

2019 Annual Groundwater Monitoring and Corrective Action Report

Columbia Energy Center
Dry Ash Disposal Facility, Module 4
Pardeeville, Wisconsin

Prepared for:

Alliant Energy



SCS ENGINEERS

25219067.00 | January 31, 2020

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608-224-2830

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1.0 INTRODUCTION

This 2019 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

This report covers the period of groundwater monitoring from January 1, 2019, through December 31, 2019.

The Columbia Energy Center (COL) Dry Disposal Ash Facility is an active CCR landfill and includes three existing CCR units and one new CCR landfill unit, which became operational in 2018. The groundwater monitoring system addressed in this report is evaluating conditions at:

- COL Dry Ash Disposal Facility – Module 4

The system is designed to detect monitored constituents at the waste boundary of Module 4 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.

A separate multiunit groundwater monitoring system evaluates conditions for Modules 1 through 3 of the Dry Ash Disposal Facility. The two background (upgradient) monitoring wells are shared by both systems.

2.0 § 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:

2.1 § 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 Module 4 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**.

2.2 § 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 Module 4 of the Dry Ash Disposal Facility in 2019.

2.3 § 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 and October 2019 at COL Dry Ash Disposal Module 4 as part of ongoing detection monitoring. As part of the April 2019 semiannual event, a retest sample was collected at one monitoring well in June 2019. As part of the October 2019 sampling event, a retest sample was collected at one monitoring well in December 2019.

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 is included in **Table 1**. The results of the analytical laboratory analyses are provided in the laboratory reports in **Appendix A1** through **Appendix A3**. The June sampling event was for field pH only; therefore, there is no laboratory report.

2.4 § 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);

Detection monitoring was initiated in late October 2018, and the first semiannual detection monitoring compliance sampling event was completed in April 2019. There were no transitions between monitoring programs during 2019. The COL Dry Ash Disposal Facility, Module 4, remained in the detection monitoring program.

In 2019, the monitoring results for the April 2019 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. For the April 2019 event, an SSI for pH at MW-310 was identified; however, an alternative source demonstration (ASD) was completed, demonstrating that the SSI was determined to be due to a field data collection error that occurred during the sampling event, and not reflective of true groundwater quality. The ASD report is provided in **Appendix B**.

2.5 § 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 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

2.5.1 § 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 2019.

Summary of Key Actions Completed.

- Statistical evaluation and determination of SSIs for the April 2019 monitoring event.
- ASD report for the SSI identified from the April 2019 monitoring event.
- Two semiannual groundwater sampling and analysis events (April and October 2019).

Description of Any Problems Encountered: No problems were encountered in 2019.

Discussion of Actions to Resolve the Problems. Not applicable.

Projection of Key Activities for the Upcoming Year (2020):

- Statistical evaluation and determination of any SSIs for the October 2019 and April 2020 monitoring events.
- If an SSI is determined, then within 90 days either:
 - Complete alternative source demonstration (if applicable), or
 - Establish an assessment monitoring program.
- Two semi-annual groundwater sampling and analysis events (April and October 2020).

2.5.2 § 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.

2.5.3 § 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 report prepared to address the SSI observed for the April 2019 sampling event is provided in **Appendix B**. The ASD report is certified by a qualified professional engineer.

2.5.4 § 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.

2.5.5 § 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.

2.5.6 § 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.

2.5.7 § 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.

Table 1
CCR Rule Groundwater Samples Summary

Table 1. CCR Rule Groundwater Samples Summary
Columbia Energy Center-Dry Ash Disposal Facility MOD 4 / SCS Engineers Project #25219067.00

Sample Dates	Downgradient Wells			Background Wells	
	MW-309	MW-310	MW-311	MW-84A	MW-301
April 2-3, 2019	D	D	D	D	D
June 12, 2019	--	D-R	--	--	--
October 8-9, 2019	D	D	D	D	D
December 23, 2019	--	D-R	--	--	--
Total Samples	2	4	2	2	2

Abbreviations:

D = Detection Monitoring

D-R = Detection Monitoring Retest Sample

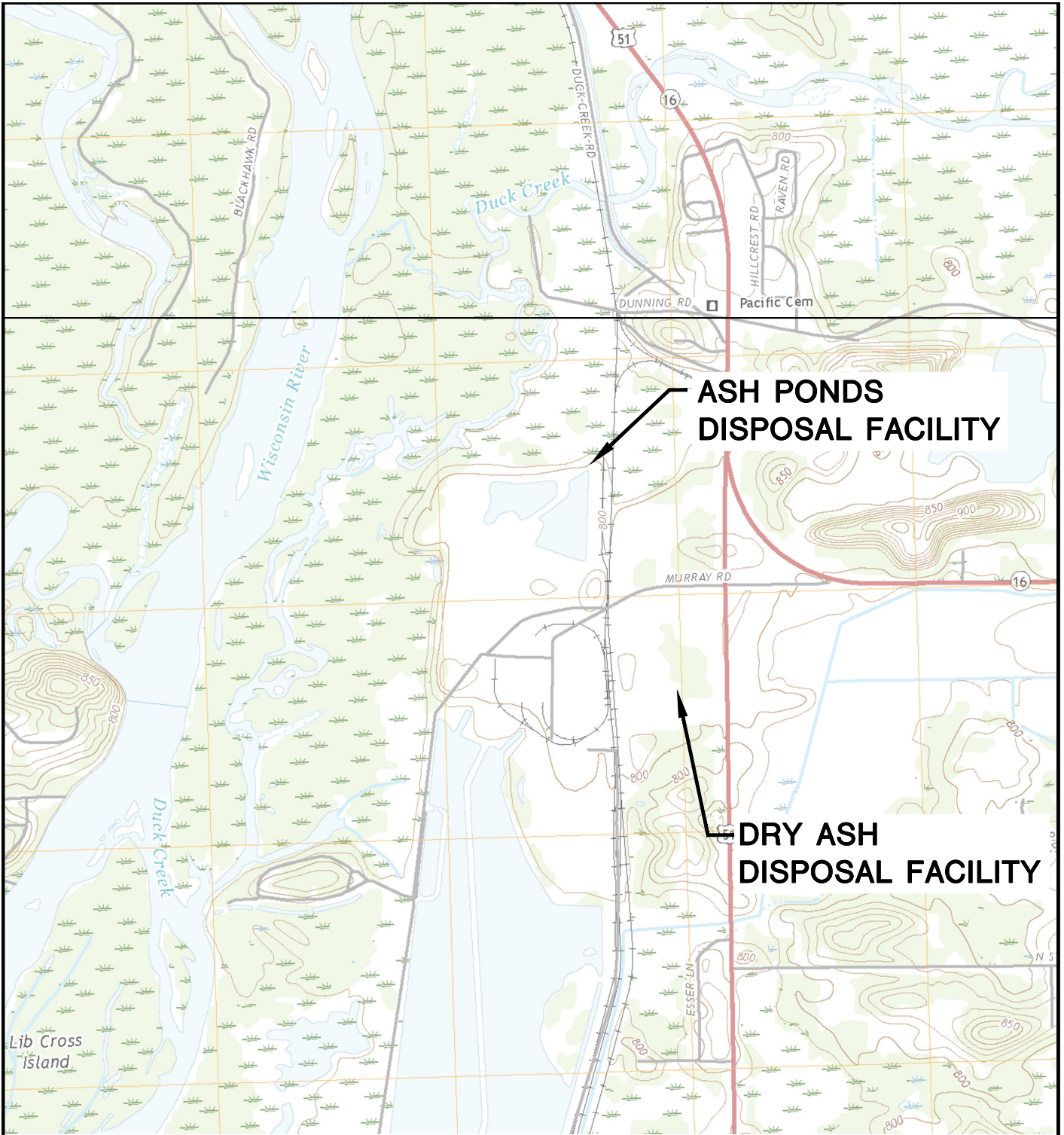
-- = Not Sampled

Created by:	<u>NDK</u>	Date:	<u>1/3/2019</u>
Last revision by:	<u>MDB</u>	Date:	<u>1/8/2020</u>
Checked by:	<u>JR</u>	Date:	<u>1/8/2020</u>

I:\25219067.00\Deliverables\2019 Federal Annual Report - MOD 4
 LF\Tables\[GW_Samples_Summary_Table_COL MOD 4.xlsx]GW Summary

Figures

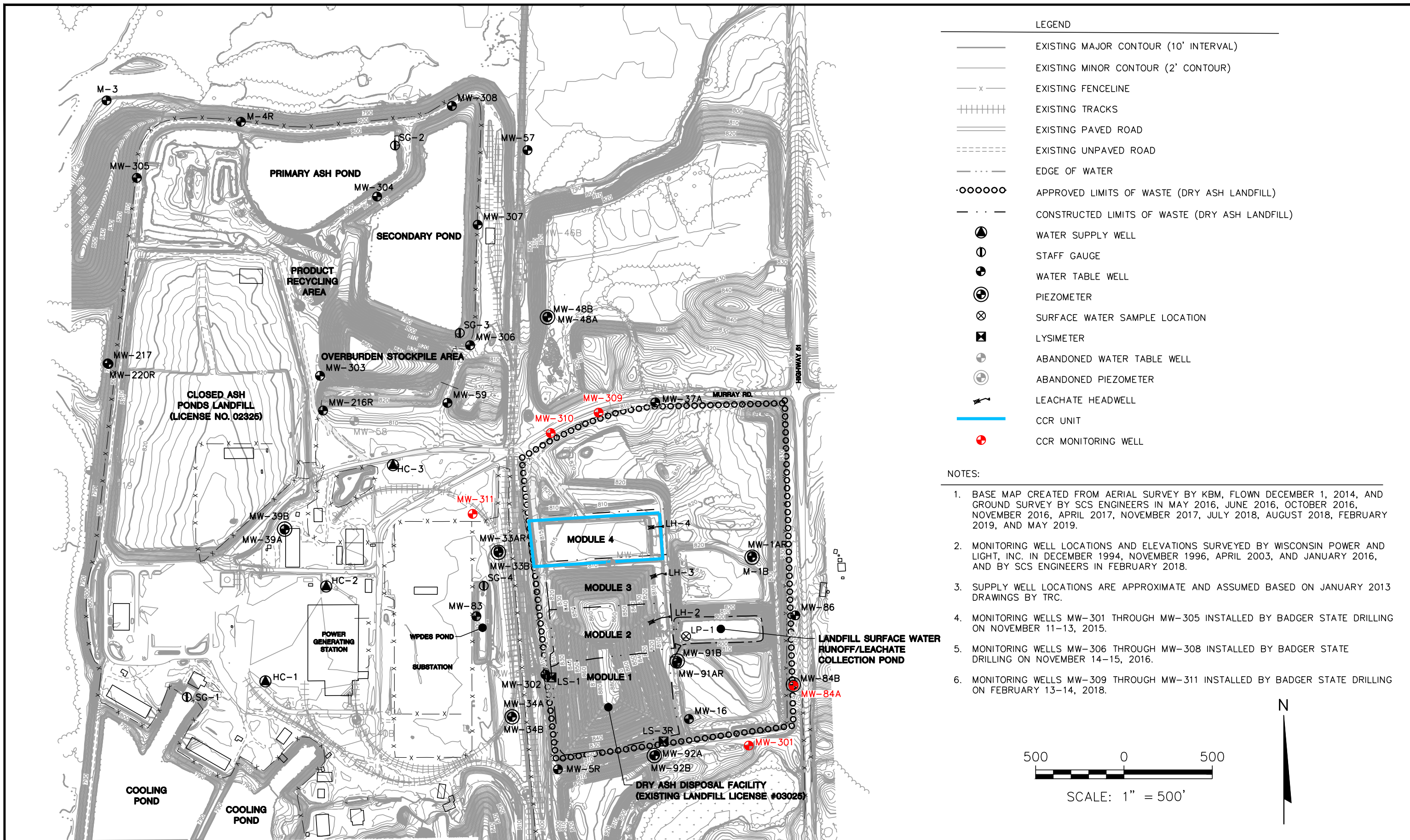
- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations



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

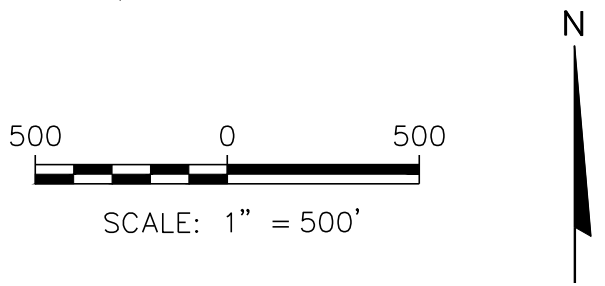


CLIENT	ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954		SITE	ALLIANT ENERGY COLUMBIA ENERGY CENTER PARDEEVILLE, WI		ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830		FIGURE 1
	PROJECT NO.	25219067.00		DRAWN BY:	BSS		APPROVED BY:	TK 01/30/2020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




- LEGEND**
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - x - EXISTING FENCELINE
 - ||||| EXISTING TRACKS
 - ==== EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - . - . - . EDGE OF WATER
 - APPROVED LIMITS OF WASTE (DRY ASH LANDFILL)
 - . . - . CONSTRUCTED LIMITS OF WASTE (DRY ASH LANDFILL)
 - ⊕ 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

- 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.



PROJECT NO. 25219067.00	DRAWN BY: BSS	<p>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830</p>	<p>ALLIANT ENERGY COLUMBIA ENERGY CENTER W8375 MURRAY ROAD PARDEEVILLE, WI 53954</p>	<p>SITE</p> <p>ALLIANT ENERGY COLUMBIA ENERGY CENTER MODULE 4 DRY ASH DISPOSAL FACILITY PARDEEVILLE, WI</p>	<p>SITE PLAN AND MONITORING WELL LOCATIONS</p>	FIGURE
DRAWN: 12/02/2019	CHECKED BY: MDB					2
REVISED: 01/13/2020	APPROVED BY: TK 01/30/2020					



Appendix A
Laboratory Reports

A1 April 2019 Detection Monitoring

April 22, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185521

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40185260005	MW-309	Water	04/02/19 09:10	04/04/19 09:30
40185260006	MW-310	Water	04/02/19 09:55	04/04/19 09:30
40185260007	MW-311	Water	04/02/19 10:50	04/04/19 09:30
40185260008	FIELD BLANK MOD4	Water	04/02/19 09:55	04/04/19 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40185260005	MW-309	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40185260006	MW-310	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40185260007	MW-311	EPA 6020	KXS	2
			AXL	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40185260008	FIELD BLANK MOD4	EPA 6020	KXS	2
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Sample: MW-309 **Lab ID: 40185260005** Collected: 04/02/19 09:10 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Boron	37.4	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 07:57	7440-42-8	
Calcium	45300	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 07:57	7440-70-2	
Field Data		Analytical Method:							
Field pH	7.49	Std. Units			1		04/02/19 09:10		
Field Specific Conductance	1041	umhos/cm			1		04/02/19 09:10		
Oxygen, Dissolved	9.79	mg/L			1		04/02/19 09:10	7782-44-7	
REDOX	120.1	mV			1		04/02/19 09:10		
Turbidity	1.25	NTU			1		04/02/19 09:10		
Static Water Level	786.30	feet			1		04/02/19 09:10		
Temperature, Water (C)	10.1	deg C			1		04/02/19 09:10		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	548	mg/L	20.0	8.7	1		04/09/19 12:36		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	7.7	Std. Units	0.10	0.010	1		04/09/19 11:07		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	145	mg/L	10.0	2.5	5		04/15/19 18:12	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		04/15/19 12:36	16984-48-8	
Sulfate	35.2	mg/L	3.0	1.0	1		04/15/19 12:36	14808-79-8	

Sample: MW-310 **Lab ID: 40185260006** Collected: 04/02/19 09:55 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Boron	73.0	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 08:04	7440-42-8	
Calcium	38800	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 08:04	7440-70-2	
Field Data		Analytical Method:							
Field pH	9.79	Std. Units			1		04/02/19 09:55		
Field Specific Conductance	924	umhos/cm			1		04/02/19 09:55		
Oxygen, Dissolved	7.86	mg/L			1		04/02/19 09:55	7782-44-7	
REDOX	119.0	mV			1		04/02/19 09:55		
Turbidity	1.13	NTU			1		04/02/19 09:55		
Static Water Level	786.38	feet			1		04/02/19 09:55		
Temperature, Water (C)	10.5	deg C			1		04/02/19 09:55		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	470	mg/L	20.0	8.7	1		04/09/19 12:36		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185521

