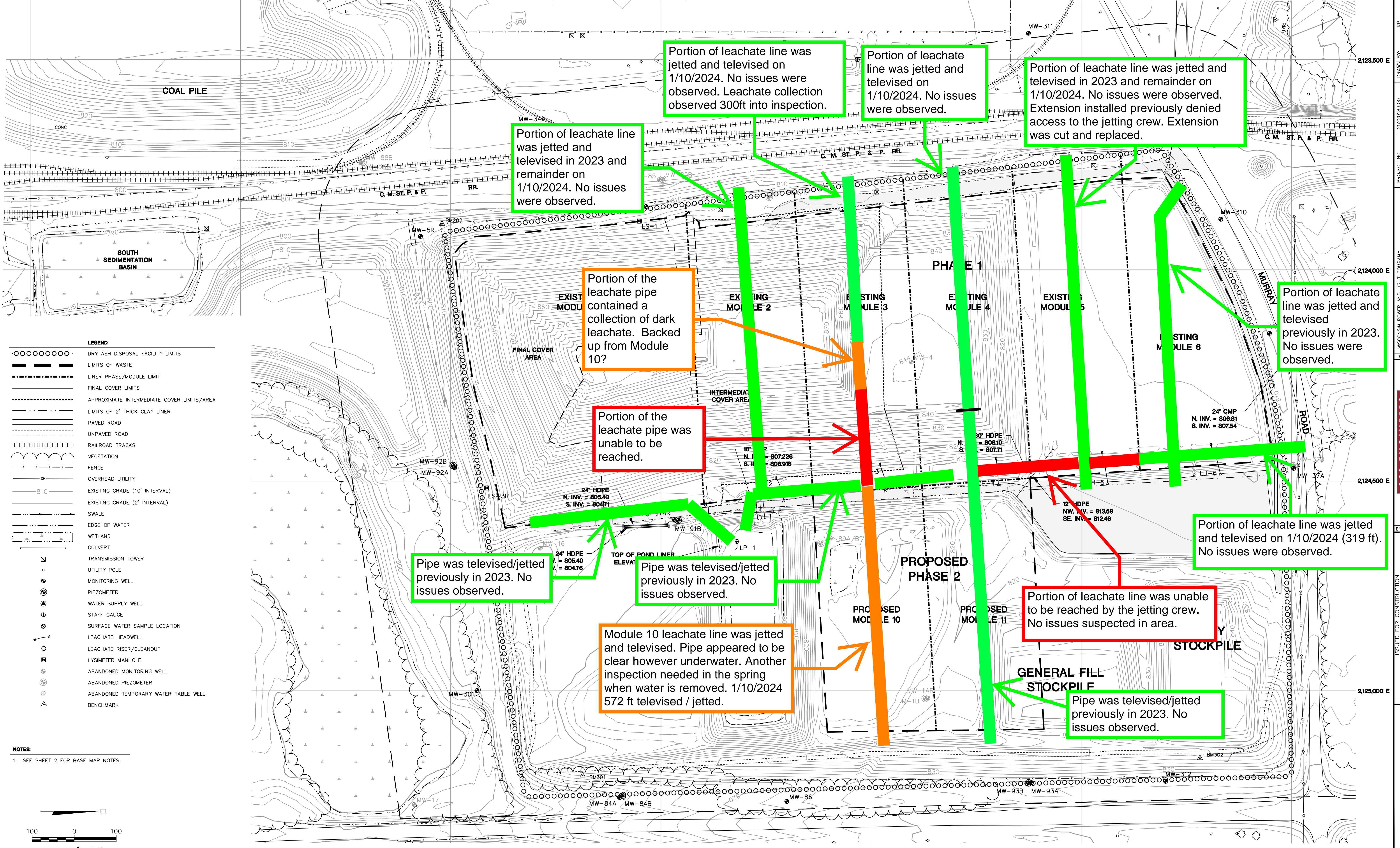
Name: WPL - Columbia

Location ID: MW-315										
Number of Sampling Dates: 8										
Parameter Name	Units	1/24/2023	2/23/2023	3/27/2023	4/26/2023	5/30/2023	6/29/2023	7/31/2023	8/31/2023	
Boron	ug/L	11.7	9.3	11.9	12	13.6	13.3	12.3	12.6	
Calcium	ug/L	107000	100000	106000	101000	108000	110000	121000	125000	
Chloride	mg/L	4.9	5.6	6	5.3	3.9	3.3	3.2	3.1	
Fluoride	mg/L	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	<0.095	
Field pH	Std. Units	7.13	7.16	7.21	7.18	7.34	7.13	6.97	6.91	
Sulfate	mg/L	9.2	8.7	10.7	10.1	8.8	7	5.2	4.3	
Total Dissolved Solids	mg/L	436	448	480	452	456	482	486	526	
Antimony	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Arsenic	ug/L	<0.28	0.49	0.45	0.39	0.37	0.38	<0.28	<0.28	
Barium	ug/L	57.5	46.4	36.6	31.7	47.7	52.7	50.4	48.5	
Beryllium	ug/L	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	
Cadmium	ug/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
Chromium	ug/L	1.2	1.7	1.8	1.9	1.7	1.6	1.4	1.6	
Cobalt	ug/L	0.24	0.12	0.13	<0.12	0.22	0.21	<0.12	<0.12	
Lead	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	0.32	<0.24	<0.24	
Lithium	ug/L	0.62	0.73	0.85	0.8	0.45	1.2	0.75	0.9	
Mercury	ug/L	<0.066	<0.066	<0.066	<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	
Selenium	ug/L	0.4	0.52	0.41	<0.32	0.36	0.58	<0.32	<0.32	
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	
Total Radium	pCi/L	0.351	0.373	0.385	0.257	0.666	0.464	1.35	0.515	
Radium-226	pCi/L	-0.0798	0.149	-0.173	-0.174	-0.0827	-0.117	0.334	0.405	
Radium-228	pCi/L	0.351	0.224	0.385	0.257	0.666	0.464	1.02	0.11	
Field Specific Conductance	umhos/cm	748	892	711	776	716	834	876	926	
Oxygen, Dissolved	mg/L	7.65	7.28	7.83	8.46	7.02	5.4	4.17	4.62	
Field Oxidation Potential	mV	38.4	118.2	45.8	123.4	116	230.7	233.3	279.3	
Groundwater Elevation	feet	783.77	783.96	784.57	785.59	785.77	785.17	784.49	783.97	
Temperature	deg C	10.5	10	10.1	10.3	10.8	11	11.1	11.4	
Turbidity	NTU	6.43	2.7	0	2.66	2.83	0	0	2.38	
pH at 25 Degrees C	Std. Units	7.4	7.3	7.4	7.3	7.3	7.1	7	8.5	

Leachate Pipe Cleaning and Inspection Report

Leachate pipe inspections occurred on August 15, 2023 and January 10, 2024. An obstruction was encountered in the pipe running east-west between Module 3 and 10 during both inspections. The issue remains under review and the facility will coordinate with WDNR on a resolution in 2024. The reports on the following pages provide additional information.

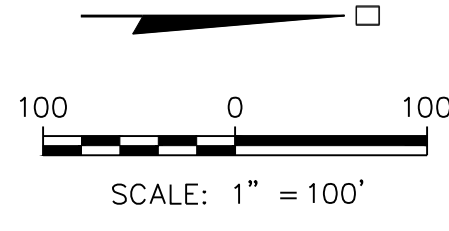
540,500 N 541,000 N 541,500 N 542,000 N 542,500 N 543,000 N 543,500 N



LEGEND

- - - - - DRY ASH DISPOSAL FACILITY LIMITS
- - - - - LIMITS OF WASTE
- - - - - LINER PHASE/MODULE LIMIT
- - - - - FINAL COVER LIMITS
- - - - - APPROXIMATE INTERMEDIATE COVER LIMITS/AREA
- - - - - LIMITS OF 2" THICK CLAY LINER
- - - - - PAVED ROAD
- - - - - UNPAVED ROAD
- - - - - RAILROAD TRACKS
- - - - - VEGETATION
- - - - - FENCE
- - - - - OVERHEAD UTILITY
- - - - - EXISTING GRADE (10' INTERVAL)
- - - - - EXISTING GRADE (2' INTERVAL)
- - - - - SWALE
- - - - - EDGE OF WATER
- - - - - WETLAND
- - - - - CULVERT
- - - - - TRANSMISSION TOWER
- - - - - UTILITY POLE
- - - - - MONITORING WELL
- - - - - PIEZOMETER
- - - - - WATER SUPPLY WELL
- - - - - STAFF GAUGE
- - - - - SURFACE WATER SAMPLE LOCATION
- - - - - LEACHATE HEADWELL
- - - - - LEACHATE RISER/CLEANOUT
- - - - - LYSIMETER MANHOLE
- - - - - ABANDONED MONITORING WELL
- - - - - ABANDONED PIEZOMETER
- - - - - ABANDONED TEMPORARY WATER TABLE WELL
- - - - - BENCHMARK

NOTES:
1. SEE SHEET 2 FOR BASE MAP NOTES.



Portion of leachate line was jetted and televised on 1/10/2024. No issues were observed. Leachate collection observed 300ft into inspection.

Portion of leachate line was jetted and televised on 1/10/2024. No issues were observed.

Portion of leachate line was jetted and televised in 2023 and remainder on 1/10/2024. No issues were observed. Extension installed previously denied access to the jetting crew. Extension was cut and replaced.

Portion of leachate line was jetted and televised in 2023 and remainder on 1/10/2024. No issues were observed.

Portion of the leachate pipe contained a collection of dark leachate. Backed up from Module 10?

Portion of the leachate pipe was unable to be reached.

Pipe was televised/jetted previously in 2023. No issues observed.

Pipe was televised/jetted previously in 2023. No issues observed.

Module 10 leachate line was jetted and televised. Pipe appeared to be clear however underwater. Another inspection needed in the spring when water is removed. 1/10/2024 572 ft televised / jetted.

Portion of leachate line was jetted and televised previously in 2023. No issues were observed.

Portion of leachate line was jetted and televised on 1/10/2024 (319 ft). No issues were observed.

Portion of leachate line was unable to be reached by the jetting crew. No issues suspected in area.

Pipe was televised/jetted previously in 2023. No issues observed.

PROJECT NO. 25220183.00 DRAWN BY: KJP
 CHECKED BY: PEG 01/15/2022
 APPROVED BY: MWL 07/29/2022
 WISCONSIN POWER AND LIGHT COMPANY CLIENT
 78375 MURRAY ROAD, PARKEVILLE, WI 53854
SCS ENGINEERS
 2830 DARY DRIVE, MADISON, WI 53718-0797
 PHONE: (608) 224-2830
 ENGINEER
 ISSUED FOR CONSTRUCTION
 PRIMARY AND SECONDARY ASH POND CLOSURE AND DRY ASH DISPOSAL FACILITY EXPANSION
 COLUMBIA ENERGY CENTER
 SITE
 EXISTING CONDITIONS - ASH DISPOSAL FACILITY
 SHEET 9 of 25

2023

Ames Construction, Portage Power Plant

Leachate Jet and CCTV

Portage, WI

AQUALIS[®]

Formerly Northern Pipe, Inc.

2094 COUNTY RD QQ GREEN BAY, WI 54311 | ☎ 920-468-7074

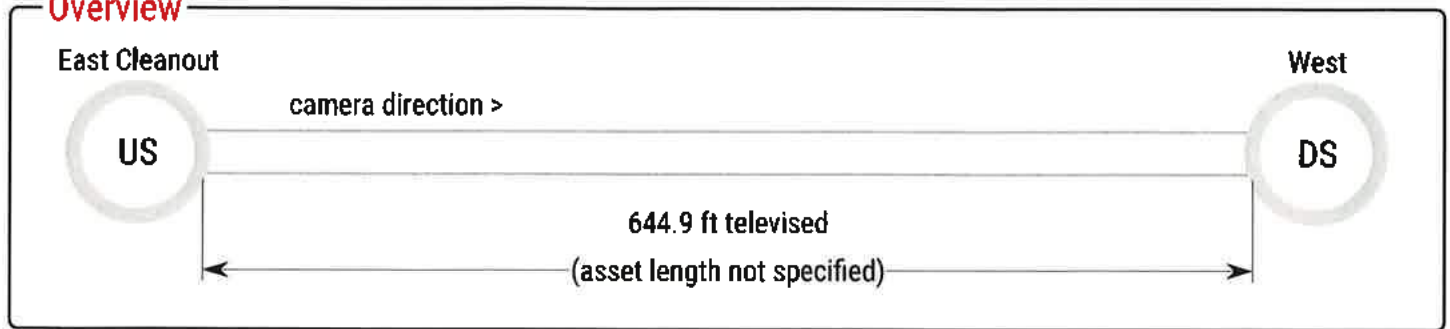
Table of Contents

Inspections

East Cleanout – West	1
East Cleanout – West	4
East Cleanout – West	7
East Cleanout – West	10
East Cleanout – West	13
East Cleanout – West	16
Northeast Cleanout – West	19
South Cleanout – North	22

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass: West
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

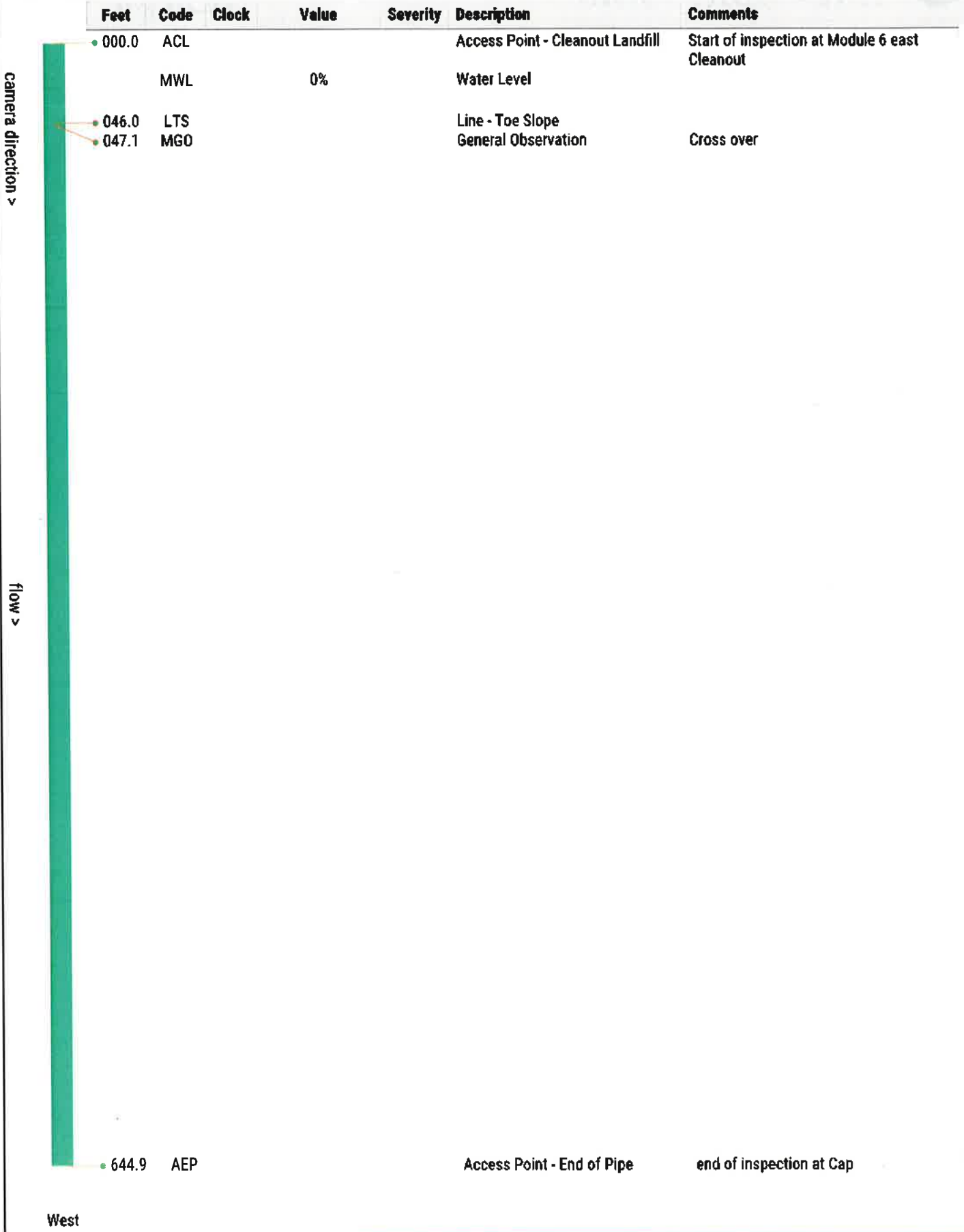
Start Time: 15 - Aug - 2023 09:41
 End Time: 10:32
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 6
 City: City Of Portage

Observations

East Cleanout



West

Snapshots



ACL at 000.0 ft | Start of inspection at Module 6 east Cleanout



MWL at 000.0 ft



LTS at 046.0 ft



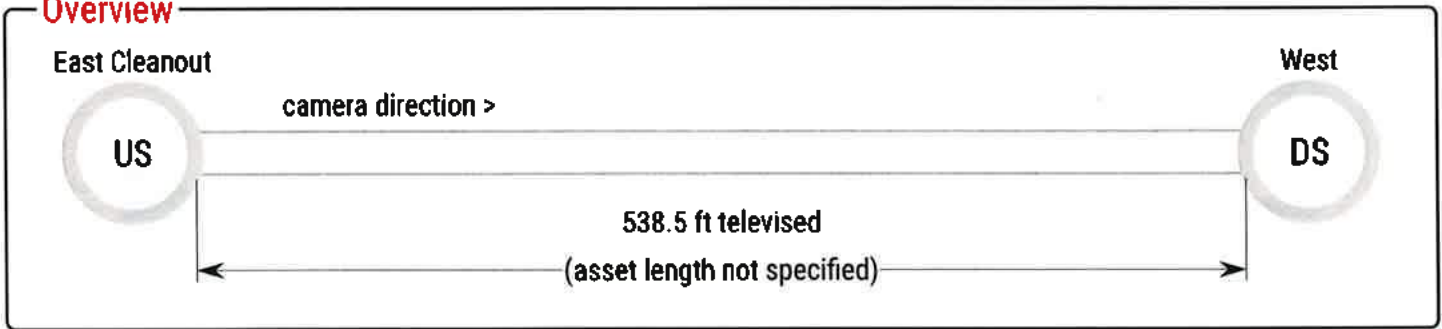
MGO at 047.1 ft | Cross over



AEP at 644.9 ft | end of inspection at Cap

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

Start Time: 15 • Aug • 2023 10:43
 End Time: 11:17
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 5
 City: City Of Portage