Sample: MW-310 Lab ID: 40185260006 Collected: 04/02/19 09:55 Received: 04/04/19 09:30 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH Analytical Method: EPA 9040									
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		04/09/19 11:09		H6
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Chloride	76.0	mg/L	10.0	2.5	5		04/15/19 18:24	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		04/15/19 12:48	16984-48-8	
Sulfate	58.4	mg/L	3.0	1.0	1		04/15/19 12:48	14808-79-8	

Sample: MW-311 Lab ID: 40185260007 Collected: 04/02/19 10:50 Received: 04/04/19 09:30 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Boron	35.7	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 08:24	7440-42-8	
Calcium	65600	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 08:24	7440-70-2	
Field Data Analytical Method:									
Field pH	7.51	Std. Units			1		04/02/19 10:50		
Field Specific Conductance	337.8	umhos/cm			1		04/02/19 10:50		
Oxygen, Dissolved	9.77	mg/L			1		04/02/19 10:50	7782-44-7	
REDOX	116.3	mV			1		04/02/19 10:50		
Turbidity	2.91	NTU			1		04/02/19 10:50		
Static Water Level	786.38	feet			1		04/02/19 10:50		
Temperature, Water (C)	9.7	deg C			1		04/02/19 10:50		
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	276	mg/L	20.0	8.7	1		04/09/19 12:36		
9040 pH Analytical Method: EPA 9040									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		04/09/19 11:10		H6
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Chloride	1.9J	mg/L	2.0	0.50	1		04/15/19 17:47	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		04/15/19 17:47	16984-48-8	
Sulfate	23.1	mg/L	3.0	1.0	1		04/15/19 17:47	14808-79-8	

Sample: FIELD BLANK MOD4 Lab ID: 40185260008 Collected: 04/02/19 09:55 Received: 04/04/19 09:30 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Boron	<3.3	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 05:07	7440-42-8	
Calcium	<69.8	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 05:07	7440-70-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Sample: FIELD BLANK MOD4 **Lab ID: 40185260008** Collected: 04/02/19 09:55 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		04/09/19 12:36		
9040 pH	Analytical Method: EPA 9040								
pH at 25 Degrees C	7.1	Std. Units	0.10	0.010	1		04/09/19 11:14		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	<0.50	mg/L	2.0	0.50	1		04/15/19 13:49	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		04/15/19 13:49	16984-48-8	
Sulfate	<1.0	mg/L	3.0	1.0	1		04/15/19 13:49	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185521

QC Batch: 317485 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

METHOD BLANK: 1846066 Matrix: Water
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.3	11.0	04/09/19 04:47	
Calcium	ug/L	<69.8	250	04/09/19 04:47	

LABORATORY CONTROL SAMPLE: 1846067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	486	97	80-120	
Calcium	ug/L	5000	4990	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Boron	ug/L	26.9	500	492	498	93	94	75-125	1	20		
Calcium	ug/L	126000	5000	126000	123000	12	-46	75-125	2	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

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185521

QC Batch: 317813 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

METHOD BLANK: 1847582 Matrix: Water
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/09/19 12:32	

LABORATORY CONTROL SAMPLE: 1847583

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	552	96	80-120	

SAMPLE DUPLICATE: 1847584

Parameter	Units	40185256001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	462	0	5	

SAMPLE DUPLICATE: 1847585

Parameter	Units	40185260001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	290	284	2	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

QC Batch: 317736 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

SAMPLE DUPLICATE: 1847351

Parameter	Units	40185260001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	20	H6

SAMPLE DUPLICATE: 1847381

Parameter	Units	40185339014 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.7	7.7	0	20	H6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185521

QC Batch: 318035 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

METHOD BLANK: 1848956 Matrix: Water
Associated Lab Samples: 40185260005, 40185260006, 40185260007, 40185260008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	04/15/19 11:11	
Fluoride	mg/L	<0.10	0.30	04/15/19 11:11	
Sulfate	mg/L	<1.0	3.0	04/15/19 11:11	

LABORATORY CONTROL SAMPLE: 1848957

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	21.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848958 1848959

Parameter	Units	40185548003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	261	200	200	438	463	88	101	90-110	6	15	M0
Fluoride	mg/L	<1.0	20	20	18.0	19.8	90	99	90-110	9	15	
Sulfate	mg/L	54.2	200	200	232	252	89	99	90-110	8	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848960 1848961

Parameter	Units	40185308003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	106	200	200	313	318	104	106	90-110	1	15	
Fluoride	mg/L	<1.0	20	20	20.6	21.5	103	108	90-110	4	15	
Sulfate	mg/L	94.8	200	200	298	309	102	107	90-110	3	15	

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QUALIFIERS

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185521

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40185260005	MW-309	EPA 3010	317485	EPA 6020	317570
40185260006	MW-310	EPA 3010	317485	EPA 6020	317570
40185260007	MW-311	EPA 3010	317485	EPA 6020	317570
40185260008	FIELD BLANK MOD4	EPA 3010	317485	EPA 6020	317570
40185260005	MW-309				
40185260006	MW-310				
40185260007	MW-311				
40185260005	MW-309	SM 2540C	317813		
40185260006	MW-310	SM 2540C	317813		
40185260007	MW-311	SM 2540C	317813		
40185260008	FIELD BLANK MOD4	SM 2540C	317813		
40185260005	MW-309	EPA 9040	317736		
40185260006	MW-310	EPA 9040	317736		
40185260007	MW-311	EPA 9040	317736		
40185260008	FIELD BLANK MOD4	EPA 9040	317736		
40185260005	MW-309	EPA 300.0	318035		
40185260006	MW-310	EPA 300.0	318035		
40185260007	MW-311	EPA 300.0	318035		
40185260008	FIELD BLANK MOD4	EPA 300.0	318035		

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(Please Print Clearly)

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

Page 1 of 2



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MW

CHAIN OF CUSTODY

A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
 H= Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other
 *Preservation Codes

4085260

Company Name: **SCS**

Branch/Location: **Madison WI**

Project Contact: **Mrs Blockett**

Phone: **608-210-7302**

Project Number: **25219D67**

Project Name: **Alliant - Columbia**

Project State: **WI**

Sampled By (Print): **Adam Watson**

Sampled By (Sign): **Paul A. Brown for Adam Watson**

PO #: _____

Regulatory Program: _____

Matrix Codes

A = Air
 B = Biota
 C = Charcoal
 O = Oil
 S = Soil
 Sl = Sludge
 W = Water
 DW = Drinking Water
 G = Ground Water
 SW = Surface Water
 WP = Waste Water

Y/N	Pick Letter	ANALYSES REQUESTED
N/A	A	TDS, SO4, PH
N/A	A	Fluoride, CL
N/A	D	Ca, B

Quote #: _____

Mail To Contact: _____

Mail To Company: _____

Mail To Address: _____

Invoice To Contact: _____

Invoice To Company: _____

Invoice To Address: _____

Invoice To Phone: _____

CLIENT COMMENTS: _____

LAB COMMENTS (Lab Use Only): _____

Profile #: _____

PAGE LAB #	CLIENT FIELD ID	DATE	COLLECTION TIME	MATRIX	ANALYSES REQUESTED	Data Package Options		MS/MSD		Relinquished By:	Date/Time:	Received By:	Date/Time:
						(billable)	(billable)	(billable)	(billable)				
001	MW 302	4-2-19	16:35	GW	X	X	<input type="checkbox"/> EPA Level III	<input type="checkbox"/> On your sample	<input type="checkbox"/> NOT needed on your sample	Paul A. Brown	4-3-19	18:30	4-18-19
002	MW 33AR	4-2-19	15:30	↓	X	X	<input type="checkbox"/> EPA Level IV	<input type="checkbox"/> On your sample	<input type="checkbox"/> NOT needed on your sample	Paul A. Brown	4-4-19	0930	4-18-19
003	MW 34A	4-2-19	14:30	↓									
004	Field Blank Mod 1	4-2-19	16:35	OT									
005	MW 3D9	4-2-19	9:10	GW									
006	MW 31D	4-2-19	9:55	↓									
007	MW 311	4-2-19	10:50	↓									
008	Field Blank Mod 4	4-2-19	9:55	DI									
009	MW 3D6	4-1-19	18:15	GW									
010	MW 304	4-1-19	17:35	↓									
011	MW 308	4-1-19	16:50	↓									
012	Field Blank SCBnd 4-1-19	4-1-19	16:50	DI									
013	4/1/19 SW												

PACE Project No. **40185260**

Receipt Temp = **ROT** °C

Sample Receipt pH **OK** Adjusted

Cooler Custody Seal **Present / Not Present**

Intact / Not Intact

Sample Preservation Receipt Form

Client Name: SCS Project # 40185260


All containers needing preservation have been checked and noted below: Yes No N/A
 Lab Lot# of pH paper: 10453581 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: SKW 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)						
													BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N
001												2.5 / 5 / 10						
002										X		2.5 / 5 / 10						
003										X		2.5 / 5 / 10						
004										X		2.5 / 5 / 10						
005										X		2.5 / 5 / 10						
006										X		2.5 / 5 / 10						
007										X		2.5 / 5 / 10						
008										X		2.5 / 5 / 10						
009										X		2.5 / 5 / 10						
010										X		2.5 / 5 / 10						
011										X		2.5 / 5 / 10						
012										X		2.5 / 5 / 10						
013										X		2.5 / 5 / 10						
014										X		2.5 / 5 / 10						
015										X		2.5 / 5 / 10						
016										X		2.5 / 5 / 10						
017										X		2.5 / 5 / 10						
018										X		2.5 / 5 / 10						
019										X		2.5 / 5 / 10						
020										X		2.5 / 5 / 10						

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	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN:
1 liter amber glass	1 liter amber glass HCL	125 ml amber glass H2SO4	120 ml amber glass unpres	100 ml amber glass unpres	500 ml amber glass H2SO4	250 ml clear glass unpres	1 liter plastic unpres	500 ml plastic HNO3	500 ml plastic NaOH, Znact	250 ml plastic unpres	250 ml plastic NaOH	250 ml plastic HNO3	250 ml plastic H2SO4	40 ml amber ascorbic	40 ml clear vial Na Thio	40 ml clear vial unpres	40 ml clear vial HCL	40 ml clear vial MeOH	40 ml clear vial DI	4 oz amber jar unpres	4 oz clear jar unpres	4 oz plastic jar unpres	120 ml plastic Na Thiosulfate	ziploc bag	

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: _____

Client Name: SCS

WO#: **40185260**

Courier: CS Logistics Fed Ex Speedee UPS Walco

Client Pace Other: _____



Tracking #: 786437200524

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 - N/A Type of Ice: Wet Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROT / Corr: _____

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

Person examining contents:
 Date: 4-4-19
 Initials: SLU

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

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>No pg#, mail, Invoice</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.
- 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.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
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>004-ID is Field Blank MOD 134 F</u> <u>009 - No date + time on 250mlp 4</u> <u>4-4-19</u> <u>SN</u>
-Includes date/time/ID/Analysis Matrix: _____		
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: _____

Project Manager Review: AL for DM Date: 4/4/19

May 03, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Revised Report: Anions for MW-301 were reanalyzed at a lesser dilution.

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: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

Pennsylvania Certification IDs

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

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Green Bay Certification IDs

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

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

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SAMPLE SUMMARY

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40185256001	MW-301	Water	04/02/19 17:20	04/04/19 09:30
40185256002	MW-84A	Water	04/03/19 09:40	04/04/19 09:30

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SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40185256001	MW-301	EPA 6020	KXS	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			AXL	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40185256002	MW-84A	EPA 6020	KXS
EPA 7470	AJT			1	PASI-G
	AXL			7	PASI-G
EPA 903.1	MK1			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	TMK			1	PASI-G
EPA 9040	ALY			1	PASI-G
EPA 300.0	HMB			3	PASI-G

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Sample: MW-301 Lab ID: 40185256001 Collected: 04/02/19 17:20 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	0.32J	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:15	7440-36-0	
Arsenic	0.40J	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 06:15	7440-38-2	
Barium	11.8	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 06:15	7440-39-3	
Beryllium	0.28J	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 06:15	7440-41-7	
Boron	26.9	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 06:15	7440-42-8	
Cadmium	0.21J	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:15	7440-43-9	
Calcium	126000	ug/L	2500	698	10	04/05/19 08:40	04/09/19 05:48	7440-70-2	P6
Chromium	<1.0	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 06:15	7440-47-3	
Cobalt	0.35J	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 06:15	7440-48-4	
Lead	0.30J	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 06:15	7439-92-1	
Lithium	0.90J	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 06:15	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 06:15	7439-98-7	
Selenium	0.49J	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 06:15	7782-49-2	
Thallium	0.48J	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 06:15	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.084	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:05	7439-97-6	
Field Data		Analytical Method:							
Field pH	6.62	Std. Units			1		04/02/19 17:20		
Field Specific Conductance	883	umhos/cm			1		04/02/19 17:20		
Oxygen, Dissolved	2.20	mg/L			1		04/02/19 17:20	7782-44-7	
REDOX	152.1	mV			1		04/02/19 17:20		
Turbidity	2.02	NTU			1		04/02/19 17:20		
Static Water Level	787.04	feet			1		04/02/19 17:20		
Temperature, Water (C)	7.5	deg C			1		04/02/19 17:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	462	mg/L	20.0	8.7	1		04/09/19 12:34		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	6.8	Std. Units	0.10	0.010	1		04/08/19 11:21		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	0.79J	mg/L	2.0	0.50	1		04/30/19 11:06	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		04/30/19 11:06	16984-48-8	
Sulfate	4.4	mg/L	3.0	1.0	1		04/30/19 11:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA CCR

Sample Project No.: 40185256

Sample: MW-84A **Lab ID: 40185256002** Collected: 04/03/19 09:40 Received: 04/04/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:42	7440-36-0	
Arsenic	<0.28	ug/L	1.0	0.28	1	04/05/19 08:40	04/09/19 06:42	7440-38-2	
Barium	14.7	ug/L	4.9	1.5	1	04/05/19 08:40	04/09/19 06:42	7440-39-3	
Beryllium	<0.18	ug/L	1.0	0.18	1	04/05/19 08:40	04/09/19 06:42	7440-41-7	
Boron	13.6	ug/L	11.0	3.3	1	04/05/19 08:40	04/09/19 06:42	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	04/05/19 08:40	04/09/19 06:42	7440-43-9	
Calcium	80100	ug/L	250	69.8	1	04/05/19 08:40	04/09/19 06:42	7440-70-2	
Chromium	1.8J	ug/L	3.4	1.0	1	04/05/19 08:40	04/09/19 06:42	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	04/05/19 08:40	04/09/19 06:42	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	04/05/19 08:40	04/09/19 06:42	7439-92-1	
Lithium	0.56J	ug/L	1.0	0.19	1	04/05/19 08:40	04/09/19 06:42	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	04/05/19 08:40	04/09/19 06:42	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	04/05/19 08:40	04/09/19 06:42	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	04/05/19 08:40	04/09/19 06:42	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.084	ug/L	0.28	0.084	1	04/12/19 09:55	04/15/19 10:07	7439-97-6	
Field Data		Analytical Method:							
Field pH	7.03	Std. Units			1		04/03/19 09:40		
Field Specific Conductance	637.2	umhos/cm			1		04/03/19 09:40		
Oxygen, Dissolved	9.49	mg/L			1		04/03/19 09:40	7782-44-7	
REDOX	103.4	mV			1		04/03/19 09:40		
Turbidity	1.90	NTU			1		04/03/19 09:40		
Static Water Level	787.35	feet			1		04/03/19 09:40		
Temperature, Water (C)	10.2	deg C			1		04/03/19 09:40		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	318	mg/L	20.0	8.7	1		04/09/19 12:34		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	7.4	Std. Units	0.10	0.010	1		04/08/19 11:24		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	3.6	mg/L	2.0	0.50	1		04/16/19 20:03	16887-00-6	B
Fluoride	<0.10	mg/L	0.30	0.10	1		04/16/19 20:03	16984-48-8	
Sulfate	1.4J	mg/L	3.0	1.0	1		04/16/19 20:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

QC Batch: 318138

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1849587

Matrix: Water

Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	04/15/19 09:25	

LABORATORY CONTROL SAMPLE: 1849588

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.3	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1849589 1849590

Parameter	Units	40185483005 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury	ug/L	0.00016J mg/L	5	5	5.4	5.2	105	101	85-115	4	20