Observations

East Cleanout

Feet	Code	Clock	Value	Severity	Description	Comments
000.0	ACL				Access Point - Cleanout Landfill	Start of inspection at Module 5 east Cleanout
	MWL		0%		Water Level	
042.4	LTS				Line - Toe Slope	
044.2	MGO				General Observation	crossover
538.5	MSA				Survey Abandoned	as far as Nozzle and camera will go due to length and friction from bend in pipe - end of inspection

camera direction >

flow >

West

Snapshots



ACL at 000.0 ft | Start of inspection at Module 5 east Cleanout



MWL at 000.0 ft



LTS at 042.4 ft



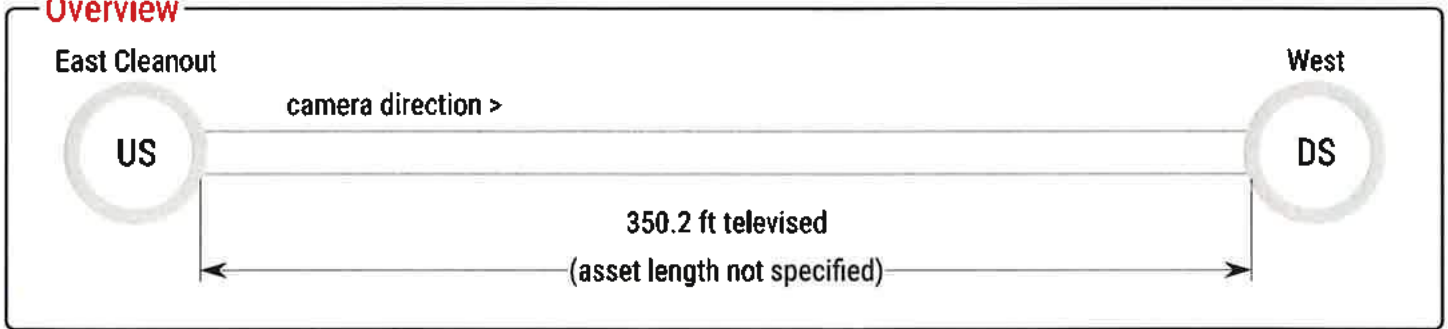
MGO at 044.2 ft | crossover



MSA at 538.5 ft | as far as Nozzle and camera will go due to length and friction from bend in

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

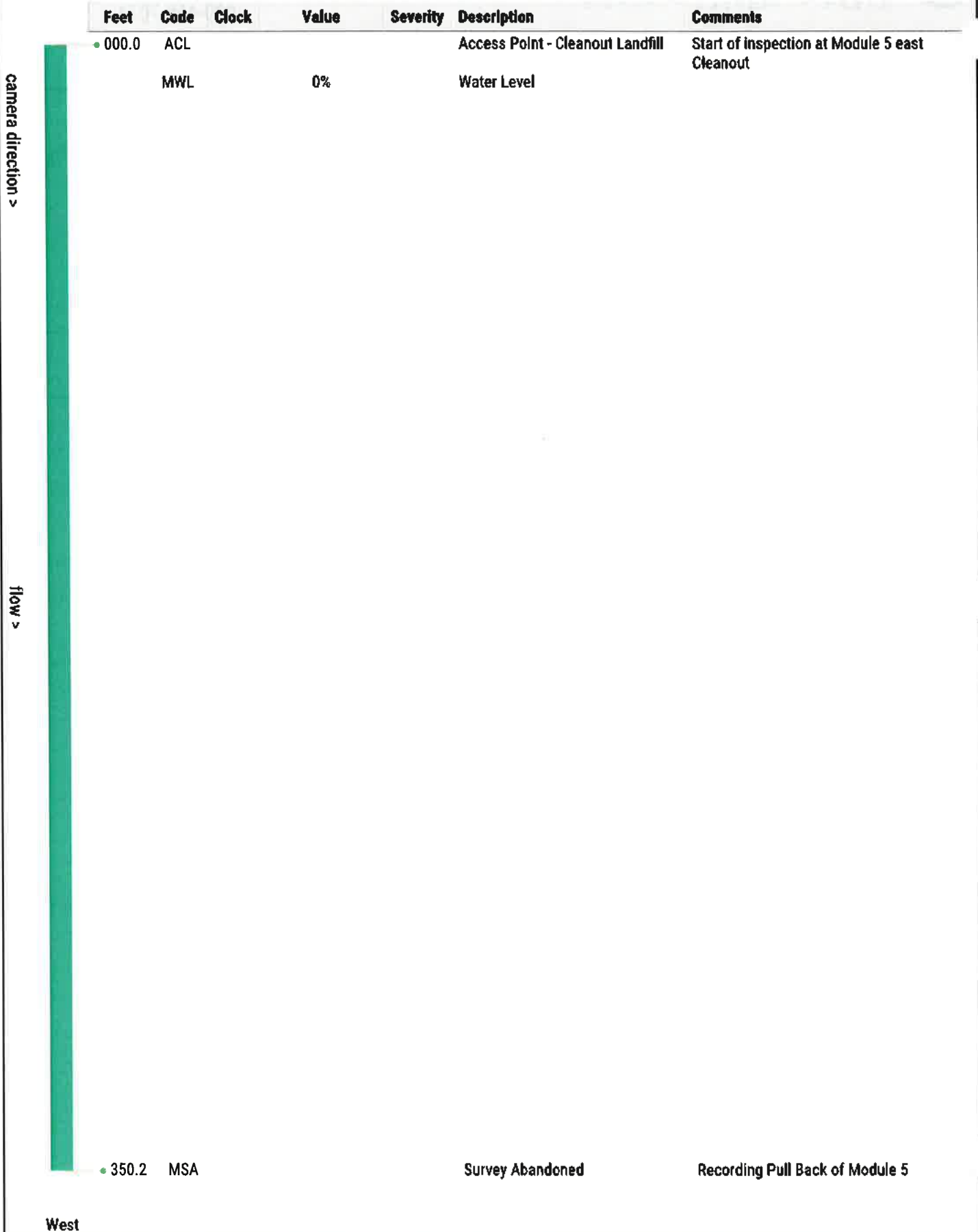
Start Time: 15 · Aug · 2023 11:20
 End Time: 11:26
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 5
 City: City Of Portage

Observations

East Cleanout



Snapshots



ACL at 000.0 ft | Start of inspection at Module 5 east Cleanout



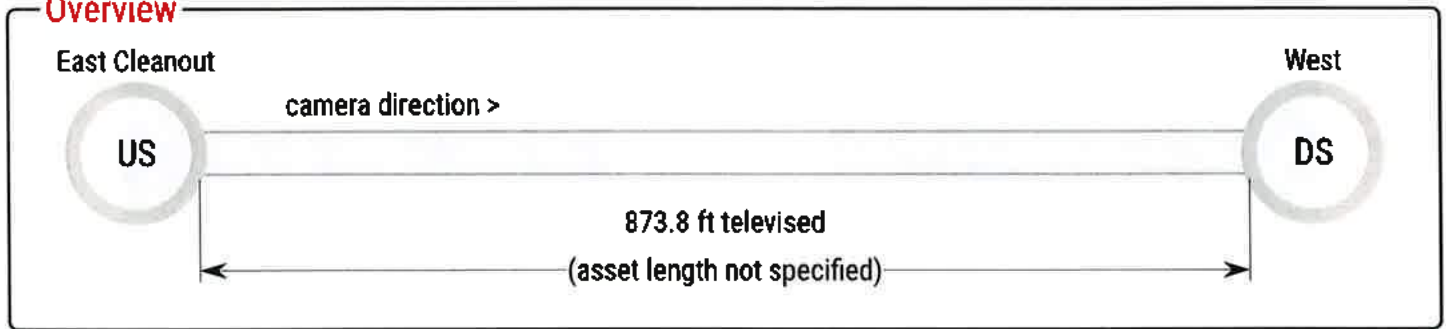
MWL at 000.0 ft



MSA at 350.2 ft | Recording Pull Back of Module 5

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

Start Time: 15 • Aug • 2023 11:38
 End Time: 12:31
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

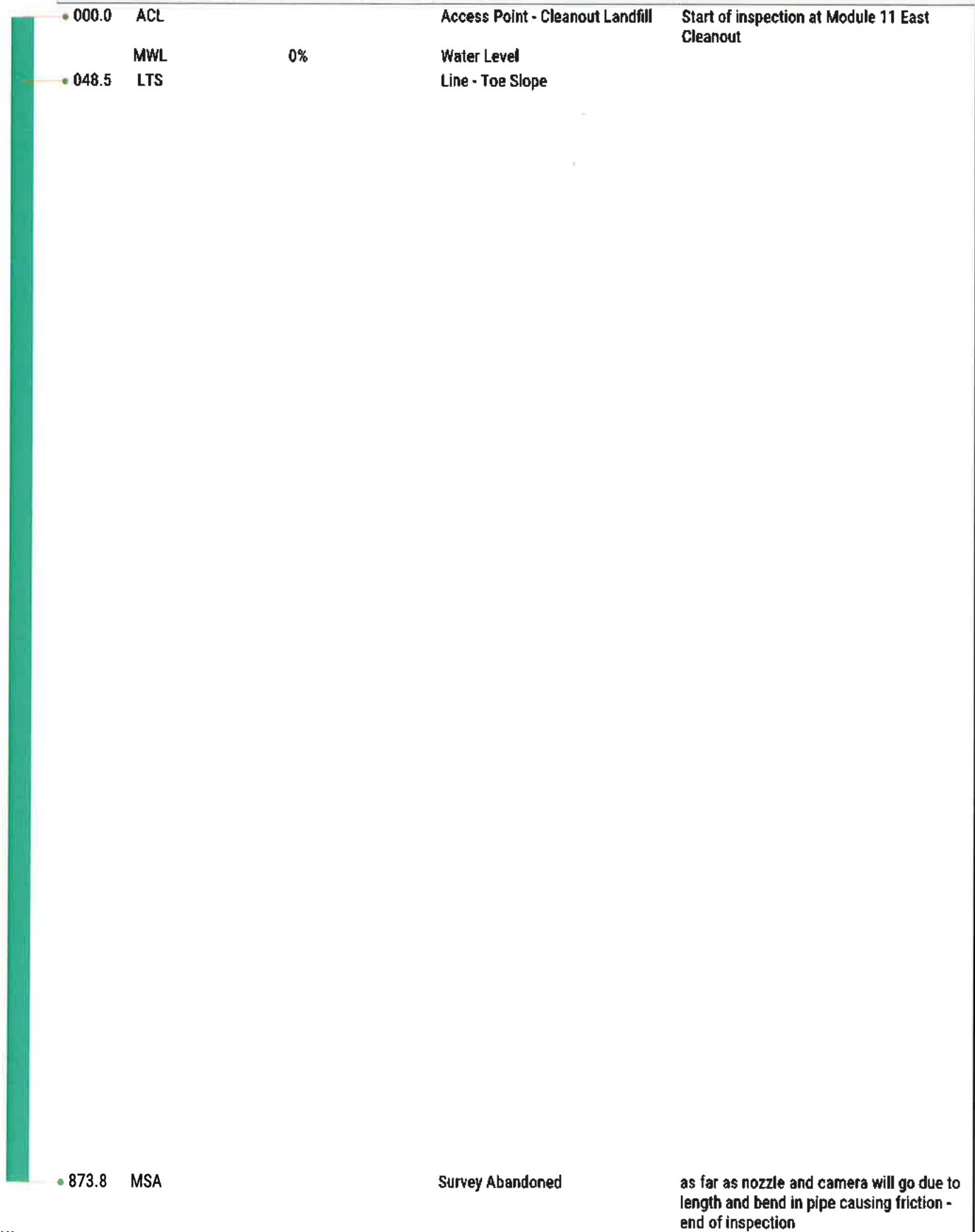
Location

Street: Module 11
 City: City Of Portage

Observations

East Cleanout

Feet	Code	Clock	Value	Severity	Description	Comments
------	------	-------	-------	----------	-------------	----------



000.0	ACL				Access Point - Cleanout Landfill	Start of inspection at Module 11 East Cleanout
-------	-----	--	--	--	----------------------------------	--

048.5	LTS		0%		Water Level Line - Toe Slope	
-------	-----	--	----	--	------------------------------	--

873.8	MSA				Survey Abandoned	as far as nozzle and camera will go due to length and bend in pipe causing friction - end of inspection
-------	-----	--	--	--	------------------	---

West

Snapshots



ACL at 000.0 ft | Start of inspection at Module 11 East Cleanout



MWL at 000.0 ft



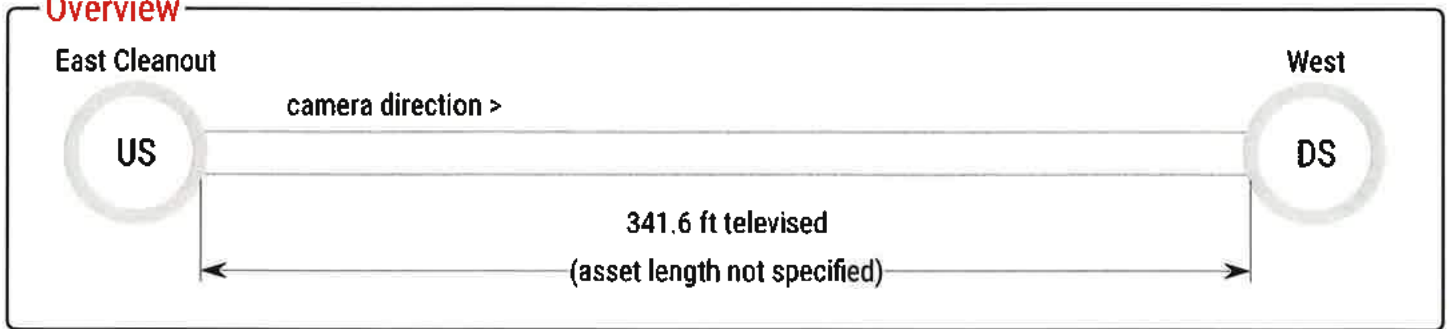
TS at 048.5 ft



MSA at 873.8 ft | as far as nozzle and camera will go due to length and bend in pipe causing

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

Start Time: 15 · Aug · 2023 12:37
 End Time: 12:55
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 10
 City: City Of Portage

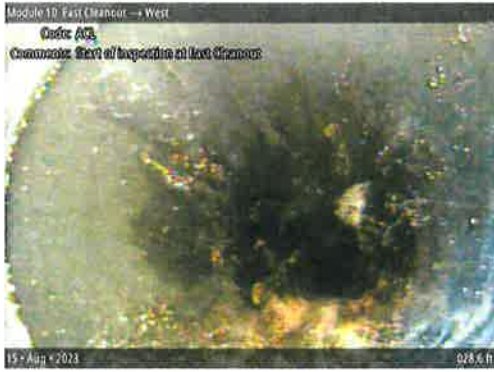
Observations

East Cleanout

	Feet	Code	Clock	Value	Severity	Description	Comments
camera direction >	000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at East Cleanout
	050.8	LTS				Line - Toe Slope	
	079.9	DSZ	5 - 7			Deposits Settled: Other	Leachate Shale
flow >	341.6	MSA				Survey Abandoned	Nozzle and camera will not go further due to friction and settled deposits causing restriction - do not want camera wedged from any more debris - end of inspection

West

Snapshots



ACL at 000.0 ft | Start of inspection at East Cleanout



MWL at 000.0 ft



LTS at 050.8 ft



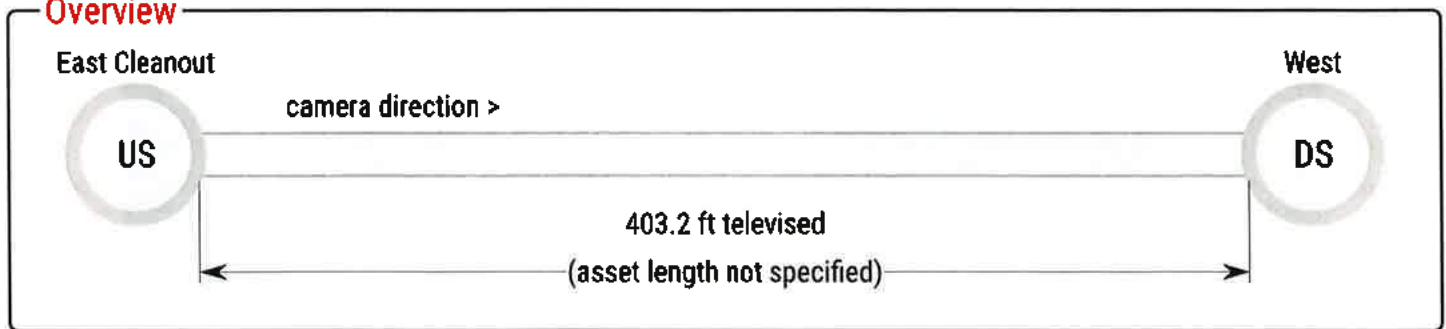
DSZ at 079.9 ft, 5 - 7 o'clock | Leachate Shale



MSA at 341.6 ft | Nozzle and camera will not go further due to friction and settled deposits

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

Start Time: 15 • Aug • 2023 13:33
 End Time: 13:54
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 2
 City: City Of Portage

Observations

East Cleanout

Feet	Code	Clock	Value	Severity	Description	Comments
------	------	-------	-------	----------	-------------	----------

000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at East Cleanout
-------	------------	--	----	--	---	--------------------------------------