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317485 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1846066 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	04/09/19 04:47	
Arsenic	ug/L	<0.28	1.0	04/09/19 04:47	
Barium	ug/L	<1.5	4.9	04/09/19 04:47	
Beryllium	ug/L	<0.18	1.0	04/09/19 04:47	
Boron	ug/L	<3.3	11.0	04/09/19 04:47	
Cadmium	ug/L	<0.15	1.0	04/09/19 04:47	
Calcium	ug/L	<69.8	250	04/09/19 04:47	
Chromium	ug/L	<1.0	3.4	04/09/19 04:47	
Cobalt	ug/L	<0.12	1.0	04/09/19 04:47	
Lead	ug/L	<0.24	1.0	04/09/19 04:47	
Lithium	ug/L	<0.19	1.0	04/09/19 04:47	
Molybdenum	ug/L	<0.44	1.5	04/09/19 04:47	
Selenium	ug/L	<0.32	1.1	04/09/19 04:47	
Thallium	ug/L	<0.14	1.0	04/09/19 04:47	

LABORATORY CONTROL SAMPLE: 1846067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	500	100	80-120	
Arsenic	ug/L	500	474	95	80-120	
Barium	ug/L	500	487	97	80-120	
Beryllium	ug/L	500	492	98	80-120	
Boron	ug/L	500	486	97	80-120	
Cadmium	ug/L	500	500	100	80-120	
Calcium	ug/L	5000	4990	100	80-120	
Chromium	ug/L	500	492	98	80-120	
Cobalt	ug/L	500	485	97	80-120	
Lead	ug/L	500	463	93	80-120	
Lithium	ug/L	500	467	93	80-120	
Molybdenum	ug/L	500	465	93	80-120	
Selenium	ug/L	500	508	102	80-120	
Thallium	ug/L	500	464	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068 1846069

Parameter	Units	40185256001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
			Spike Conc.	Spike Conc.							
Antimony	ug/L	0.32J	500	500	496	496	99	99	75-125	0	20

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1846068		1846069		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		40185256001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Arsenic	ug/L	0.40J	500	500	480	478	96	95	75-125	0	20		
Barium	ug/L	11.8	500	500	496	498	97	97	75-125	0	20		
Beryllium	ug/L	0.28J	500	500	481	480	96	96	75-125	0	20		
Boron	ug/L	26.9	500	500	492	498	93	94	75-125	1	20		
Cadmium	ug/L	0.21J	500	500	491	490	98	98	75-125	0	20		
Calcium	ug/L	126000	5000	5000	126000	123000	12	-46	75-125	2	20	P6	
Chromium	ug/L	<1.0	500	500	484	483	97	96	75-125	0	20		
Cobalt	ug/L	0.35J	500	500	476	473	95	95	75-125	1	20		
Lead	ug/L	0.30J	500	500	467	468	93	94	75-125	0	20		
Lithium	ug/L	0.90J	500	500	463	463	92	92	75-125	0	20		
Molybdenum	ug/L	<0.44	500	500	465	464	93	93	75-125	0	20		
Selenium	ug/L	0.49J	500	500	512	513	102	103	75-125	0	20		
Thallium	ug/L	0.48J	500	500	474	476	95	95	75-125	0	20		

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317813 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1847582 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/09/19 12:32	

LABORATORY CONTROL SAMPLE: 1847583

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	577	552	96	80-120	

SAMPLE DUPLICATE: 1847584

Parameter	Units	40185256001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	462	0	5	

SAMPLE DUPLICATE: 1847585

Parameter	Units	40185260001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	290	284	2	5	

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

QC Batch: 317619 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 40185256001, 40185256002

SAMPLE DUPLICATE: 1846956

Parameter	Units	40185113001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	1.1	1.1	7	20	H6

SAMPLE DUPLICATE: 1846957

Parameter	Units	40185204001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	20	H6

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

QC Batch: 317955 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1848305 Matrix: Water
Associated Lab Samples: 40185256001, 40185256002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	0.52J	2.0	04/16/19 10:22	
Fluoride	mg/L	<0.10	0.30	04/16/19 10:22	
Sulfate	mg/L	<1.0	3.0	04/16/19 10:22	

LABORATORY CONTROL SAMPLE: 1848306

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	21.6	108	90-110	
Fluoride	mg/L	2	2.0	98	90-110	
Sulfate	mg/L	20	21.7	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848307 1848308

Parameter	Units	40185204004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	43.0	100	100	149	148	106	105	90-110	1	15	
Fluoride	mg/L	<0.50	10	10	10.3	10.4	103	104	90-110	1	15	
Sulfate	mg/L	<5.0	100	100	109	109	105	105	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1848309 1848310

Parameter	Units	40185260002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Chloride	mg/L	229	200	200	439	425	105	98	90-110	3	15	
Fluoride	mg/L	<0.10	2	2	1.9	2.0	97	99	90-110	2	15	
Sulfate	mg/L	201	200	200	411	397	105	98	90-110	3	15	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Sample: MW-301		Lab ID: 40185256001	Collected: 04/02/19 17:20	Received: 04/04/19 09:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.278	(0.565)	pCi/L	04/22/19 23:16	13982-63-3	
		C:NA T:94%					
Radium-228	EPA 904.0	0.552 ± 0.391	(0.759)	pCi/L	04/19/19 12:45	15262-20-1	
		C:75% T:91%					
Total Radium	Total Radium Calculation	0.552 ± 0.669	(1.32)	pCi/L	04/25/19 11:01	7440-14-4	

Sample: MW-84A		Lab ID: 40185256002	Collected: 04/03/19 09:40	Received: 04/04/19 09:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.199 ± 0.391	(0.715)	pCi/L	04/22/19 23:16	13982-63-3	
		C:NA T:93%					
Radium-228	EPA 904.0	0.482 ± 0.511	(1.07)	pCi/L	04/19/19 12:45	15262-20-1	
		C:72% T:80%					
Total Radium	Total Radium Calculation	0.681 ± 0.902	(1.79)	pCi/L	04/25/19 11:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

QC Batch: 338211

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1646527

Matrix: Water

Associated Lab Samples: 40185256001, 40185256002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0681 ± 0.343 (0.816) C:74% T:84%	pCi/L	04/19/19 12:45	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

QC Batch: 338210

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 40185256001, 40185256002

METHOD BLANK: 1646526

Matrix: Water

Associated Lab Samples: 40185256001, 40185256002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.212 ± 0.323 (0.520) C:NA T:90%	pCi/L	04/22/19 22:44	

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QUALIFIERS

Project: 25219067 ALLIANT-COLUMBIA CCR
Pace Project No.: 40185256

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.

LABORATORIES

PASI-G Pace Analytical Services - Green Bay

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 ALLIANT-COLUMBIA CCR

Pace Project No.: 40185256

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40185256001	MW-301	EPA 3010	317485	EPA 6020	317570
40185256002	MW-84A	EPA 3010	317485	EPA 6020	317570
40185256001	MW-301	EPA 7470	318138	EPA 7470	318191
40185256002	MW-84A	EPA 7470	318138	EPA 7470	318191
40185256001	MW-301				
40185256002	MW-84A				
40185256001	MW-301	EPA 903.1	338210		
40185256002	MW-84A	EPA 903.1	338210		
40185256001	MW-301	EPA 904.0	338211		
40185256002	MW-84A	EPA 904.0	338211		
40185256001	MW-301	Total Radium Calculation	339896		
40185256002	MW-84A	Total Radium Calculation	339897		
40185256001	MW-301	SM 2540C	317813		
40185256002	MW-84A	SM 2540C	317813		
40185256001	MW-301	EPA 9040	317619		
40185256002	MW-84A	EPA 9040	317619		
40185256001	MW-301	EPA 300.0	317955		
40185256002	MW-84A	EPA 300.0	317955		

REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

UPPER MIDWEST REGION

Page 1 of

MN: 612-607-1700 WI: 920-469-2436



WYH

40185256

CHAIN OF CUSTODY

Preservation Codes
 A=None B=HCL C=H2SO4 D=HNO3 E=D Water F=Methanol G=NaOH
 H=Sodium Glutarate Solution I=Sodium Thiosulfate J=Other

Company Name: **SCS**
 Branch/Location: **Madison, WI**
 Project Contact: **Mog Budget**
 Phone: **608 216 7362**
 Project Number: **85219067**
 Project Name: **Alliant - Columbia**
 Project State: **WI**
 Sampled By (Print): **Adam Watson**
 Sampled By (Sign): **Paul A. Brown for Adam Watson**
 PO #: _____
 Regulatory Program: _____

Data Package Options (billable)
 EPA Level III
 EPA Level IV
 On your sample (billable)
 NOT needed on your sample

Matrix Codes
 A = Air
 B = Biota
 C = Charcoal
 O = Oil
 S = Soil
 SI = Sludge
 W = Water
 DW = Drinking Water
 GW = Ground Water
 SW = Surface Water
 WW = Waste Water
 WP = Wastewater

PAGE LAB #	CLIENT FIELD ID	DATE	COLLECTION TIME	ANALYSES REQUESTED
001	MW 301	4/3/19	1730 W	Cl, Fluoride, Ph, 504, TDS
002	MW 84A	4/3/19	0940	Metals
003	MW 303	4/1/19	1800	Radium 226
004	MW 304	4/2/19	1230	Radium 228
005	MW 305	4/1/19	1410	
006	M-4R	4/1/19	1515	
007	Field Blank Pond	4/2/19	1230	

filled in by Lab from labels 4/4/19

Rush Turnaround Time Requested - Prelims (Rush TAT subject to approval/surcharge)
 Date Needed: _____
 Transmit Prelim Rush Results by (complete what you want):
 Email #1: _____
 Email #2: _____
 Telephone: _____
 Fax: _____

Relinquished By: **Paul A. Brown** Date/Time: **4-3-19 19:00**
 Relinquished By: **Fred S** Date/Time: **4/4/19 0930**
 Relinquished By: _____ Date/Time: _____
 Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____

Quote #: _____
 Mail To Contact: _____
 Mail To Company: _____
 Mail To Address: _____
 Invoice To Contact: _____
 Invoice To Company: _____
 Invoice To Address: _____
 Invoice To Phone: _____
 CLIENT COMMENTS: _____
 LAB COMMENTS (Lab Use Only): _____
 Profile #: _____

(Please Print Clearly)

Company Name: SCS
 Branch/Location: Madison WI
 Project Contact: Meg Blodgett
 Phone: 608 216 7362
 Project Number: 85219067
 Project Name: Alliant - Columbia
 Project State: WI
 Sampled By (Print): Adam Watson
 Sampled By (Sign): Adam Watson
 PO #: _____



CHAIN OF CUSTODY

As-Nrme B-HCl C-H2SO4
 H-Sodium Bisulfate Solution I-Sodium Thiosulfate
 T-Transmission Codes
 D-HNO3 E-DI Water F-Methanol G-NaOH
 J-Other

UPPER MIDWEST REGION
 MN: 612-607-1700 WI: 920-469-2436

Page 1 of 1
 40185256

PAGE LAB #	CLIENT FIELD ID	COLLECTION DATE	TIME	MATRIX	Analyses Requested			
					VIB	Pick Label	CL	Fluoride, Ph, 504, TDS
MW 301		4-21-19	17:20	GW	X	X	X	X
MW 94A		4-21-19	9:44	GW	X	X	X	X
MW 303		4-1-19	18:00	GW	X	X	X	X
MW 304		4-2-19	18:30		X	X	X	X
MW 305		4-1-19	14:10		X	X	X	X
M-4R		4-1-19	15:15		X	X	X	X
FIELD Blank Pond		4-21-19	12:30	DI	X	X	X	X

Retention Time Requested - Prelims (Rush TAT subject to approval/surcharge)
 Date Needed: _____

Transit Prelim Rush Results by (complete what you want):
 Email #1: _____
 Email #2: _____
 Telephone: _____
 Fax: _____

Requisitioned By: _____ Date/Time: _____
 Requisitioned By: _____ Date/Time: _____
 Requisitioned By: _____ Date/Time: _____

Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____
 Received By: _____ Date/Time: _____

Special pricing and release of liability

Version 6.0 06/17/05 ORIGINAL

Quote #:
 Mail To Contact:
 Mail To Company:
 Mail To Address:
 Invoice To Contact:
 Invoice To Company:
 Invoice To Address:
 Invoice To Phone:
 CLIENT COMMENTS
 LAB COMMENTS (Lab Use Only)
 Profile #

PAGE Project No. 40185256
 Receipt Temp = _____ °C
 Sample Receipt pH _____
 Cooler Custody Seal Present / Not Present
 Intact / Not Intact

Sample Preservation Receipt Form

Client Name: SCS

Project # 40185256

All containers needing preservation have been checked and noted below:

Lab Lot# of pH paper: 1045358

Yes No N/A

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

Initial when completed: SKW

Date/Time:

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 81
Green Bay, WI 54302

Pace Lab #	AG1U AG1H AG4S AG4U AG5U AG2S BG3U	BP1U BP2N BP2Z BP3U BP3C BP3N BP3S	DG9A DG9T VG9U VG9H VG9M VG9D	JGFU WGFU WPFU	SP5T ZPLC GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001												2.5 / 5 / 10
002												2.5 / 5 / 10
003												2.5 / 5 / 10
004												2.5 / 5 / 10
005												2.5 / 5 / 10
006												2.5 / 5 / 10
007												2.5 / 5 / 10
008												2.5 / 5 / 10
009												2.5 / 5 / 10
010												2.5 / 5 / 10
011												2.5 / 5 / 10
012												2.5 / 5 / 10
013												2.5 / 5 / 10
014												2.5 / 5 / 10
015												2.5 / 5 / 10
016												2.5 / 5 / 10
017												2.5 / 5 / 10
018												2.5 / 5 / 10
019												2.5 / 5 / 10
020												2.5 / 5 / 10

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

AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3C	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN:
1 liter amber glass	1 liter amber glass HCL	125 ml amber glass H2SO4	120 ml amber glass unpres	100 ml amber glass unpres	500 ml clear glass unpres	250 ml clear glass unpres	1 liter plastic unpres	500 ml plastic HNO3	500 ml plastic NaOH, Znact	250 ml plastic unpres	250 ml plastic NaOH	250 ml plastic HNO3	250 ml plastic H2SO4	40 ml amber ascorbic	40 ml amber Na Thio	40 ml clear vial unpres	40 ml clear vial HCL	40 ml clear vial MeOH	40 ml clear vial DI	4 oz amber jar unpres	4 oz clear jar unpres	4 oz plastic jar unpres	120 ml plastic Na Thiosulfate	ziploc bag	



1241 Bellevue Street, Green Bay, WI 54302

Document Name:
Sample Condition Upon Receipt (SCUR)

Document Revised: 25Apr2018

Document No.:
F-GB-C-031-Rev.07

Issuing Authority:
Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name:

SCS

WO#: **40185256**

Courier: CS Logistics Fed Ex Speedee UPS Walto

Client Pace Other: _____



Tracking #: 7864 3720 0524

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 - N/A Type of Ice: Wet Blue Dry None

Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROI / Corr: _____

Temp Blank Present: yes no

Biological Tissue is Frozen: yes no

Person examining contents:

Date: 4-4-19

Initials: SKW

Temp should be above freezing to 6°C.

Biota Samples may be received at ≤ 0°C.

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>No pg # Mail Invoice Collected 4-4-19</u>
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. <u>date & time Lab added to COC</u>
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4. <u>Received updated COC via email from client 4-4-19</u>
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- 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.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
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: _____

Project Manager Review:

AK for DM

Date:

4/4/19

A2 October 2019 Detection Monitoring

October 28, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40197016

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Green Bay Certification IDs

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

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SAMPLE SUMMARY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40197016

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40196971005	MW-309	Water	10/08/19 11:50	10/10/19 09:15
40196971006	MW-310	Water	10/08/19 12:50	10/10/19 09:15
40196971007	MW-311	Water	10/08/19 13:40	10/10/19 09:15
40196971008	FIELD BLANK MOD 4	Water	10/08/19 11:50	10/10/19 09:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40196971005	MW-309	EPA 6020	DS1	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40196971006	MW-310	EPA 6020	DS1	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40196971007	MW-311	EPA 6020	DS1	2
			HMG	7
		SM 2540C	TMK	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40196971008	FIELD BLANK MOD 4	EPA 6020	DS1	2
			SM 2540C	TMK
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Sample: MW-309 **Lab ID: 40196971005** Collected: 10/08/19 11:50 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Boron	33.4	ug/L	10.0	3.0	1	10/11/19 07:55	10/15/19 10:59	7440-42-8	
Calcium	46900	ug/L	254	76.2	1	10/11/19 07:55	10/15/19 10:59	7440-70-2	
Field Data		Analytical Method:							
Field pH	7.75	Std. Units			1		10/08/19 11:50		
Field Specific Conductance	687	umhos/cm			1		10/08/19 11:50		
Oxygen, Dissolved	11.52	mg/L			1		10/08/19 11:50	7782-44-7	
REDOX	125.2	mV			1		10/08/19 11:50		
Turbidity	4.89	NTU			1		10/08/19 11:50		
Static Water Level	787.26	feet			1		10/08/19 11:50		
Temperature, Water (C)	13.0	deg C			1		10/08/19 11:50		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	370	mg/L	20.0	8.7	1		10/11/19 18:21		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	7.7	Std. Units	0.10	0.010	1		10/18/19 09:58		H6
300.0 IC Anions		Analytical Method: EPA 300.0							
Chloride	43.2	mg/L	2.0	0.50	1		10/21/19 20:25	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 20:25	16984-48-8	
Sulfate	21.9	mg/L	3.0	1.0	1		10/21/19 20:25	14808-79-8	

Sample: MW-310 **Lab ID: 40196971006** Collected: 10/08/19 12:50 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Boron	81.8	ug/L	10.0	3.0	1	10/11/19 07:55	10/15/19 11:06	7440-42-8	
Calcium	57600	ug/L	254	76.2	1	10/11/19 07:55	10/15/19 11:06	7440-70-2	
Field Data		Analytical Method:							
Field pH	7.82	Std. Units			1		10/08/19 12:50		
Field Specific Conductance	1226	umhos/cm			1		10/08/19 12:50		
Oxygen, Dissolved	11.57	mg/L			1		10/08/19 12:50	7782-44-7	
REDOX	139.4	mV			1		10/08/19 12:50		
Turbidity	2.66	NTU			1		10/08/19 12:50		
Static Water Level	787.94	feet			1		10/08/19 12:50		
Temperature, Water (C)	13.4	deg C			1		10/08/19 12:50		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	650	mg/L	20.0	8.7	1		10/11/19 18:21		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Sample: MW-310 Lab ID: 40196971006 Collected: 10/08/19 12:50 Received: 10/10/19 09:15 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
9040 pH Analytical Method: EPA 9040									
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		10/18/19 09:59		H6
300.0 IC Anions Analytical Method: EPA 300.0									
Chloride	190	mg/L	20.0	5.0	10		10/22/19 14:42	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 20:38	16984-48-8	
Sulfate	85.9	mg/L	30.0	10.0	10		10/22/19 14:42	14808-79-8	

Sample: MW-311 Lab ID: 40196971007 Collected: 10/08/19 13:40 Received: 10/10/19 09:15 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Boron	33.5	ug/L	10.0	3.0	1	10/11/19 07:55	10/15/19 11:13	7440-42-8	
Calcium	63900	ug/L	254	76.2	1	10/11/19 07:55	10/15/19 11:13	7440-70-2	
Field Data Analytical Method:									
Field pH	7.69	Std. Units			1		10/08/19 13:40		
Field Specific Conductance	495.6	umhos/cm			1		10/08/19 13:40		
Oxygen, Dissolved	11.68	mg/L			1		10/08/19 13:40	7782-44-7	
REDOX	144.3	mV			1		10/08/19 13:40		
Turbidity	8.56	NTU			1		10/08/19 13:40		
Static Water Level	787.64	feet			1		10/08/19 13:40		
Temperature, Water (C)	12.9	deg C			1		10/08/19 13:40		
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	272	mg/L	20.0	8.7	1		10/11/19 18:21		
9040 pH Analytical Method: EPA 9040									
pH at 25 Degrees C	7.6	Std. Units	0.10	0.010	1		10/18/19 10:01		H6
300.0 IC Anions Analytical Method: EPA 300.0									
Chloride	1.5J	mg/L	2.0	0.50	1		10/21/19 20:51	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 20:51	16984-48-8	
Sulfate	21.2	mg/L	3.0	1.0	1		10/21/19 20:51	14808-79-8	

Sample: FIELD BLANK MOD 4 Lab ID: 40196971008 Collected: 10/08/19 11:50 Received: 10/10/19 09:15 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010									
Boron	<3.0	ug/L	10.0	3.0	1	10/11/19 07:55	10/15/19 08:13	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	10/11/19 07:55	10/15/19 08:13	7440-70-2	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Sample: FIELD BLANK MOD 4 **Lab ID: 40196971008** Collected: 10/08/19 11:50 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<8.7	mg/L	20.0	8.7	1		10/11/19 18:21		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	5.7	Std. Units	0.10	0.010	1		10/18/19 10:08		H6
300.0 IC Anions		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	2.0	0.50	1		10/21/19 21:04	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 21:04	16984-48-8	
Sulfate	<1.0	mg/L	3.0	1.0	1		10/21/19 21:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40197016

QC Batch: 337095 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

METHOD BLANK: 1957892 Matrix: Water
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	10/15/19 07:53	
Calcium	ug/L	<76.2	254	10/15/19 07:53	

LABORATORY CONTROL SAMPLE: 1957893

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	474	95	80-120	
Calcium	ug/L	5000	5060	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1957894 1957895

Parameter	Units	40196734001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	7220	500	500	7950	8800	146	316	75-125	10	20	P6
Calcium	ug/L	87600	5000	5000	95700	98200	161	210	75-125	3	20	P6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40197016

QC Batch: 337218 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

METHOD BLANK: 1959158 Matrix: Water
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/11/19 18:18	

LABORATORY CONTROL SAMPLE: 1959159

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	547	560	102	80-120	

SAMPLE DUPLICATE: 1959160

Parameter	Units	40196967001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	574	564	2	10	

SAMPLE DUPLICATE: 1959161

Parameter	Units	40196971001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	274	278	1	10	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

QC Batch: 337952 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

SAMPLE DUPLICATE: 1962801

Parameter	Units	40196967002 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.

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40197016

QC Batch: 337822 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

METHOD BLANK: 1962191 Matrix: Water
Associated Lab Samples: 40196971005, 40196971006, 40196971007, 40196971008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	10/21/19 11:34	
Fluoride	mg/L	<0.10	0.30	10/21/19 11:34	
Sulfate	mg/L	<1.0	3.0	10/21/19 11:34	

LABORATORY CONTROL SAMPLE: 1962192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.1	101	90-110	
Fluoride	mg/L	2	2.0	102	90-110	
Sulfate	mg/L	20	20.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962193 1962194

Parameter	Units	40196954007		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	14.1	20	20	33.8	33.6	99	98	90-110	1	15		
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15		
Sulfate	mg/L	7.2	20	20	27.0	26.9	99	98	90-110	0	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962195 1962196

Parameter	Units	40196971011		MS		MSD		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result						
Chloride	mg/L	1.6J	20	20	20.9	21.3	97	99	90-110	2	15		
Fluoride	mg/L	<0.10	2	2	2.1	2.1	102	102	90-110	0	15		
Sulfate	mg/L	<1.0	20	20	20.6	20.4	102	101	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

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QUALIFIERS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE


Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40197016

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40196971005	MW-309	EPA 3010	337095	EPA 6020	337193
40196971006	MW-310	EPA 3010	337095	EPA 6020	337193
40196971007	MW-311	EPA 3010	337095	EPA 6020	337193
40196971008	FIELD BLANK MOD 4	EPA 3010	337095	EPA 6020	337193
40196971005	MW-309				
40196971006	MW-310				
40196971007	MW-311				
40196971005	MW-309	SM 2540C	337218		
40196971006	MW-310	SM 2540C	337218		
40196971007	MW-311	SM 2540C	337218		
40196971008	FIELD BLANK MOD 4	SM 2540C	337218		
40196971005	MW-309	EPA 9040	337952		
40196971006	MW-310	EPA 9040	337952		
40196971007	MW-311	EPA 9040	337952		
40196971008	FIELD BLANK MOD 4	EPA 9040	337952		
40196971005	MW-309	EPA 300.0	337822		
40196971006	MW-310	EPA 300.0	337822		
40196971007	MW-311	EPA 300.0	337822		
40196971008	FIELD BLANK MOD 4	EPA 300.0	337822		

REPORT OF LABORATORY ANALYSIS

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 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS Engineers Project #: **WO#: 40196971**

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

Tracking #: 2120-100919

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 plastic bag

Thermometer Used SR - NA Type of Ice: Ice Blue Dry None Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROT /Corr: _____

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.

Person examining contents:
Date: 10/10/19
Initials: JS

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.
- 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.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
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: _____

Project Manager Review: [Signature] Date: 10-10-19

November 01, 2019

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, SCS ENGINEERS
Jeff Maxted, ALLIANT ENERGY
Marc Morandi, ALLIANT ENERGY



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Pennsylvania Certification IDs

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

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Green Bay Certification IDs

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

Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

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SAMPLE SUMMARY

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40196970001	MW-301	Water	10/09/19 12:00	10/10/19 09:15
40196970002	MW-84A	Water	10/09/19 13:10	10/10/19 09:15

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
40196970001	MW-301	EPA 6020	DS1	14	PASI-G
		EPA 7470	AJT	1	PASI-G
			HMG	7	PASI-G
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C	TMK	1	PASI-G
		EPA 9040	ALY	1	PASI-G
		EPA 300.0	HMB	3	PASI-G
		40196970002	MW-84A	EPA 6020	DS1
EPA 7470	AJT			1	PASI-G
	HMG			7	PASI-G
EPA 903.1	MK1			1	PASI-PA
EPA 904.0	VAL			1	PASI-PA
Total Radium Calculation	CMC			1	PASI-PA
SM 2540C	TMK			1	PASI-G
EPA 9040	ALY			1	PASI-G
EPA 300.0	HMB			3	PASI-G

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

Sample: MW-301 **Lab ID: 40196970001** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:25	7440-36-0	
Arsenic	0.42J	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 12:57	7440-38-2	
Barium	10	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:25	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 12:57	7440-41-7	
Boron	35.9	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 12:57	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:25	7440-43-9	
Calcium	114000	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 12:57	7440-70-2	
Chromium	<1.0	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 12:57	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 12:57	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:25	7439-92-1	
Lithium	0.61J	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 12:57	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	10/14/19 07:07	10/14/19 23:25	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 12:57	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:25	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.084	ug/L	0.28	0.084	1	10/22/19 14:50	10/23/19 09:18	7439-97-6	
Field Data		Analytical Method:							
Field pH	6.67	Std. Units			1		10/09/19 12:00		
Field Specific Conductance	801	umhos/cm			1		10/09/19 12:00		
Oxygen, Dissolved	1.67	mg/L			1		10/09/19 12:00	7782-44-7	
REDOX	173.0	mV			1		10/09/19 12:00		
Turbidity	2.12	NTU			1		10/09/19 12:00		
Static Water Level	788.47	feet			1		10/09/19 12:00		
Temperature, Water (C)	11.3	deg C			1		10/09/19 12:00		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	418	mg/L	20.0	8.7	1		10/15/19 16:41		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	7.0	Std. Units	0.10	0.010	1		10/18/19 09:42		H6
300.0 IC Anions		Analytical Method: EPA 300.0							
Chloride	1.7J	mg/L	2.0	0.50	1		10/21/19 18:26	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 18:26	16984-48-8	
Sulfate	8.4	mg/L	3.0	1.0	1		10/21/19 18:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

Sample: MW-84A **Lab ID: 40196970002** Collected: 10/09/19 13:10 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS		Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	<0.15	ug/L	1.0	0.15	1	10/14/19 07:07	10/14/19 23:46	7440-36-0	
Arsenic	0.46J	ug/L	1.0	0.28	1	10/14/19 07:07	10/15/19 13:34	7440-38-2	
Barium	13.2	ug/L	2.3	0.70	1	10/14/19 07:07	10/14/19 23:46	7440-39-3	
Beryllium	<0.25	ug/L	1.0	0.25	1	10/14/19 07:07	10/15/19 13:34	7440-41-7	
Boron	12.0	ug/L	10.0	3.0	1	10/14/19 07:07	10/15/19 13:34	7440-42-8	
Cadmium	<0.15	ug/L	1.0	0.15	1	10/14/19 07:07	10/15/19 13:34	7440-43-9	
Calcium	73500	ug/L	254	76.2	1	10/14/19 07:07	10/15/19 13:34	7440-70-2	
Chromium	1.6J	ug/L	3.4	1.0	1	10/14/19 07:07	10/15/19 13:34	7440-47-3	
Cobalt	<0.12	ug/L	1.0	0.12	1	10/14/19 07:07	10/15/19 13:34	7440-48-4	
Lead	<0.24	ug/L	1.0	0.24	1	10/14/19 07:07	10/14/19 23:46	7439-92-1	
Lithium	0.52J	ug/L	1.0	0.22	1	10/14/19 07:07	10/15/19 13:34	7439-93-2	
Molybdenum	<0.44	ug/L	1.5	0.44	1	10/14/19 07:07	10/15/19 13:34	7439-98-7	
Selenium	<0.32	ug/L	1.1	0.32	1	10/14/19 07:07	10/15/19 13:34	7782-49-2	
Thallium	<0.14	ug/L	1.0	0.14	1	10/14/19 07:07	10/14/19 23:46	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.084	ug/L	0.28	0.084	1	10/22/19 14:50	10/23/19 09:25	7439-97-6	
Field Data		Analytical Method:							
Field pH	7.23	Std. Units			1		10/09/19 13:10		
Field Specific Conductance	614.1	umhos/cm			1		10/09/19 13:10		
Oxygen, Dissolved	11.36	mg/L			1		10/09/19 13:10	7782-44-7	
REDOX	181.7	mV			1		10/09/19 13:10		
Turbidity	2.41	NTU			1		10/09/19 13:10		
Static Water Level	787.79	feet			1		10/09/19 13:10		
Temperature, Water (C)	11.8	deg C			1		10/09/19 13:10		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	310	mg/L	20.0	8.7	1		10/15/19 16:41		
9040 pH		Analytical Method: EPA 9040							
pH at 25 Degrees C	7.5	Std. Units	0.10	0.010	1		10/18/19 09:44		H6
300.0 IC Anions		Analytical Method: EPA 300.0							
Chloride	3.9	mg/L	2.0	0.50	1		10/21/19 19:19	16887-00-6	
Fluoride	<0.10	mg/L	0.30	0.10	1		10/21/19 19:19	16984-48-8	
Sulfate	1.3J	mg/L	3.0	1.0	1		10/21/19 19:19	14808-79-8	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 338359 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1964880 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	<0.084	0.28	10/23/19 09:14	

LABORATORY CONTROL SAMPLE: 1964881

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.3	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1964882 1964883

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		40196970001	Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Mercury	ug/L	<0.084	5	5	5.1	5.0	101	100	85-115	1	20		

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337277 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1959950 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	10/14/19 18:40	
Arsenic	ug/L	<0.28	1.0	10/14/19 18:40	
Barium	ug/L	<0.70	2.3	10/14/19 18:40	
Beryllium	ug/L	<0.25	1.0	10/14/19 18:40	
Boron	ug/L	<3.0	10.0	10/14/19 18:40	
Cadmium	ug/L	<0.15	1.0	10/14/19 18:40	
Calcium	ug/L	<76.2	254	10/14/19 18:40	
Chromium	ug/L	<1.0	3.4	10/14/19 18:40	
Cobalt	ug/L	<0.12	1.0	10/14/19 18:40	
Lead	ug/L	<0.24	1.0	10/14/19 18:40	
Lithium	ug/L	<0.22	1.0	10/14/19 18:40	
Molybdenum	ug/L	<0.44	1.5	10/14/19 18:40	
Selenium	ug/L	<0.32	1.1	10/14/19 18:40	
Thallium	ug/L	<0.14	1.0	10/14/19 18:40	

LABORATORY CONTROL SAMPLE: 1959951

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	497	99	80-120	
Arsenic	ug/L	500	478	96	80-120	
Barium	ug/L	500	477	95	80-120	
Beryllium	ug/L	500	488	98	80-120	
Boron	ug/L	500	464	93	80-120	
Cadmium	ug/L	500	501	100	80-120	
Calcium	ug/L	5000	5080	102	80-120	
Chromium	ug/L	500	478	96	80-120	
Cobalt	ug/L	500	467	93	80-120	
Lead	ug/L	500	470	94	80-120	
Lithium	ug/L	500	477	95	80-120	
Molybdenum	ug/L	500	452	90	80-120	
Selenium	ug/L	500	494	99	80-120	
Thallium	ug/L	500	476	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1959952 1959953

Parameter	Units	40196861005 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	ug/L	<0.15	500	500	513	510	103	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