026.0	LTS				Line - Toe Slope	
-------	-----	--	--	--	------------------	--

403.2	MSA				Survey Abandoned	as far as Nozzle & Camera will push due to length and bends in pipe causing friction - end of inspection
-------	-----	--	--	--	------------------	--

camera direction >

flow >

West

Snapshots



ACL at 000.0 ft | Start of inspection at East Cleanout



MWL at 000.0 ft



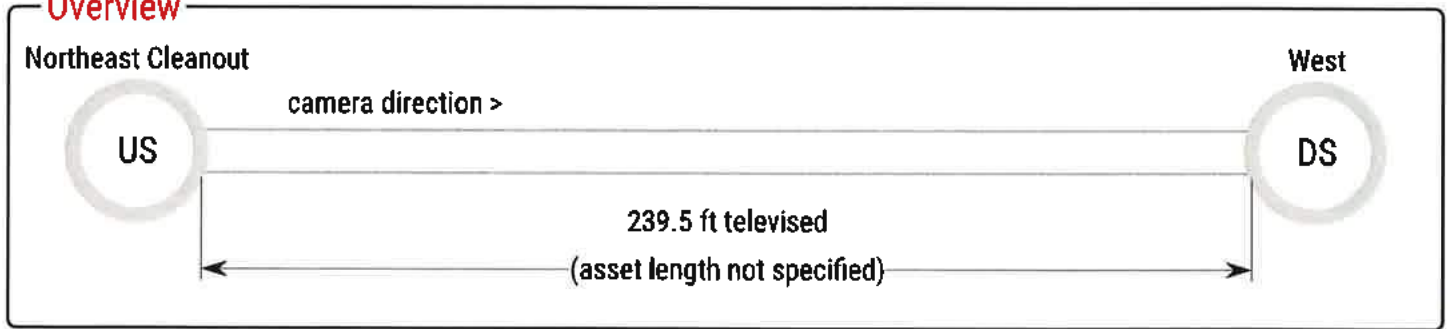
LTS at 026.0 ft



MSA at 403.2 ft | as far as Nozzle & Camera will push due to length and bends in pipe

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

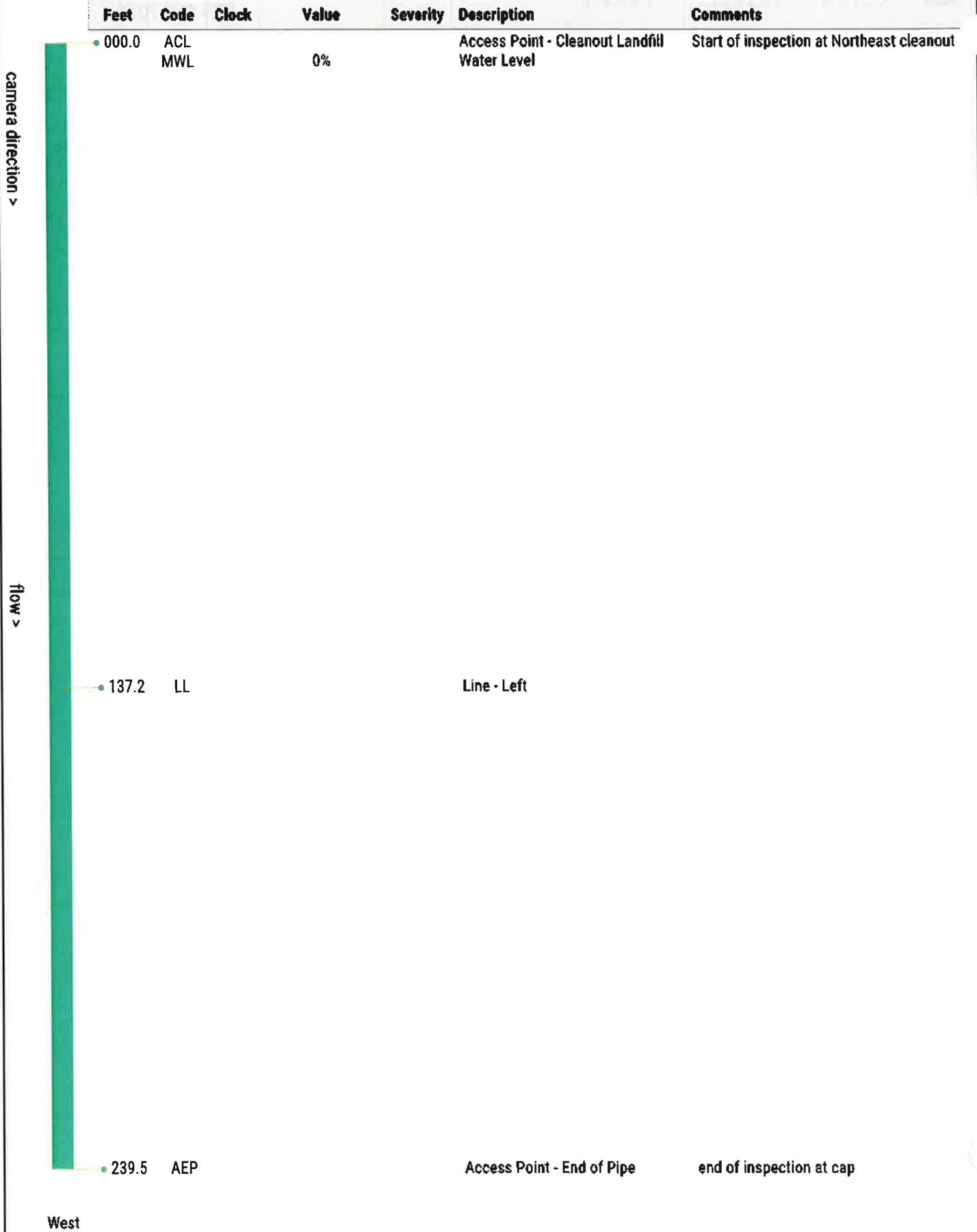
Start Time: 15 - Aug - 2023 14:02
 End Time: 14:18
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Module 1
 City: City Of Portage

Observations

Northeast Cleanout



West

Snapshots



ACL at 000.0 ft | Start of inspection at Northeast cleanout



MWL at 000.0 ft



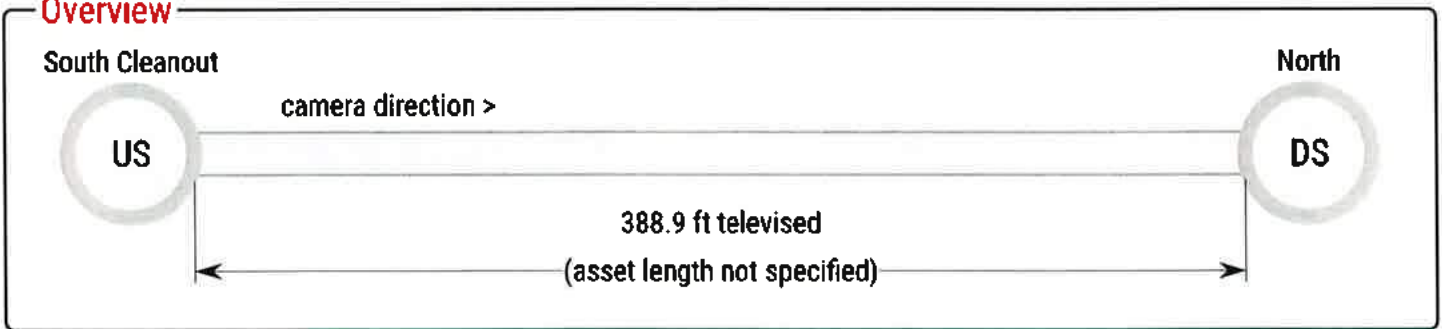
LL at 137.2 ft



AEP at 239.5 ft | end of inspection at cap

Pipeline Inspection Report

Overview



Asset

Owner: Alliant Energy
 Compass:
 Size: 6.0 in
 Material: Polyethylene
 Joint Material:
 Joint Length:
 Sewer Use: Leachate
 Comments:

Inspection

Start Time: 15 • Aug • 2023 12:57
 End Time: 13:29
 Customer: Ames Construction
 Camera Direction: Downstream
 Surveyor Name: Shayne DeGrave (NPI)
 Purpose: Routine Assessment
 Pre-Cleaning: Jetting
 Weather: Dry
 Media ID:
 PressureValue:
 WorkOrder: 2079
 Project:
 Comments:

Location

Street: Headwell
 City: City Of Portage

Observations

South Cleanout

camera direction >

flow >



Feet	Code	Clock	Value	Severity	Description	Comments
000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at South Cleanout
056.0	LR				Line - Right	
140.5	MGO				General Observation	Crossover
153.2	MCU				Camera Underwater	
192.9	MWL		0%		Water Level	
388.9	AEP				Access Point - End of Pipe	end of inspection at Cap

North

Snapshots



ACL at 000.0 ft | Start of inspection at South Cleanout



MWL at 000.0 ft



LR at 056.0 ft



MGO at 140.5 ft | Crossover



MCU at 153.2 ft



MWL at 192.9 ft



AEP at 388.9 ft | end of inspection at Cap

Map	Street	Upstream	Downstream	Height	Length	Comments
	MODULE 6	E	W	6.0	644.9	
	MODULE 5	E	W	6.0	538.5	CAN NOT PUSH ANYMORE
	MODULE 11	E	W	6.0	873.8	CAN NOT PUSH ANYMORE
	MODULE 10	E	W	6.0		GRIT AT BOTTOM CAN NOT GO
					341.6	ANYMORE
	MODULE 6	E	W	6.0	403.2	CAN NOT PUSH ANYMORE
	HEADWELL	S	N	6.0	388.9	CAPPED
	MODULE 1	NE	W	6.0	239.5	END
	MODULE 6	E	W	6.0	350.2	
					3780.6	

2024

Columbia Energy

Leachate Jetting and CCTV

Portage, WI

AQUALIS[®]

Formerly Northern Pipe, Inc.