Parameter	Units	1959952		1959953		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40196861005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Arsenic	ug/L	2.4	500	500	512	504	102	100	75-125	2	20		
Barium	ug/L	169	500	500	671	672	100	101	75-125	0	20		
Beryllium	ug/L	<0.25	500	500	513	469	103	94	75-125	9	20		
Boron	ug/L	73.0	500	500	582	529	102	91	75-125	10	20		
Cadmium	ug/L	<0.15	500	500	514	512	103	102	75-125	0	20		
Calcium	ug/L	90300	5000	5000	96800	99900	130	192	75-125	3	20	P6	
Chromium	ug/L	<1.0	500	500	492	486	98	97	75-125	1	20		
Cobalt	ug/L	<0.12	500	500	488	484	98	97	75-125	1	20		
Lead	ug/L	<0.24	500	500	489	489	98	98	75-125	0	20		
Lithium	ug/L	12.4	500	500	518	476	101	93	75-125	8	20		
Molybdenum	ug/L	2.6	500	500	477	476	95	95	75-125	0	20		
Selenium	ug/L	<0.32	500	500	524	521	105	104	75-125	1	20		
Thallium	ug/L	<0.14	500	500	502	502	100	100	75-125	0	20		

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

QC Batch: 337571

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1960873

Matrix: Water

Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/15/19 16:39	

LABORATORY CONTROL SAMPLE: 1960874

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	547	558	102	80-120	

SAMPLE DUPLICATE: 1960875

Parameter	Units	40196939001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	354	368	4	10	

SAMPLE DUPLICATE: 1960876

Parameter	Units	40196970001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	418	406	3	10	

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

QC Batch: 337952 Analysis Method: EPA 9040

QC Batch Method: EPA 9040 Analysis Description: 9040 pH

Associated Lab Samples: 40196970001, 40196970002

SAMPLE DUPLICATE: 1962801

Parameter	Units	40196967002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	20	H6

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QUALITY CONTROL DATA

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

QC Batch: 337822 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1962191 Matrix: Water
Associated Lab Samples: 40196970001, 40196970002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.50	2.0	10/21/19 11:34	
Fluoride	mg/L	<0.10	0.30	10/21/19 11:34	
Sulfate	mg/L	<1.0	3.0	10/21/19 11:34	

LABORATORY CONTROL SAMPLE: 1962192

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.1	101	90-110	
Fluoride	mg/L	2	2.0	102	90-110	
Sulfate	mg/L	20	20.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962193 1962194

Parameter	Units	40196954007		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Chloride	mg/L	14.1	20	20	20	33.8	33.6	99	98	90-110	1	15	
Fluoride	mg/L	<0.10	2	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	7.2	20	20	20	27.0	26.9	99	98	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1962195 1962196

Parameter	Units	40196971011		MS		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec				
Chloride	mg/L	1.6J	20	20	20	20.9	21.3	97	99	90-110	2	15	
Fluoride	mg/L	<0.10	2	2	2	2.1	2.1	102	102	90-110	0	15	
Sulfate	mg/L	<1.0	20	20	20	20.6	20.4	102	101	90-110	1	15	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

Sample: MW-301		Lab ID: 40196970001	Collected: 10/09/19 12:00	Received: 10/10/19 09:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.252 ± 0.351 (0.585)		pCi/L	10/31/19 12:20	13982-63-3	
		C:NA T:83%					
Radium-228	EPA 904.0	0.449 ± 0.363 (0.723)		pCi/L	10/30/19 14:23	15262-20-1	
		C:77% T:95%					
Total Radium	Total Radium Calculation	0.701 ± 0.714 (1.31)		pCi/L	11/01/19 15:00	7440-14-4	

Sample: MW-84A		Lab ID: 40196970002	Collected: 10/09/19 13:10	Received: 10/10/19 09:15	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.247 ± 0.292 (0.459)		pCi/L	10/31/19 12:20	13982-63-3	
		C:NA T:101%					
Radium-228	EPA 904.0	-0.0240 ± 0.355 (0.827)		pCi/L	10/30/19 14:24	15262-20-1	
		C:78% T:89%					
Total Radium	Total Radium Calculation	0.247 ± 0.647 (1.29)		pCi/L	11/01/19 15:00	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

QC Batch: 366494

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1777728

Matrix: Water

Associated Lab Samples: 40196970001, 40196970002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0468 ± 0.331 (0.660) C:NA T:87%	pCi/L	10/31/19 12:20	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

QC Batch: 366493

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 40196970001, 40196970002

METHOD BLANK: 1777725

Matrix: Water

Associated Lab Samples: 40196970001, 40196970002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.00340 ± 0.362 (0.843) C:80% T:79%	pCi/L	10/30/19 14:21	

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QUALIFIERS

Project: 25219067.00 COLUMBIA CCR

Pace Project No.: 40196970

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.

LABORATORIES

PASI-G Pace Analytical Services - Green Bay

PASI-PA Pace Analytical Services - Greensburg

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067.00 COLUMBIA CCR
Pace Project No.: 40196970

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40196970001	MW-301	EPA 3010	337277	EPA 6020	337400
40196970002	MW-84A	EPA 3010	337277	EPA 6020	337400
40196970001	MW-301	EPA 7470	338359	EPA 7470	338406
40196970002	MW-84A	EPA 7470	338359	EPA 7470	338406
40196970001	MW-301				
40196970002	MW-84A				
40196970001	MW-301	EPA 903.1	366494		
40196970002	MW-84A	EPA 903.1	366494		
40196970001	MW-301	EPA 904.0	366493		
40196970002	MW-84A	EPA 904.0	366493		
40196970001	MW-301	Total Radium Calculation	369027		
40196970002	MW-84A	Total Radium Calculation	369027		
40196970001	MW-301	SM 2540C	337571		
40196970002	MW-84A	SM 2540C	337571		
40196970001	MW-301	EPA 9040	337952		
40196970002	MW-84A	EPA 9040	337952		
40196970001	MW-301	EPA 300.0	337822		
40196970002	MW-84A	EPA 300.0	337822		

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(Please Print Clearly)

UPPER MIDWEST REGION

MN: 612-607-1700 WI: 920-469-2436

Page 1 of



CHAIN OF CUSTODY

A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
 H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

FILTERED?
 PRESERVATION
 (CODE)*

Company Name: **SCS Engineers**
 Branch/Location: **Madison WI**
 Project Contact: **Tom Karwowski**
 Phone: **608-224-2830**
 Project Number: **25219067, 00**
 Project Name: **Columbia**
 Project State: **WI's cousin**
 Sampled By (Print): **Adam Watson**
 Sampled By (Sign): *[Signature]*
 PO #: _____

Data Package Options
 EPA Level III
 EPA Level IV
 On your sample (billable)
 NOT needed on your sample

Matrix Codes
 A = Air B = Biota C = Charcoal S = Soil SI = Sludge
 W = Water DW = Drinking Water GW = Ground Water SW = Surface Water WP = Waste Water
 WIP = Wipe

PAGE LAB #	CLIENT FIELD ID	COLLECTION		MATRIX	Analyses Requested
		DATE	TIME		
001	MLD-301	10/9/19	1200	D	Radium 226 & 228
002	MLD-84A	10/9/19	1316	D	Metals <i>See attached table</i>
				A	pH
				A	TDS, Cl, F, SO4

Quote #: _____
Mail To Contact: **Tom Karwowski**
Mail To Company: **SCS Engineers**
Mail To Address: **2830 Dairy Dr. Madison WI 53718**
Invoice To Contact: _____
Invoice To Company: _____
Invoice To Address: _____
Invoice To Phone: _____

CLIENT COMMENTS

LAB COMMENTS (Lab Use Only)
 001
 002

Rush Turnaround Time Requested - Prelims
 (Rush TAT subject to approval/surcharge)
 Date Needed: _____

Transmit Prelim Rush Results by (complete what you want):
 Email #1: _____
 Email #2: _____
 Telephone: _____
 Fax: _____

Relinquished By: *[Signature]* **Date/Time:** 10/9/19 1600
Received By: _____ **Date/Time:** _____

Relinquished By: **CS Logistics** **Date/Time:** 10/10/19 0915
Received By: *[Signature]* **Date/Time:** 10/21/19 0715

Relinquished By: _____ **Date/Time:** _____
Received By: _____ **Date/Time:** _____

Relinquished By: _____ **Date/Time:** _____
Received By: _____ **Date/Time:** _____

Special pricing and release of liability

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 Module 4				COC #4 - Primary Pond				COC #5 - Secondary Pond				
	MW-301	MW-84A	MW-302	MW-53AR	MW-34A	FIELD BLANK - MOD1-3UF	MW-309	MW-310	MW-311	FIELD BLANK - MOD4	MW-303	MW-304	MW-305	MW-4R	FIELD BLANK - POND	MW-506	MW-507	MW-508	FIELD BLANK - SPOND
Boron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
TDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Antimony	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Arsenic	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Berillium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Beryllium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cadmium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Cobalt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Lithium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Molybdenum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Selenium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Thallium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Radium 226+228	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Groundwater Elevation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Well Depth	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Specific Conductance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Disolved Oxygen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ORP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Temperature	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Turbidity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Color	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Odor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Notes: All samples are unfiltered (total).

A:\25219067\00>Data and Calculations\Tables\Low Flow Orders\2019 April CCR CCR-AtRiskSheet

40196970

Sample Preservation Receipt Form

Client Name: Sc Engineers

Project # 40192972

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

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

Lab Lot# of pH paper: 1405089 Lab Sid #/ID of preservation (if pH adjusted):


Initial when completed: AS Date/Time:

Pace Lab #	Glass						Plastic						Vials						Jars			General			VOA Vials (>6mm) *					Volume (ml)					
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN	H2SO4 pH ≤	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2		pH after adjusted				
001																																			2.5 / 5 / 10
002										2		1																							2.5 / 5 / 10
003																																			2.5 / 5 / 10
004																																			2.5 / 5 / 10
005																																			2.5 / 5 / 10
006																																			2.5 / 5 / 10
007																																			2.5 / 5 / 10
008																																			2.5 / 5 / 10
009																																			2.5 / 5 / 10
010																																			2.5 / 5 / 10
011																																			2.5 / 5 / 10
012																																			2.5 / 5 / 10
013																																			2.5 / 5 / 10
014																																			2.5 / 5 / 10
015																																			2.5 / 5 / 10
016																																			2.5 / 5 / 10
017																																			2.5 / 5 / 10
018																																			2.5 / 5 / 10
019																																			2.5 / 5 / 10
020																																			2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRQ, 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	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	1 liter plastic HNO3 pres

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS Engineers Project #: _____
 Courier: CS Logistics Fed Ex Speedee UPS Walto
 Client Pace Other: _____

Tracking #: 2120.100919

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 Zip lock / plastic bag

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


Cooler Temperature Uncorr: RoI /Corr: _____

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

Person examining contents:
 Date: 6/10/19
 Initials: SW

Temp should be above freezing to 6°C.
 Biota Samples may be received at ≤ 0°C.

WO#: 40196970



40196970

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>invoice details not documented</u> ^{10/15/19}
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.
- 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.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
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: _____

Project Manager Review: [Signature] for DM Date: 10-10-19

A3 December 2019 Retesting Event

January 07, 2020

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25219067 ALLIANT-COLUMBIA
Pace Project No.: 40201277

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on December 24, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,



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

Enclosures

cc: Tom Karwoski, SCS ENGINEERS
Nicole Kron, 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: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

Pace Analytical Services Green Bay

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40201277001	MW-310	Water	12/23/19 12:37	12/24/19 09:05

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40201277001	MW-310	EPA 6020	KXS AXL	1 7

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

Sample: MW-310 **Lab ID: 40201277001** Collected: 12/23/19 12:37 Received: 12/24/19 09:05 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
------------	---------	-------	-----	-----	----	----------	----------	---------	------

6020 MET ICPMS Analytical Method: EPA 6020 Preparation Method: EPA 3010

Calcium	55400	ug/L	2540	762	10	01/02/20 05:43	01/03/20 04:34	7440-70-2	P6
---------	--------------	------	------	-----	----	----------------	----------------	-----------	----

Field Data Analytical Method:

Field pH	7.70	Std. Units			1		12/23/19 12:37		
Field Specific Conductance	1416	umhos/cm			1		12/23/19 12:37		
Oxygen, Dissolved	9.65	mg/L			1		12/23/19 12:37	7782-44-7	
REDOX	40.0	mV			1		12/23/19 12:37		
Turbidity	2.06	NTU			1		12/23/19 12:37		
Static Water Level	775.22	feet			1		12/23/19 12:37		
Temperature, Water (C)	12.4	deg C			1		12/23/19 12:37		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 25219067 ALLIANT-COLUMBIA
Pace Project No.: 40201277

QC Batch: 344644 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 40201277001

METHOD BLANK: 1999854 Matrix: Water
Associated Lab Samples: 40201277001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Calcium	ug/L	<76.2	254	01/03/20 04:20	

LABORATORY CONTROL SAMPLE: 1999855

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	5000	5020	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1999856 1999857

Parameter	Units	40201277001		1999856		1999857		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Calcium	ug/L	55400	5000	5000	61300	65500	117	202	75-125	7	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

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QUALIFIERS

Project: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

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

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25219067 ALLIANT-COLUMBIA

Pace Project No.: 40201277

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40201277001	MW-310	EPA 3010	344644	EPA 6020	344747
40201277001	MW-310				

REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

Company Name: SCS
 Branch/Location: MANISON
 Project Contact: Mrs. Brodeur
 Phone: 603-216-9362
 Project Number: 25219067
 Project Name: Alliant - Colvard Rd
 Project State: VT
 Sampled By (Print): Paul A. Grover
 Sampled By (Sign): Paul A. Grover
 PO #: _____
 Regulatory Program: _____

Data Package Options
 (billable)
 EPA Level III
 EPA Level IV

MSMSD
 (billable)
 On your sample
 NOT needed on your sample

Matrix Codes
 A = Air
 B = Biota
 C = Charcoal
 O = Oil
 S = Soil
 SI = Sludge
 W = Water
 DW = Drinking Water
 GW = Ground Water
 SW = Surface Water
 WW = Waste Water
 WP = Wipe

PAGE LAB # _____ CLIENT FIELD ID _____
001 MMU-310
 DATE: 12/21/19 TIME: 12:37 PM MATRIX: _____



CHAIN OF CUSTODY

A=None B=HCL C=H2SO4 D=HNO3 E=D Water F=Methanol G=NaOH
 H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

ANALYSES REQUESTED	V/I/N	PICK LETTER	DATE/TIME	RECEIVED BY	DATE/TIME
Calcium	ND	D			

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
Paul A. Grover	12/23/19 13:45	[Signature]	12/24/19 09:05
CS Logistics	12/24/19	[Signature]	12/24/19 09:05

Quote #: _____
 Mail To Contact: _____
 Mail To Company: _____
 Mail To Address: _____
 Invoice To Contact: _____
 Invoice To Company: _____
 Invoice To Address: _____
 Invoice To Phone: _____
 CLIENT COMMENTS: _____
 LAB COMMENTS (Lab Use Only): _____
 Profile #: _____

SCS

PAGE Project No. 40001277
 Receipt Temp = NA °C
 Sample Receipt pH OK / Adjusted
 Cooler Custody Seal Present / Not Present Intact / Not Intact

Sample Preservation Receipt Form


Client Name: 3CS

Project # 4801877

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

Lab Lot# of pH paper: 10253581

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

Initial when completed: 


Date/Time: _____

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

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)
001	AG1U	BP1U	DG9A	JGFU	SP5T						7	2.5 / 5 / 10
002	AG1H	BP2N	DG9T	WGFU	ZPLC							2.5 / 5 / 10
003	AG4S	BP2Z	VG9U	WPFU	GN							2.5 / 5 / 10
004	AG4U	BP3U	VG9H									2.5 / 5 / 10
005	AG5U	BP3B	VG9M									2.5 / 5 / 10
006	AG2S	BP3N	VG9D									2.5 / 5 / 10
007	BG3U	BP3S										2.5 / 5 / 10
008												2.5 / 5 / 10
009												2.5 / 5 / 10
010												2.5 / 5 / 10
011												2.5 / 5 / 10
012												2.5 / 5 / 10
013												2.5 / 5 / 10
014												2.5 / 5 / 10
015												2.5 / 5 / 10
016												2.5 / 5 / 10
017												2.5 / 5 / 10
018												2.5 / 5 / 10
019												2.5 / 5 / 10
020												2.5 / 5 / 10


Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ 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	DG9A 40 mL amber ascorbic	JGFU 4 oz amber jar unpres
AG1H 1 liter amber glass HCL	BP2N 500 mL plastic HNO3	DG9T 40 mL amber Na Thio	WGFU 4 oz clear jar unpres
AG4S 125 mL amber glass H2SO4	BP2Z 500 mL plastic NaOH, Znact	VG9U 40 mL clear vial unpres	WPFU 4 oz plastic jar unpres
AG4U 120 mL amber glass unpres	BP3U 250 mL plastic unpres	VG9H 40 mL clear vial HCL	
AG5U 100 mL amber glass unpres	BP3B 250 mL plastic NaOH	VG9M 40 mL clear vial MeOH	SP5T 120 mL plastic Na Thiosulfate
AG2S 500 mL amber glass H2SO4	BP3N 250 mL plastic HNO3	VG9D 40 mL clear vial DI	ZPLC ziploc bag
BG3U 250 mL clear glass unpres	BP3S 250 mL plastic H2SO4		GN:

 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS
Courier: CS Logistics Fed Ex Speedee UPS Walto
 Client Pace Other: _____

Project #: _____
WO#: 40201277

 40201277

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 - N/A **Type of Ice:** Wet Blue Dry None Samples on ice, cooling process has begun
Cooler Temperature Uncorr: N/A ICorr: _____
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.