2094 COUNTY RD QQ GREEN BAY, WI 54311 | ☎ 920-468-7074



Formerly Northern Pipe, Inc.

2094 County Road QQ
Green Bay, Wisconsin 54311
920-468-7074
www.aqualisco.com

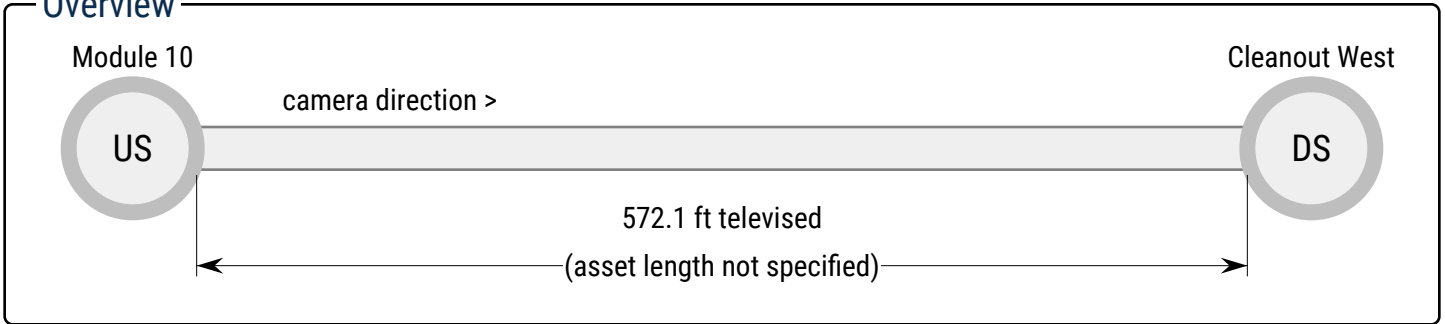
Table of Contents

Inspections

Module 10 – Cleanout West	1
Module 2 – Cleanout East	4
Module 3 – East Cleanout	7
Module 4 – East Cleanout	10
Module 5 – East Cleanout	13
Module 6 – North Cleanout	16

Pipeline Inspection Report

Overview



Asset

Owner:

Compass:

Size:

Material:

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time:

End Time:

Customer:

Camera Direction:

Surveyor Name:

Purpose:

Pre-Cleaning:

Weather:

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

Location

Street:

City:

Observations

Module 10

	Feet	Code	Clock	Value	Severity	Description	Comments
camera direction >	000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at Module 10
	050.9	LTS				Line - Toe Slope	
	572.1	MSA				Survey Abandoned	As far as camera will push - end of inspection

Cleanout West

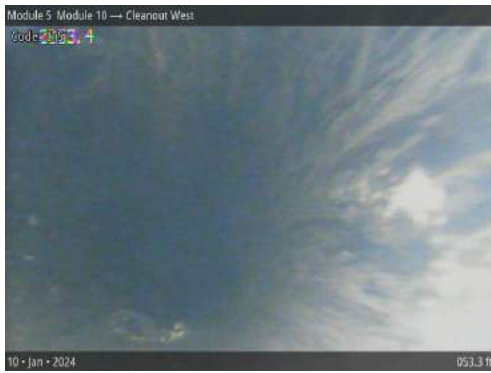
Snapshots



ACL at 000.0 ft | Start of inspection at Module 10



MWL at 000.0 ft



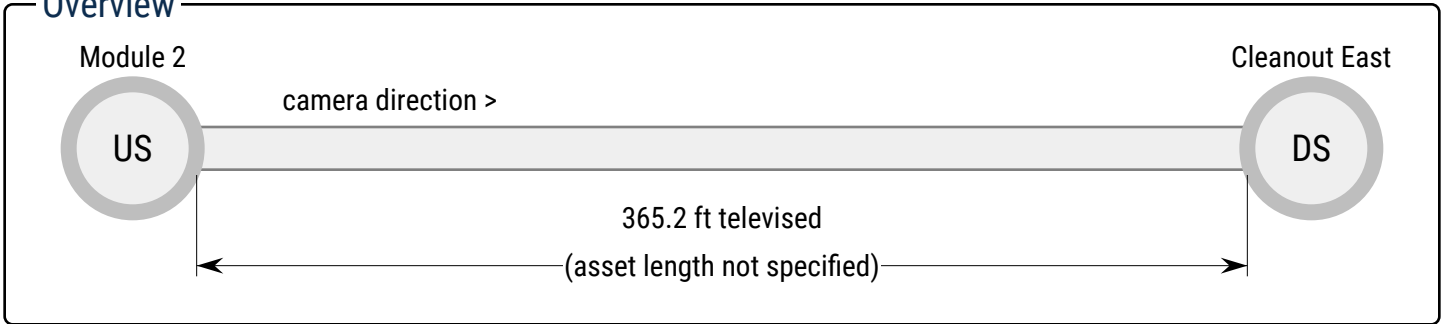
LTS at 050.9 ft



MSA at 572.1 ft | As far as camera will push - end of inspection

Pipeline Inspection Report

Overview



Asset

Owner:

Compass:

Size:

Material:

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time:

End Time:

Customer:

Camera Direction:

Surveyor Name:

Purpose:

Pre-Cleaning:

Weather:

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

Location

Street:

City:

Observations

Module 2

	Feet	Code	Clock	Value	Severity	Description	Comments
camera direction >	000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at Module 2
	063.9	LTS				Line - Toe Slope	
	365.2	MSA				Survey Abandoned	As far as needed for inspection - end of inspection

Cleanout East

Snapshots



ACL at 000.0 ft | Start of inspection at Module 2



MWL at 000.0 ft



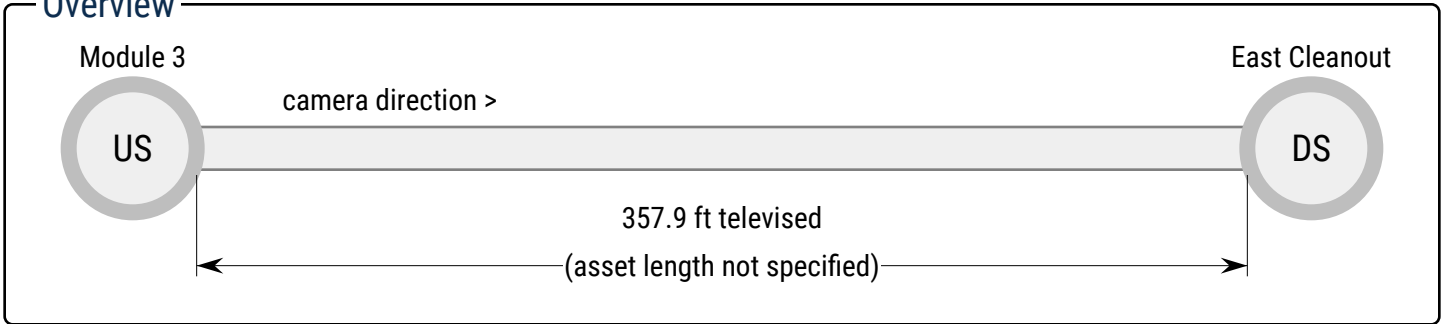
LTS at 063.9 ft



MSA at 365.2 ft | As far as needed for inspection - end of inspection

Pipeline Inspection Report

Overview



Asset

Owner:

Compass:

Size:

Material:

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time:

End Time:

Customer:

Camera Direction:

Surveyor Name:

Purpose:

Pre-Cleaning:

Weather:

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

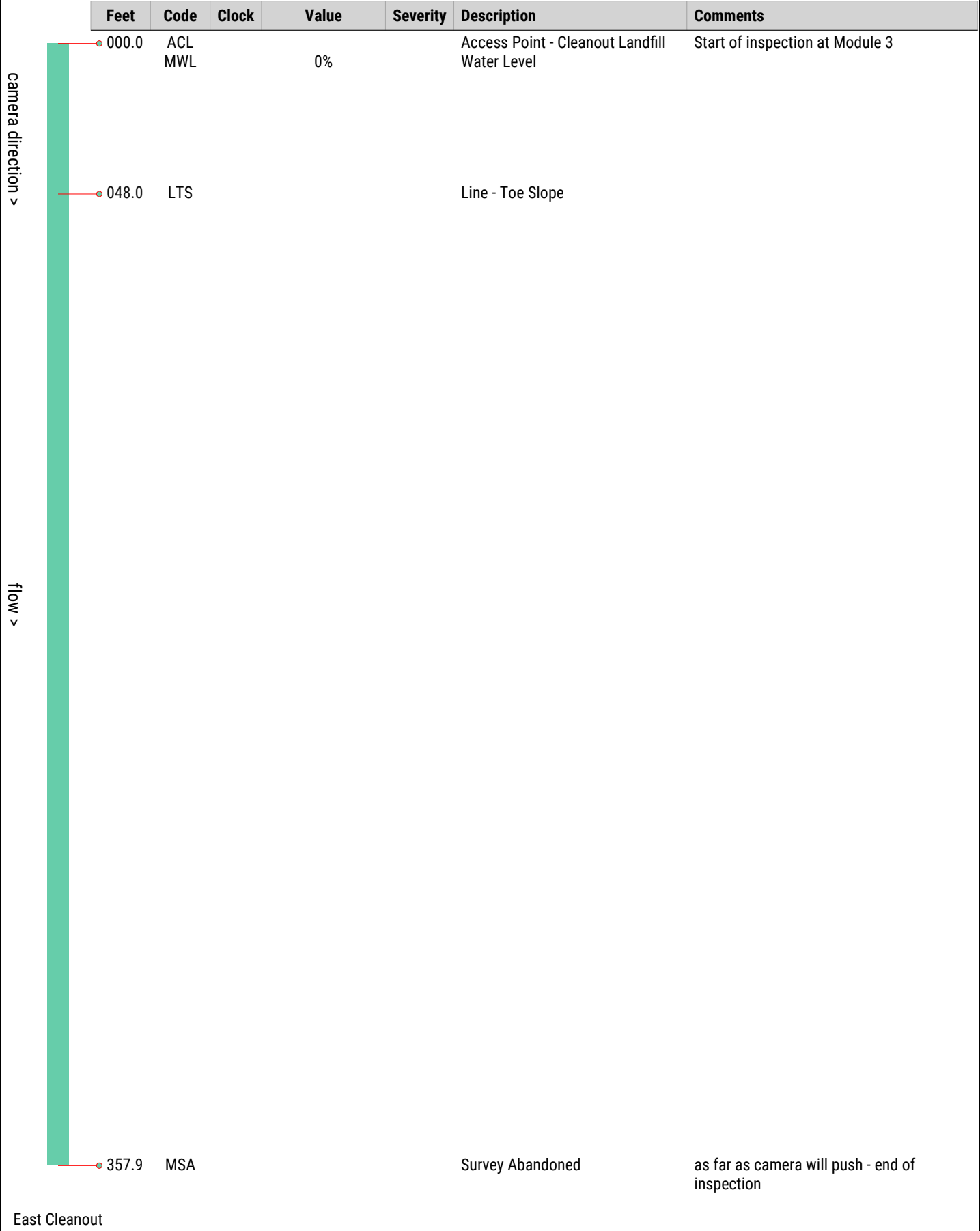
Location

Street:

City:

Observations

Module 3



East Cleanout

Snapshots



ACL at 000.0 ft | Start of inspection at Module 3



MWL at 000.0 ft



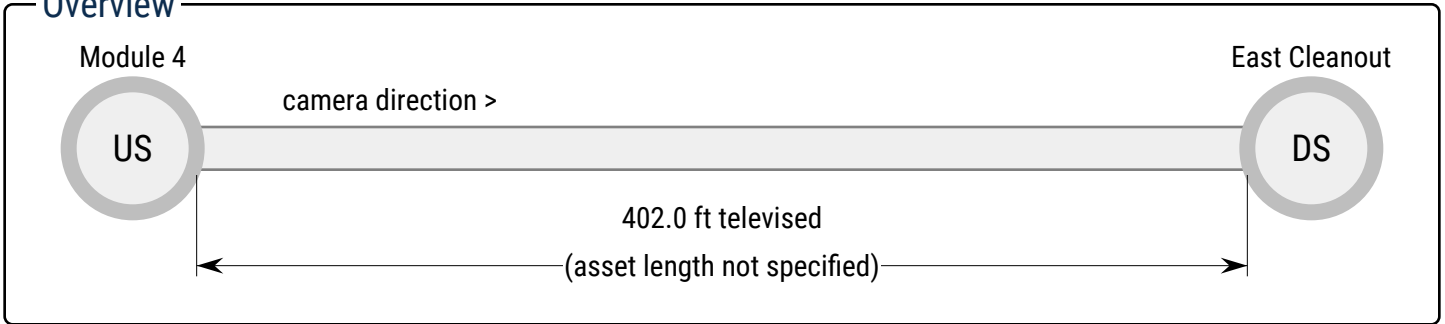
LTS at 048.0 ft



MSA at 357.9 ft | as far as camera will push - end of inspection

Pipeline Inspection Report

Overview



Asset

Owner:

Compass:

Size:

Material:

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time:

End Time:

Customer:

Camera Direction:

Surveyor Name:

Purpose:

Pre-Cleaning:

Weather:

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

Location

Street:

City:

Observations

Module 4

	Feet	Code	Clock	Value	Severity	Description	Comments
camera direction >	000.0	ACL MWL		0%		Access Point - Cleanout Landfill Water Level	Start of inspection at Module 4
	040.5	LTS				Line - Toe Slope	
	402.0	MSA				Survey Abandoned	As far as needed for inspection - end of inspection

East Cleanout

Snapshots



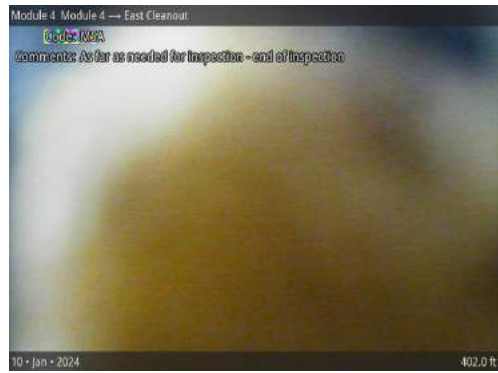
ACL at 000.0 ft | Start of inspection at Module 4



MWL at 000.0 ft



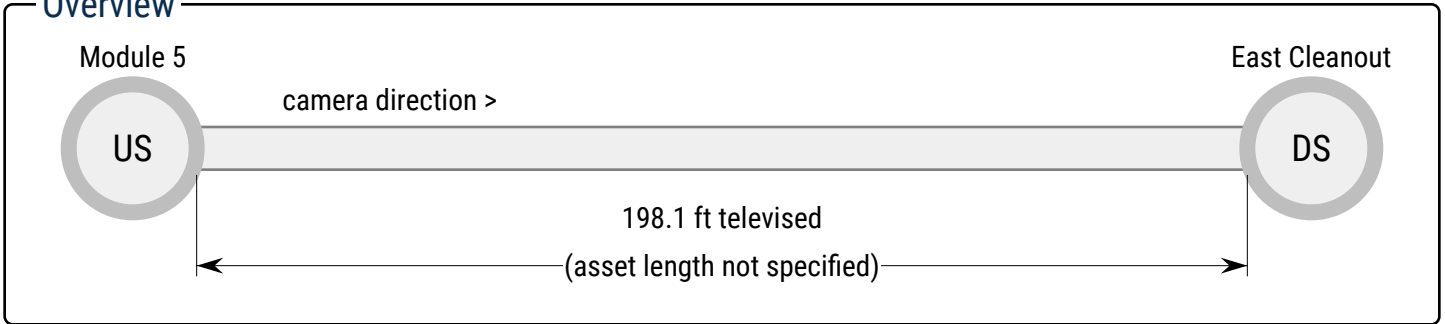
LTS at 040.5 ft



MSA at 402.0 ft | As far as needed for inspection - end of inspection

Pipeline Inspection Report

Overview



Asset

Owner:

Compass:

Size:

Material:

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time:

End Time:

Customer:

Camera Direction:

Surveyor Name:

Purpose:

Pre-Cleaning:

Weather:

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

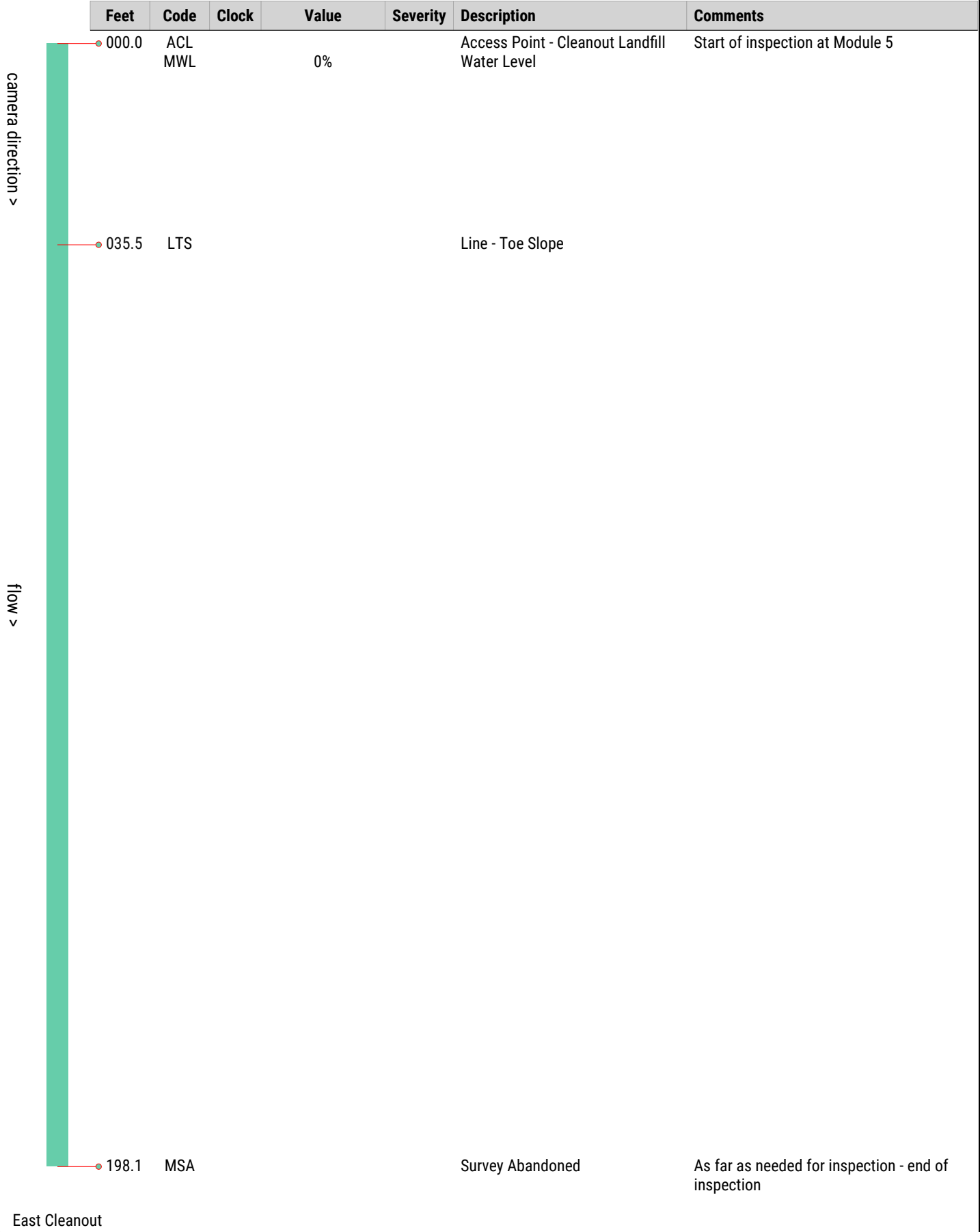
Location

Street:

City:

Observations

Module 5



East Cleanout

Snapshots



ACL at 000.0 ft | Start of inspection at Module 5



MWL at 000.0 ft



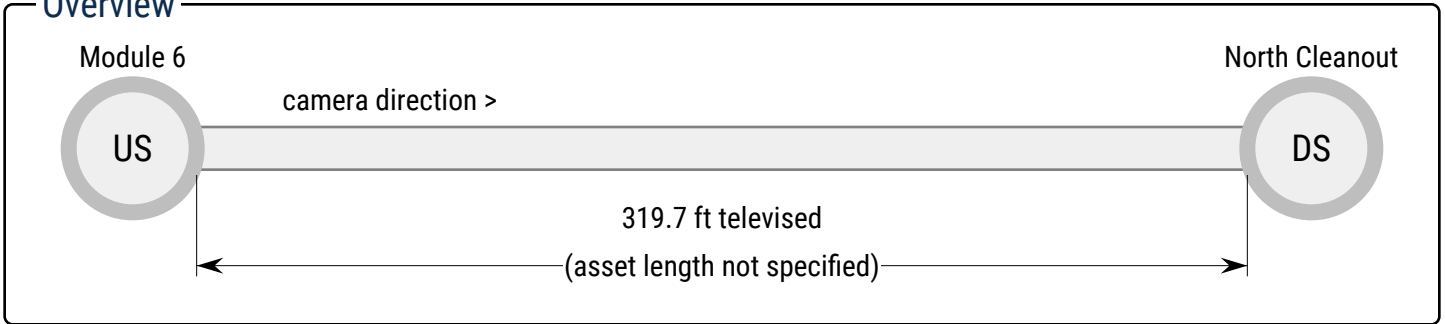
LTS at 035.5 ft



MSA at 198.1 ft | As far as needed for inspection - end of inspection

Pipeline Inspection Report

Overview



Asset

Owner: Columbia Energy Center

Compass: South

Size: 6.0 in

Material: Polyethylene

Joint Material:

Joint Length:

Sewer Use:

Comments:

Inspection

Start Time: 10 • Jan • 2024 10:45

End Time: 11:11

Customer: Columbia Energy Center

Camera Direction: Downstream

Surveyor Name: Eric Walker

Purpose: Maintenance Related

Pre-Cleaning: Jetting

Weather: Snow

Media ID:

PressureValue:

WorkOrder:

Project:

Comments:

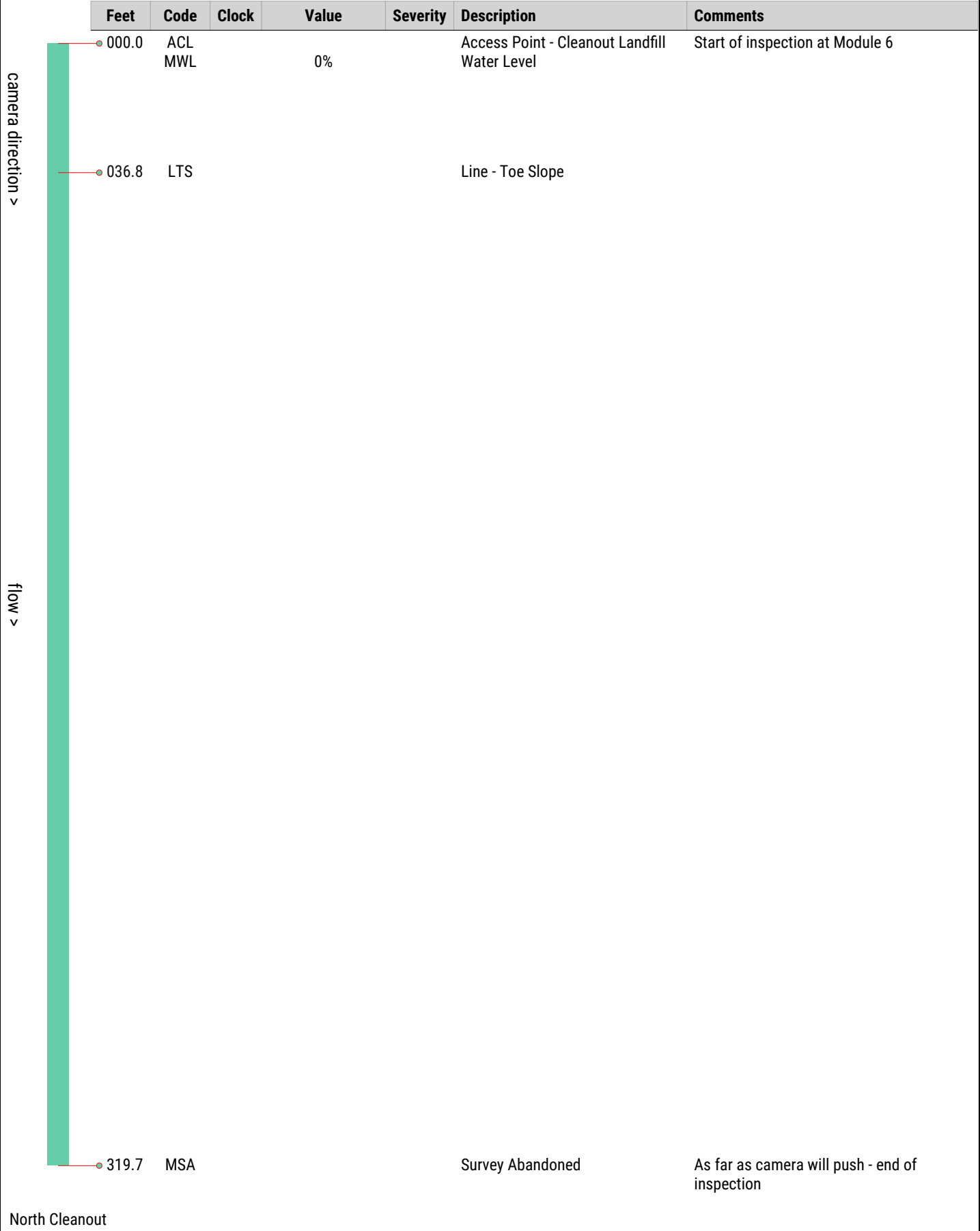
Location

Street: Module 6

City: City of Portage

Observations

Module 6



North Cleanout

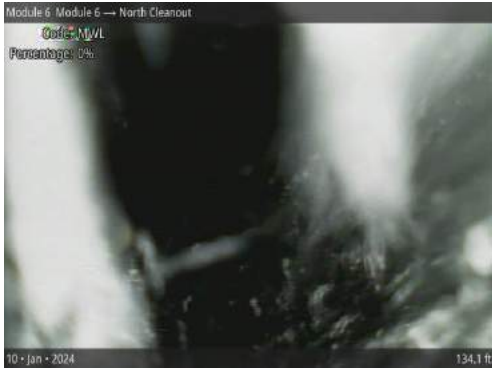
Snapshots



ACL at 000.0 ft | Start of inspection at Module 6



LTS at 036.8 ft



MWL at 000.0 ft



MSA at 319.7 ft | As far as camera will push - end of inspection

Phase	Line	Line Length	Length Cleaned	Date	Comments
	10	800	700.0	01.10.2024	As far as it goes
	3		358.0		
	Head wall	700?	320.0	01.10.2024	Stops-wll not go any further
	2	700	365.0	01.10.2024	As far as we have to go
	4	400	400.0	01.10.2024	As far as we have to go
	5	150	8.0	01.10.2024	Can't get past bend at 45
	5	150	150.0	01.10.2024	Cut off bend to get camera in
		TOTAL			
		3,000			

Total Water Used: 2500 Gallons