Person examining contents:
 Date: 12/24/19
 Initials: _____

Chain of Custody Present:	<input 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>post, mail, invoice</u>
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. <u>12/24/19</u>
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.
- 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 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.
-Pace Containers Used:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
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: _____

Project Manager Review: [Signature] **Date:** 12/24/19

Appendix B

Alternative Source Demonstration, April 2019 Detection Monitoring

Alternative Source Demonstration April 2019 Detection Monitoring

Dry Ash Disposal Facility – Module 4
Columbia Energy Center
Pardeeville, Wisconsin

Prepared for:



SCS ENGINEERS

25217156.01 | October 14, 2019

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

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Figures

Figure 1.	Site Location Map
Figure 2.	Site Plan and Well Location Map
Figure 3.	Water Table Map – April 2019



Appendices

Appendix A	Trend Plots for CCR Wells
Appendix B	Regional Geologic and Hydrogeologic Background Information

I:\25219067.00\Deliverables\2019 April ASD COL MOD 4 LF\191014_COL_MOD 4 LF_April ASD.docx

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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>10-11-19</p>
	<p>(signature)</p>	<p>(date)</p>
	<p>Sherren Clark</p>	
	<p>(printed or typed name)</p>	
<p>License number <u>E-29863</u></p>		
<p>My license renewal date is July 31, 2020.</p>		
<p>Pages or sheets covered by this seal: Alternative Source Demonstration, April 2019 Detection Monitoring, Columbia Energy Center Dry Ash Disposal Facility – Module 4 Pardeeville, Wisconsin</p>		

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the “Coal Combustion Residuals (CCR) Final Rule” published by the U.S. Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 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. The ASD is completed to determine if any other sources are likely causes of the identified exceedance(s) of established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSI observed in the statistical evaluation of the April 2019 detection monitoring event at the Columbia Energy Center (COL) Dry Ash Disposal Facility, Module 4 CCR Unit (MOD 4).

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 will evaluate the conditions at the site for MOD 4 of the ADF only. The ADF is operated under the Wisconsin Department of Natural Resources (WDNR) License No. 3025.

The groundwater monitoring system for the COL ADF MOD 4, is monitoring a single existing CCR Unit.

A map showing the CCR Unit and all background and compliance 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 Modules 1-3 of the COL ADF, for the primary ash pond and for the secondary ash pond.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

An SSI was identified for field pH at monitoring well MW-310, based on the April 2019 detection monitoring event.

A summary of the April 2019 monitoring results and the established benchmarks is provided in **Table 1**. The result with an SSI above background is highlighted in the table. A time series graph for pH shown is in **Appendix A**.

The April 2019 field pH result for MW-310 was above the upper prediction limit (UPL); however, a second sample collected in June 2019 was below the UPL.

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**)
- Site groundwater monitoring recommendations (**Section 4.0**)

The results from background and compliance sampling for parameters with SSIs are provided in **Table 2**. Complete laboratory reports for the background monitoring events were included in the 2018 annual groundwater monitoring and corrective action report. The laboratory report for the April 2019 detection monitoring event will be included in the 2019 annual groundwater monitoring and corrective action report.

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 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.

A summary of the regional hydrogeologic stratigraphy is presented in **Appendix B**. 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 B**.

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 B**.

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 well MW-301, the unconsolidated materials were identified as consisting primarily of silty sand. The boring log for previously installed monitoring well MW-84A 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 northwest across the existing landfill area, then generally flows west toward the Wisconsin River. A groundwater flow map for April 2019 is shown on **Figure 3**. The groundwater elevation data for the state and CCR monitoring 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 compliance monitoring wells. The background wells include MW-301 and MW-84A. The compliance 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 24 to 36 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 if necessary.

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.

Based on a review of the field notes, it appears that in the original sampling the dissolved oxygen data and pH data for MW-310 were accidentally entered in the wrong columns on the field data sheet (switched), causing the apparent SSI. On June 12, 2019, SCS Engineers (SCS) collected field parameters again from the MW-310 monitoring well. The field pH measurement was similar to background monitoring results for this well, and was below the UPL (**Table 1**).

3.2 LABORATORY ANALYSIS REVIEW

The laboratory report for the April 2019 detection monitoring event was reviewed to evaluate whether there were any laboratory analysis errors and/or issues.

Because field pH is a field parameter, the laboratory's role is only to enter the field data into their reporting system. No laboratory error was identified.

3.3 STATISTICAL EVALUATION REVIEW

The review of the statistical results and methods include 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 an intrawell SSI for pH for the April 2019 detection monitoring event.

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).

On review, the parametric UPL calculations were revised from a 95% one-sided comparison to a 99% one-sided comparison, consistent with the CCR Rule and Unified Guidance, but this did not change the SSI evaluation outcome for any parameters. The UPLs are shown in **Table 1**.

The time series plots are provided in **Appendix A**. As discussed in **Section 3.1**, the time series plot shows the field pH value recorded incorrectly in April 2019 and the June 2019 result consistent with previous results.

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS & ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

In summary, the SSI identified for pH for MW-310 for the April 2019 monitoring event was determined to be due to a field data collection error that occurred during the sampling event, and not reflective of true groundwater quality.

4.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

In accordance with section 257.94(e)(2) of the CCR Rule, the COL MOD 4 CCR Unit site may continue with detection monitoring based on this ASD. The ASD report will be included in the 2019 Annual Report due January 31, 2020.

5.0 REFERENCES

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

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

USEPA, 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.

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Tables

- 1 Detection Monitoring Results Summary – April and June 2019
- 2 Analytical Results – Appendix III Constituents with SSIs
- 3 Groundwater Elevations – State Monitoring Program and CCR Well Network

**Table 1. Detection Monitoring Results Summary - April and June 2019
Columbia Dry Ash Disposal Facility - Module 4 / SCS Engineers Project #25219067.00**

Parameter Name	Background Wells		Compliance Wells						
	MW-84A	MW-301	MW-309		MW-310			MW-311	
	4/3/2019	4/2/2019	Intrawell UPL	4/2/2019	Intrawell UPL	4/2/2019	6/12/2019	Intrawell UPL	4/2/2019
Boron, µg/L	13.6	26.9	45.73	37.4	87.41	73.0	NA	54.62	35.7
Calcium, µg/L	80,100	126,000 P6	114,236	45,300	64,861	38,800	NA	90,368	65,600
Chloride, mg/L	3.6 B	0.79 J	1097	145	249	76.0	NA	4.93	1.9
Fluoride, mg/L	<0.10	<0.10	DQ	<0.10	DQ	<0.10	NA	DQ	<0.10
Field pH, Std. Units	7.03	6.62	8.28	7.49	8.19	9.79	7.82	8.17	7.51
Sulfate, mg/L	1.4 J	4.4 J,D3	62.94	35.2	118	58.4	NA	159	23.1
Total Dissolved Solids, mg/L	318	462	2,049	548	850	470	NA	509	276

Highlighted cell indicates the compliance well result is an SSI.

Abbreviations:

UPL = Upper Prediction Limit

NA = Not Analyzed

LOQ = Limit of Quantification

µg/L = micrograms per liter

mg/L = milligrams per liter

SSI = Statistically Significant Increase

DQ = Double Quantification rule applies (not detected in background samples)

B = Analyte was detected in the associated Method Blank.

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

D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

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

Notes:

1. Intrawell UPLs based on parametric prediction interval analysis for all parameters except fluoride and sulfate at MW-310. Natural log transformation used for parametric prediction interval analysis for calcium at MW-310.

2. Intrawell UPL for sulfate at MW-310 based on non-parametric interval analysis.

3. Intrawell UPLs calculated from background well results for February 2018 through September 2018.

Created by: NDK

Date: 5/16/2019

Last revision by: NDK

Date: 9/23/2019

Checked by: LMH

Date: 9/23/2019

I:\25219067.00\Deliverables\2019 April ASD COL MOD 4 LF\Tables\[1_CCR GW Screening Summary_COL LF Mod 4-Intrawell option.xlsx]Table

**Table 2. Analytical Results - Appendix III Constituents with SSIs
CCR Landfill MOD 4, Columbia Generation Station
Pardeeville, Wisconsin**

Well Group	Well	Collection Date	Field pH (std units)
Background	MW-301	12/22/2015	6.85
		4/5/2016	7.01
		7/8/2016	6.87
		10/13/2016	7.28
		12/29/2016	6.63
		1/25/2017	7.10
		4/11/2017	7.11
		6/6/2017	6.70
		8/8/2017	6.75
		10/23/2017	7.37
		4/25/2018	6.76
		8/8/2018	6.91
		10/24/2018	6.79
	4/2/2019	6.62	
	MW-84A	12/22/2015	7.60
		4/5/2016	7.61
		7/8/2016	7.45
		7/28/2016	7.34
		10/13/2016	7.91
		12/29/2016	7.25
		1/25/2017	6.99
		4/11/2017	7.80
		6/6/2017	7.28
		8/8/2017	7.23
		10/24/2017	7.68
4/25/2018		7.45	
8/8/2019	7.38		
10/24/2018	7.24		
4/3/2019	7.03		
Compliance	MW-309	2/21/2018	7.84
		3/23/2018	8.08
		4/23/2018	7.71
		5/24/2018	7.59
		6/23/2018	7.50
		7/23/2018	7.55
		8/22/2018	7.53
		9/21/2018	7.83
		10/22/2018	7.56
	4/2/2019	7.49	
	MW-310	2/21/2018	7.85
		3/23/2018	8.06
		4/23/2018	7.75
		5/24/2018	7.74
		6/23/2018	7.82
		7/23/2018	7.81
		8/22/2018	7.77
		9/21/2018	7.98
		10/22/2018	7.70
4/2/2019		9.79	
6/12/2019	7.82		

**Table 2. Analytical Results - Appendix III Constituents with SSIs
CCR Landfill MOD 4, Columbia Generation Station
Pardeeville, Wisconsin**

Well Group	Well	Collection Date	Field pH (std units)
Compliance	MW-311	2/21/2018	7.72
		3/23/2018	7.93
		4/23/2018	7.62
		5/24/2018	7.54
		6/23/2018	7.65
		7/23/2018	7.59
		8/22/2018	7.60
		9/21/2018	7.95
		10/22/2018	7.50
		4/2/2019	7.51

Notes:

(1) Analytical laboratory reports provided in the 2018 Annual Groundwater Monitoring and Corrective Action Report.

Created by: <u>NDK</u>	Date: <u>9/10/2019</u>
Last revision by: <u>NDK</u>	Date: <u>9/10/2019</u>
Checked by: <u>AJR</u>	Date: <u>9/10/2019</u>

I:\25219067.00\Deliverables\2019 April ASD COL MOD 4 LF\Tables\[2_MOD 4 LF ASD.xlsx]Table 2. Analy. Rslts- CCR

Table 3. Groundwater Elevations - State Monitoring Program and CCR Well Network
CCR Landfill Module 4, Columbia Generating Station
Pardeeville, Wisconsin

Dry Ash Facility	Well Number	MW-1AR	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
	Top of Casing Elevation (feet amsl)	822.55	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
	Screen Length (ft)															
	Total Depth (ft from top of casing)	44.40	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
	Top of Well Screen Elevation (ft)	778.15	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
	Measurement Date															
	April 4-6, 2016	785.82	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
	October 3-5, 2017	785.48	786.66	784.51	784.22	784.67	784.63	784.86	784.29	--	786.49	785.58	786.08	785.83	786.47	786.02
	October 9-10, 2017	--	--	--	--	--	--	--	--	785.56 ⁽²⁾	--	--	--	--	--	--
	April 23-25, 2018	783.99	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
October 23-25, 2018	788.25	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	
April 1-4, 2019	787.05	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	
Bottom of Well Elevation (ft)	778.15	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	

Ash Pond Facility	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	792.90
	Screen Length (ft)											
	Total Depth (ft from top of casing)	16.90	25.55	34.80	76.07	51.88	75.80	14.40	38.50	37.85	37.37	18.96
	Top of Well Screen Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94
	Measurement Date											
	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 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 22-24, 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	
Bottom of Well Elevation (ft)	771.33	780.55	774.82	733.43	776.98	753.04	771.89	776.98	776.36	754.18	773.94	

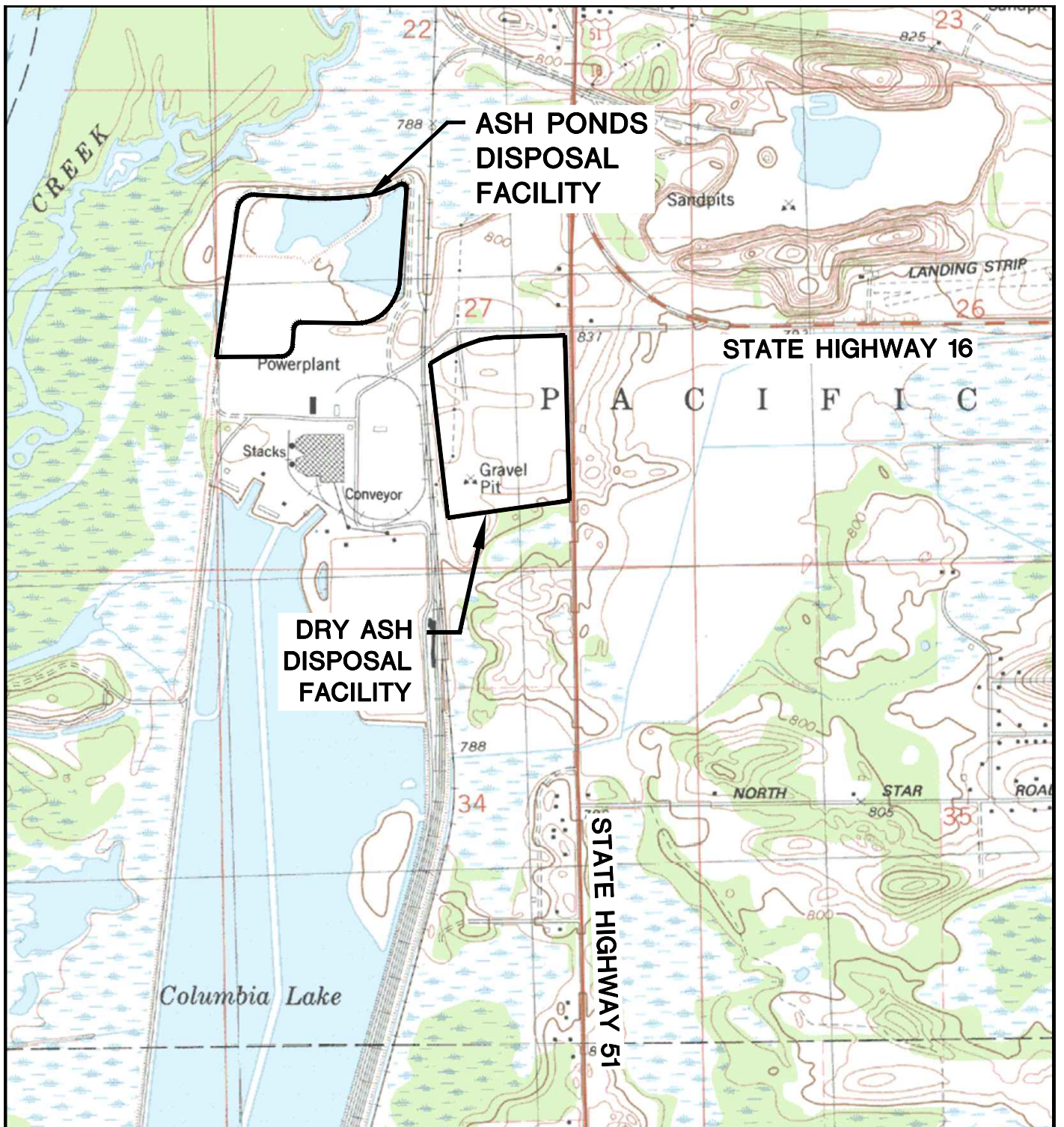
	Well Number	Background Wells		Mod 1- 3 LF			Primary Pond			Secondary Pond			Mod 4 Landfill			
		MW-301	MW-84A	MW-302	MW-33AR	MW-34A	MW-303	MW-304	MW-305	M-4R	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311
	Top of Casing Elevation (feet amsl)	806.89	814.28	813.00	808.29	805.95	811.52	805.42	806.32	806.1	807.63	806.89	806.9	813.27	813.62	809.74
	Screen Length (ft)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	Total Depth (ft from top of casing)	29.40	40.21	33.6	31.08	35.43	35.8	25.7	25.6	39.58	27	26.5	28	37.67	38.41	36.19
	Top of Well Screen Elevation (ft)	787.49	784.07	789.40	787.21	780.52	785.72	789.72	790.72	776.52	790.63	790.39	788.90	785.60	785.21	783.55
	Measurement Date															
	April 4-5, 2016	786.78	786.37	785.81	785.29	785.63	785.48	788.08	789.61	789.09	--	--	--	--	--	--
	July 7-8, 2016	786.31	785.89	786.28	785.19	785.05	784.60	787.36	789.26	787.43	--	--	--	--	--	--
	July 28, 2016	NM	785.61	NM	NM	784.86	784.35	NM	NM	NM	--	--	--	--	--	--
	October 11-13, 2016	787.64	787.22	787.76	787.36	786.45	786.18	788.18	789.78	787.88	--	--	--	--	--	--
	December 29, 2016	787.37	786.63	787.05	785.66	785.72	NM	NM	NM	NM	--	--	--	--	--	--
	January 25-26, 2017	787.27	786.70	786.89	785.88	785.98	785.28	789.34	789.36	789.64	785.50	785.36	785.73	--	--	--
	April 10 & 11, 2017	787.89	787.16	787.55	786.39	786.30	786.00	788.22	789.57	787.95	786.22	785.64	786.51	--	--	--
	June 6, 2017	788.25	787.63	788.37	787.27	786.66	786.49	788.58	789.79	787.83	786.85	786.07	786.46	--	--	--
	August 7-9, 2017	787.34	786.68	787.55	786.11	785.81	785.42	789.52	789.30	788.54	785.69	785.19	785.37	--	--	--
	October 23-24, 2017	785.89	785.32	785.94	784.13	784.50	783.92	788.97	788.14	788.00	783.97	784.79	784.17	--	--	--
	February 21, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.19	783.05	783.02
	March 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	783.10	783.10	783.00
	April 23-25, 2018	785.29	785.88	784.37	783.09	781.77	783.27	789.69	787.67	790.43	783.24	783.65	782.65	783.07	782.97	781.83
	May 24, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.79	785.09	NM	785.45	785.97	786.11
	June 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.03	786.64	786.47
	July 23, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	786.27	786.35	786.55
	August 7, 2018	787.06	786.55	NM	NM	NM	785.20	788.25	788.56	787.63	NM	NM	NM	NM	NM	NM
	August 22, 2018	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	785.54	785.40	785.46
	September 21, 2018	NM	NM	788.37	787.90	787.01	786.50	NM	NM	NM	NM	NM	NM	787.08	787.24	787.66
	October 22-24, 2018	788.98	788.32	789.16	788.77	787.88	787.51	789.05	790.04	788.47	787.66	786.57	787.81	787.99	788.18	788.64
	April 1-4, 2019	787.04	787.35	787.56	786.63	786.82	786.52	789.72	790.07	789.44	786.72	786.71	787.53	786.30	786.38	786.38
	Bottom of Well Elevation (ft)	771.33	776.36	780.55	771.89	776.98	774.82	733.43	776.98	753.04	780.63	780.39	778.90	775.60	775.21	773.55

Notes:
 NM = not measured
 Created by: MDB Date: 5/6/2013
 Last revision by: NDK Date: 8/1/2019
 Checked by: AJR Date: 8/21/2019

(1) Water Levels collected during sample collection.
 (2) The depth to water at MW-84A was not measured prior to purging for sampling during the October 3-5, 2017 sampling event. The level was allowed to return to static and was measured on 10/10/2017.

Figures

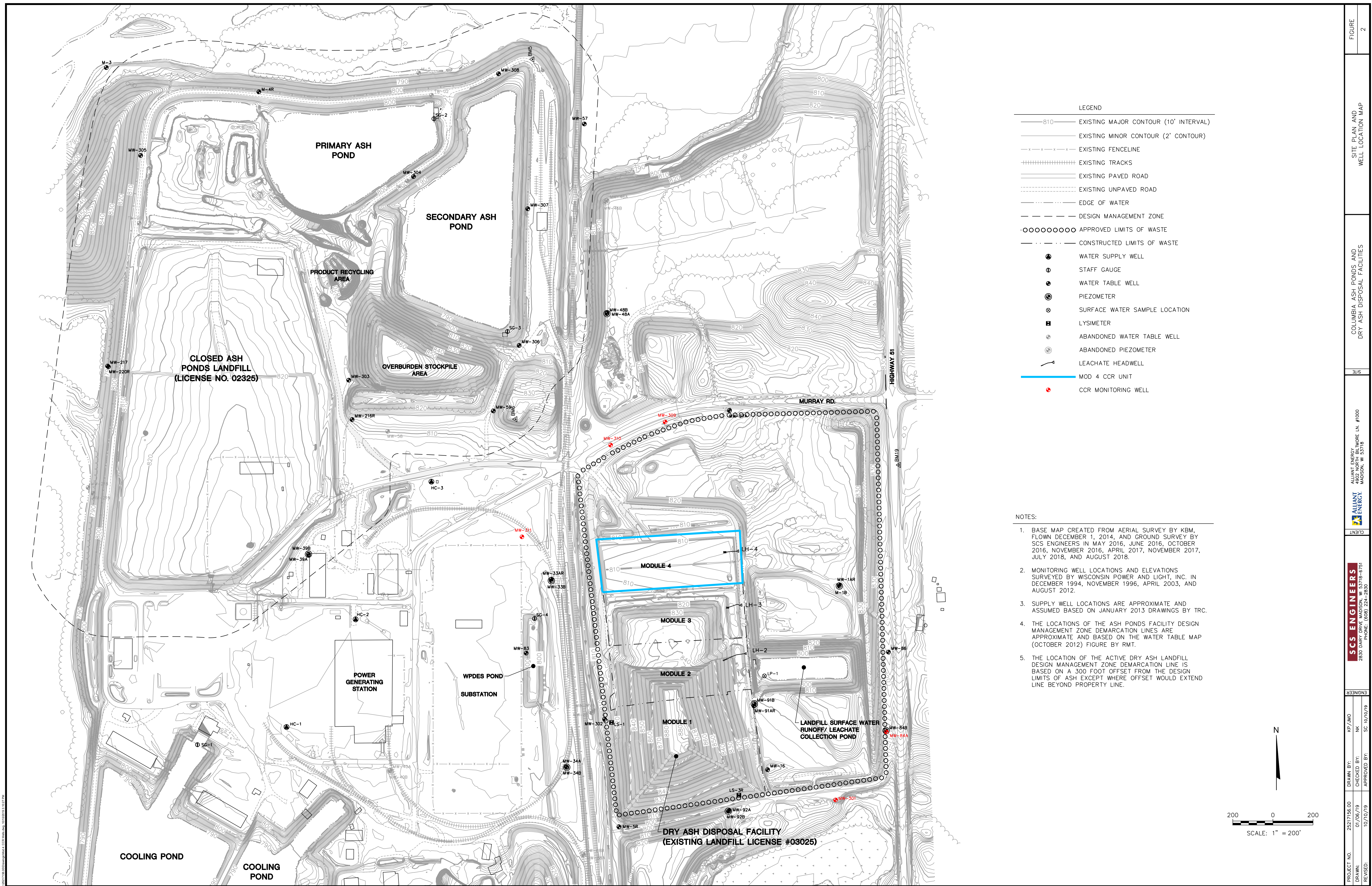
- 1 Site Location Map
- 2 Site Plan and Well Location Map
- 3 Water Table Map – April 2019



POYNETTE QUADRANGLE
 WISCONSIN—COLUMBIA CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 NW/4 POYNETTE 15' QUADRANGLE
 1984
 SCALE: 1" = 2,000'



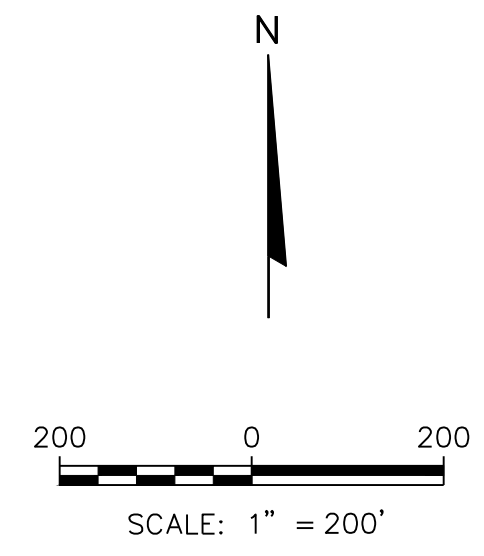
CLIENT	ALLIANT ENERGY 4902 NORTH BILTMORE LN. #1000 MADISON, WI 53718	SITE	COLUMBIA ASH PONDS AND DRY ASH DISPOSAL FACILITIES	SITE LOCATION MAP	
				PROJECT NO. 25216067.00	DRAWN BY: KP
DRAWN: 08/10/09	CHECKED BY: MDB	1			
REVISED: 04/16/18	APPROVED BY: SC 04/16/18	ENGINEER			

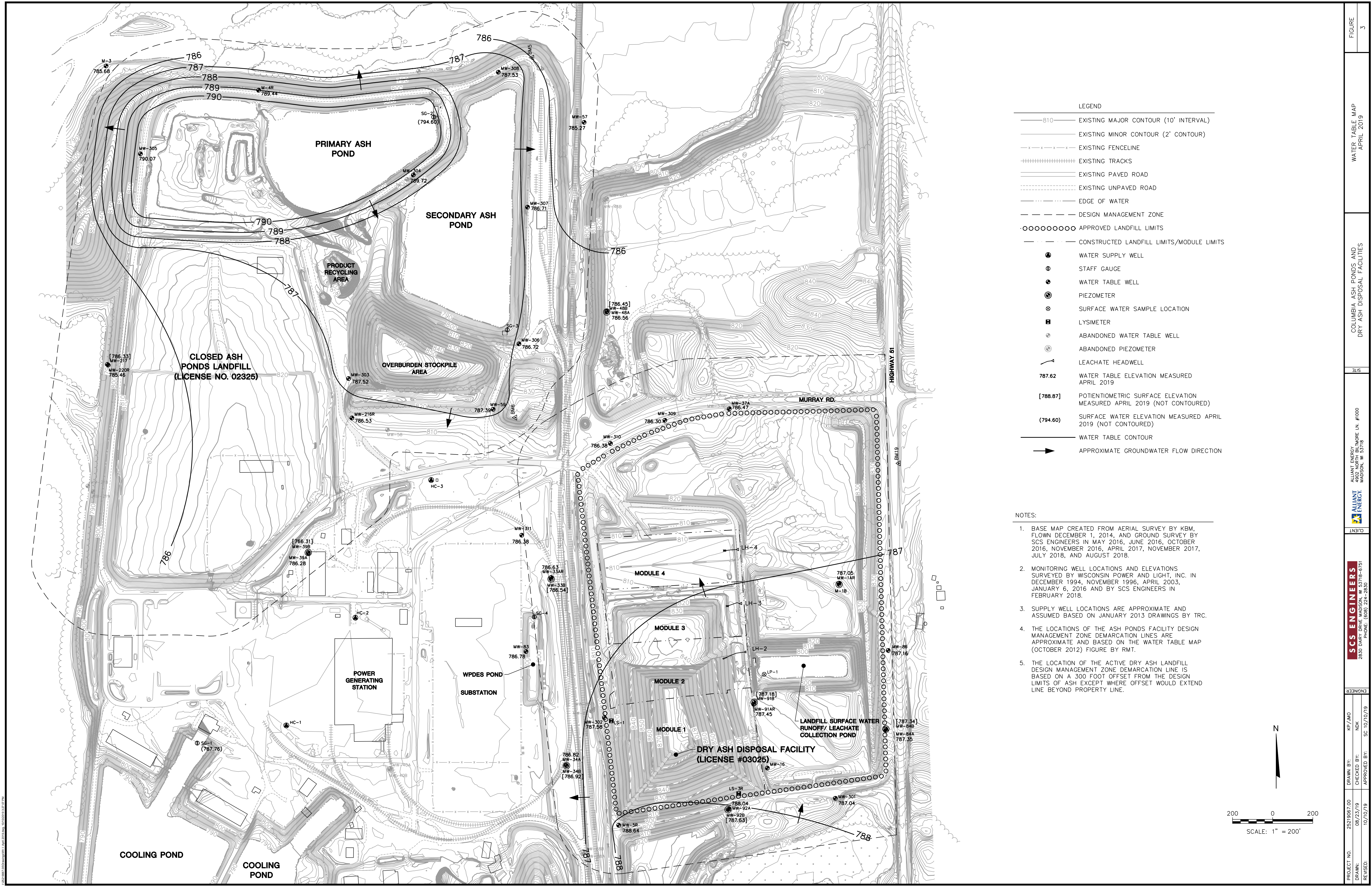


LEGEND

	EXISTING MAJOR CONTOUR (10' INTERVAL)
	EXISTING MINOR CONTOUR (2' CONTOUR)
	EXISTING FENCELINE
	EXISTING TRACKS
	EXISTING PAVED ROAD
	EXISTING UNPAVED ROAD
	EDGE OF WATER
	DESIGN MANAGEMENT ZONE
	APPROVED LIMITS OF WASTE
	CONSTRUCTED LIMITS OF WASTE
	WATER SUPPLY WELL
	STAFF GAUGE
	WATER TABLE WELL
	PIEZOMETER
	SURFACE WATER SAMPLE LOCATION
	LYSIMETER
	ABANDONED WATER TABLE WELL
	ABANDONED PIEZOMETER
	LEACHATE HEADWELL
	MOD 4 CCR UNIT
	CCR MONITORING WELL

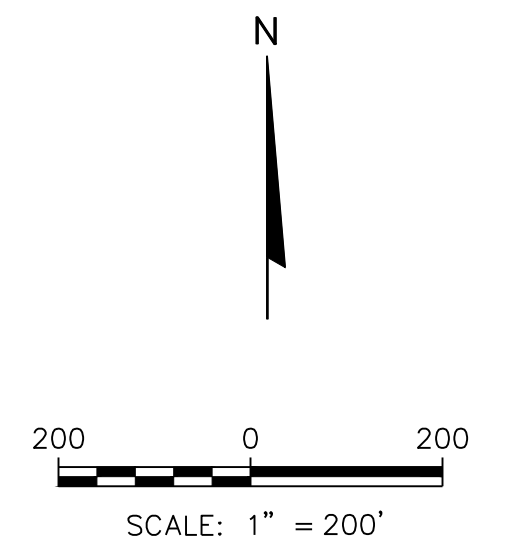
- NOTES:**
1. BASE MAP CREATED FROM AERIAL SURVEY BY KBM, FLOWN DECEMBER 1, 2014, AND GROUND SURVEY BY SCS ENGINEERS IN MAY 2016, JUNE 2016, OCTOBER 2016, NOVEMBER 2016, APRIL 2017, NOVEMBER 2017, JULY 2018, AND AUGUST 2018.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, AND AUGUST 2012.
 3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
 4. THE LOCATIONS OF THE ASH PONDS FACILITY DESIGN MANAGEMENT ZONE DEMARCATION LINES ARE APPROXIMATE AND BASED ON THE WATER TABLE MAP (OCTOBER 2012) FIGURE BY RMT.
 5. THE LOCATION OF THE ACTIVE DRY ASH LANDFILL DESIGN MANAGEMENT ZONE DEMARCATION LINE IS BASED ON A 300 FOOT OFFSET FROM THE DESIGN LIMITS OF ASH EXCEPT WHERE OFFSET WOULD EXTEND LINE BEYOND PROPERTY LINE.






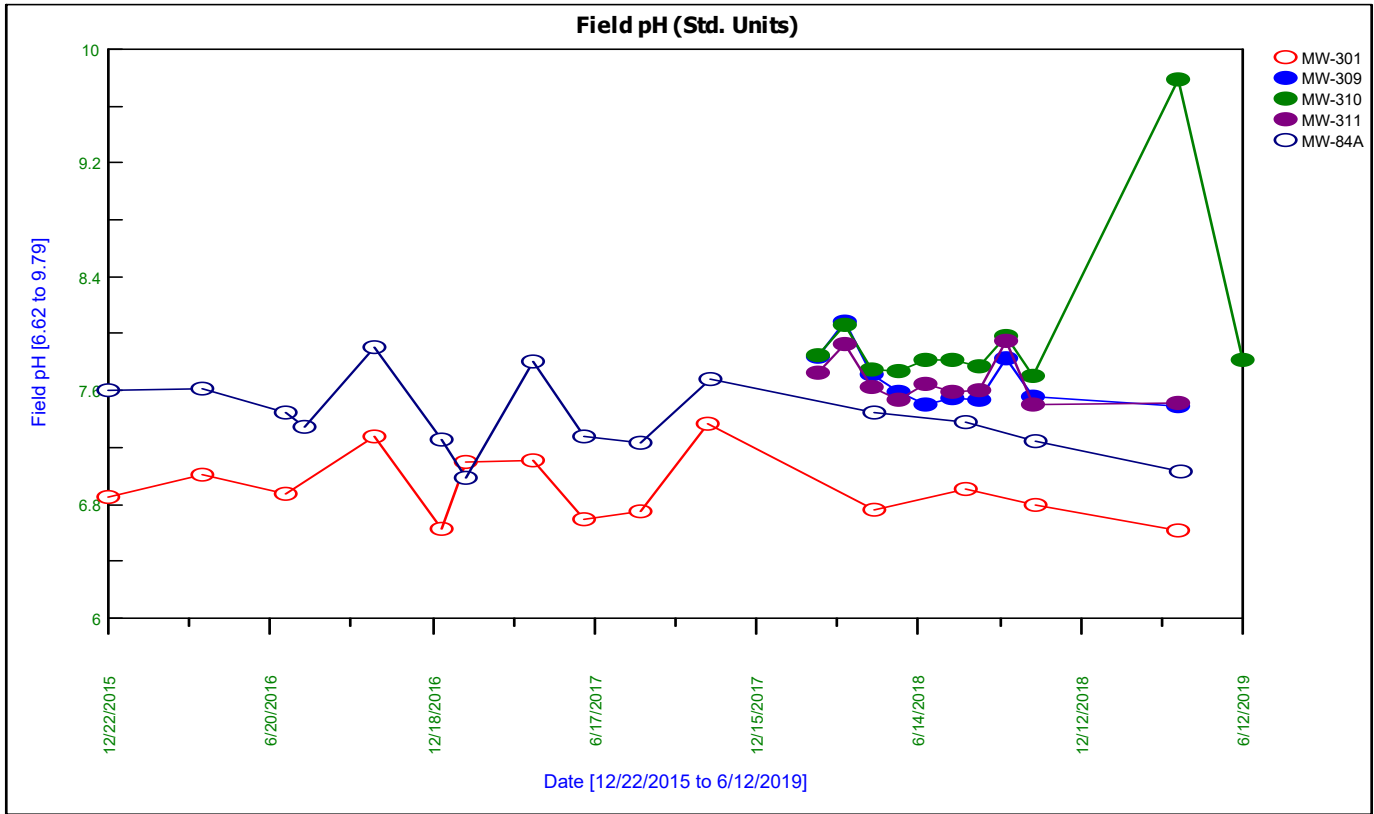
- LEGEND**
- EXISTING MAJOR CONTOUR (10' INTERVAL)
 - EXISTING MINOR CONTOUR (2' CONTOUR)
 - EXISTING FENCELINE
 - EXISTING TRACKS
 - EXISTING PAVED ROAD
 - EXISTING UNPAVED ROAD
 - EDGE OF WATER
 - DESIGN MANAGEMENT ZONE
 - APPROVED LANDFILL LIMITS
 - CONSTRUCTED LANDFILL LIMITS/MODULE LIMITS
 - WATER SUPPLY WELL
 - STAFF GAUGE
 - WATER TABLE WELL
 - PIEZOMETER
 - SURFACE WATER SAMPLE LOCATION
 - LYSIMETER
 - ABANDONED WATER TABLE WELL
 - ABANDONED PIEZOMETER
 - LEACHATE HEADWELL
 - WATER TABLE ELEVATION MEASURED APRIL 2019
 - POTENTIOMETRIC SURFACE ELEVATION MEASURED APRIL 2019 (NOT CONTOURED)
 - SURFACE WATER ELEVATION MEASURED APRIL 2019 (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, AND AUGUST 2018.
 2. MONITORING WELL LOCATIONS AND ELEVATIONS SURVEYED BY WISCONSIN POWER AND LIGHT, INC. IN DECEMBER 1994, NOVEMBER 1996, APRIL 2003, JANUARY 6, 2016 AND BY SCS ENGINEERS IN FEBRUARY 2018.
 3. SUPPLY WELL LOCATIONS ARE APPROXIMATE AND ASSUMED BASED ON JANUARY 2013 DRAWINGS BY TRC.
 4. THE LOCATIONS OF THE ASH PONDS FACILITY DESIGN MANAGEMENT ZONE DEMARCATION LINES ARE APPROXIMATE AND BASED ON THE WATER TABLE MAP (OCTOBER 2012) FIGURE BY RMT.
 5. THE LOCATION OF THE ACTIVE DRY ASH LANDFILL DESIGN MANAGEMENT ZONE DEMARCATION LINE IS BASED ON A 300 FOOT OFFSET FROM THE DESIGN LIMITS OF ASH EXCEPT WHERE OFFSET WOULD EXTEND LINE BEYOND PROPERTY LINE.





Appendix A
Trend Plots for CCR Wells





Appendix B

Regional Geologic and Hydrogeologic Background Information

Property Owner: WISCONSIN POWER & LIGHT CO
Telephone Number: - -
Mailing Address: PO BOX 98
City: PORTAGE State: WI Zip Code: 53901
County of Well Location: SC Co Well Permit No: W Well Completion Date: December 30, 1971

1. Well Location
T=Town C=City V=Village
T of PACIFIC
Depth 255 FT
Street Address or Road Name and Number
Subdivision Name Lot# Block #

Well Constructor: EGERER GALLOWAY WELL CORP License #: 21 Facility ID (Public): 111021460
Address: CARMEN/STATE/N 3RD
City: MILWAUKEE State: WI Zip Code: 53213
Hicap Permanent Well #: Common Well #: Specific Capacity: 12.5 gpm/ft

Gov't Lot or SW 1/4 of SW 1/4 of
Section 27 T 12 N R 9 E
2. Well Type 1 (See item 12 below)
1=New 2=Replacement 3=Reconstruction
of previous unique well # _____ constructed in _____
Reason for replaced or reconstructed Well?
1 1=Drilled 2=Driven Point 3=Jetted 4=Other

3. Well Serves # of homes and or INDUSTRIAL
N (eg: barn, restaurant, church, school, industry, etc.)
High Capacity: Well? N Property? N
M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? N
Well located in floodplain? N
Distance in feet from well to nearest: (including proposed)
1. Landfill 2. Building Overhang 3. 1=Septic 2= Holding Tank 4. Sewage Absorption Unit 5. Nonconforming Pit 6. Buried Home Heating Oil Tank 7. Buried Petroleum Tank 8. 1=Shoreline 2= Swimming Pool
9. Downspout/ Yard Hydrant 10. Privy 11. Foundation Drain to Clearwater 12. Foundation Drain to Sewer 13. Building Drain 1=Cast Iron or Plastic 2=Other 14. Building Sewer 1=Gravity 2=Pressure 1=Cast Iron or Plastic 2=Other 15. Collector Sewer: ___ units ___ in . diam. 16. Clearwater Sump
17. Wastewater Sump 18. Paved Animal Barn Pen 19. Animal Yard or Shelter 20. Silo 21. Barn Gutter 22. Manure Pipe 1=Gravity 2=Pressure 1=Cast iron or Plastic 2=Other 23. Other manure Storage 24. Ditch 25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

From (ft)	To (ft)	Upper Enlarged Drillhole	Lower Open Bedrock
19.0	surface	132	
15.0	132	255	

1. Rotary - Mud Circulation
2. Rotary - Air
3. Rotary - Air and Foam
4. Drill-Through Casing Hammer
5. Reverse Rotary
X 6. Cable-tool Bit _ n. dia
7. Temp. Outer Casing _ in. dia. ___ depth ft. Removed?
Other

8. Geology

Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
__T_	GLACIAL DRIFT	0	88
__N_	SANDSTONE	88	255

6. Casing Liner Screen

Dia. (in.)	Material, Weight, Specification	From (ft.)	To (ft.)
20.0	STEEL 3/8 WALL A53-B	surface	92
16.0	STEEL 3/8 WALL A53-B	0	132

7. Grout or Other Sealing Material

Method	Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
	NEAT CEMENT	surface	132.0	

9. Static Water Level: 28.0 feet B ground surface A=Above B=Below
10. Pump Test: Pumping level 48.0 ft. below surface Pumping at 250.0 GP 12.0 Hrs
11. Well Is: 24 in. A Grade A=Above B=Below Developed? N Disinfected? Y Capped? Y

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property? N
If no, explain
13. Initials of Well Constructor or Supervisory Driller: GG Date Signed: 12/30/71
Initials of Drill Rig Operator (Mandatory unless same as above) Date Signed

WELL CONSTRUCTOR'S REPORT
FORM 3300-15

* CORRECTED DEC. 14, 1972

DEC 20 1972

NOTE
WHITE COPY - DIVISION'S COPY
GREEN COPY - DRILLER'S COPY
YELLOW COPY - OWNER'S COPY

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
Box 450
Madison, Wisconsin 53701

CO-214-G

1. COUNTY **Columbia** CHECK ONE Town Village City NAME **Pacific**

2. LOCATION - 1/4 Section **SW-Sec.** Section **27** Township **12N** Range **9E** 3. OWNER AT TIME OF DRILLING **Wisconsin Power & Light Co. Well #2**
OR - Grid or street no. Street name ADDRESS **P. O. Box 192 Well No. 2**

AND - If available subdivision name, lot & block no. POST OFFICE **Madison, Wis. 53701**

4. Distance in feet from well to nearest: BUILDING SANITARY SEWER FLOOR DRAIN FOUNDATION DRAIN WASTE WATER DRAIN
(Record answer in appropriate block) C. I. TILE C. I. TILE SEWER CONNECTED INDEPENDENT C. I. TILE

CLEAR WATER DRAIN SEPTIC TANK PRIVY SEEPAGE PIT ABSORPTION FIELD BARN SILO ABANDONED WELL SINK HOLE
C. I. TILE

OTHER POLLUTION SOURCES (Give description such as dump, quarry, drainage well, stream, pond, lake, etc.)
Site approved #3320

5. Well is intended to supply water for: **Industrial and Potable NORTH WELL P.W. #43224**

6. DRILLHOLE						9. FORMATIONS			
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	Kind	From (ft.)	To (ft.)	
#19	Surface	152.5				Glacial Drift	Surface	102	
15	152.5	252.5				Sandstone	102	252.5	

7. CASING, LINER, CURBING, AND SCREEN			
Dia. (in.)	Kind and Weight	From (ft.)	To (ft.)
20	Steel x 3/8"	Surface	110.5
	A-53-B		
16	Steel x 3/8"		152.5
	A-53-B		

8. GROUT OR OTHER SEALING MATERIAL			10. TYPE OF DRILLING MACHINE USED			
Kind	From (ft.)	To (ft.)	<input checked="" type="checkbox"/> Cable Tool	<input type="checkbox"/> Direct Rotary	<input type="checkbox"/> Reverse Rotary	
Neat Cement	Surface	152.5	<input type="checkbox"/> Rotary - air w/drilling mud	<input type="checkbox"/> Rotary - hammer with drilling mud & air	<input type="checkbox"/> Jetting with <input type="checkbox"/> Air <input type="checkbox"/> Water	

11. MISCELLANEOUS DATA
Yield test: **24** Hrs. at **1000** GPM
Well construction completed on **April 12** 1972
Well is terminated **24** inches above below final grade
Well disinfected upon completion Yes No
Well sealed watertight upon completion Yes No
Depth from surface to normal water level **34** ft.
Depth to water level when pumping **100** ft.
Water sample sent to **Will submit when pump is started.** laboratory on: **19**

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to nearby wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, sub-surface pumprooms, access pits, etc., should be given on reverse side.

SIGNATURE **EGERER-GALLOWAY WELL CORP.** COMPLETE MAIL ADDRESS **13640 W. Carmen Ave. Menomonee Falls, WI 53051**
Geo. M. Galloway/EP Registered Well Driller

Please do not write in space below
COLIFORM TEST RESULT GAS - 24 HRS. GAS - 48 HRS. CONFIRMED REMARKS

Property Owner **WISCONSIN POWER & LIGHT** Telephone Number - -
 Mailing Address PO BOX 98
 City PORTAGE State WI Zip Code 53901
 County of Well Location SC Co Well Permit No W Well Completion Date July 14, 1976

Depth **310** FT
1. Well Location
 T=Town C=City V=Village Fire#
C of PORTAGE
 Street Address or Road Name and Number
 Subdivision Name Lot# Block #

Well Constructor License # Facility ID (Public)
MILAEGER WELL & PUMP 82 111021460
 Address Public Well Plan Approval#
 20950 ENTERPRISE AV
 City State Zip Code Date Of Approval
BROOKFIELD WI 53005
 Hicap Permanent Well # Common Well # Specific Capacity
 43225 Well Completion Date July 14, 1976

Gov't Lot or **SW** 1/4 of **SW** 1/4 of
 Section **27** T **12** N R **9** E
2. Well Type **1** (See item 12 below)
 1=New 2=Replacement 3=Reconstruction
 of previous unique well # _____ constructed in _____
 Reason for replaced or reconstructed Well?
1 1=Drilled 2=Driven Point 3=Jetted 4=Other

3. Well Serves # of homes and or **GENERATING STATION** High Capacity:
N (eg: barn, restaurant, church, school, industry, etc.) Well? **N**
 M=Munic O=OTM N=NonCom P=Private Z=Other X=NonPot A=Anode L=Loop H=Drillhole Property? **N**

4. Is the well located upslope or sideslope and not downslope from any contamination sources, including those on neighboring properties? **N**
 Well located in floodplain? **N**
 Distance in feet from well to nearest: (including proposed)

1. Landfill	9. Downspout/ Yard Hydrant	17. Wastewater Sump
2. Building Overhang	10. Privy	18. Paved Animal Barn Pen
3. 1=Septic 2= Holding Tank	11. Foundation Drain to Clearwater	19. Animal Yard or Shelter
4. Sewage Absorption Unit	12. Foundation Drain to Sewer	20. Silo
5. Nonconforming Pit	13. Building Drain	21. Barn Gutter
6. Buried Home Heating Oil Tank	1=Cast Iron or Plastic 2=Other	22. Manure Pipe 1=Gravity 2=Pressure
7. Buried Petroleum Tank	14. Building Sewer 1=Gravity 2=Pressure	1=Cast iron or Plastic 2=Other
8. 1=Shoreline 2= Swimming Pool	15. Collector Sewer: ___ units ___ in . diam.	23. Other manure Storage
	16. Clearwater Sump	24. Ditch
		25. Other NR 812 Waste Source

5. Drillhole Dimensions and Construction Method

From (ft.)	To (ft.)	Upper Enlarged Drillhole	Lower Open Bedrock
20.0	surface	113	
19.0	113	153	
15.0	153	310	

-- 1. Rotary - Mud Circulation -----
 -- 2. Rotary - Air -----
 -- 3. Rotary - Air and Foam -----
 -- 4. Drill-Through Casing Hammer
 -- 5. Reverse Rotary
 X -- 6. Cable-tool Bit _ n. dia -----
 -- 7. Temp. Outer Casing _ in. dia. ____ depth ft.
 Removed ?
 Other

8. Geology

Geology Codes	Type, Caving/Noncaving, Color, Hardness, etc	From (ft.)	To (ft.)
__T__	GLACIAL DRIFT	0	113
__N__	SANDSTONE	113	310

6. Casing Liner Screen

Dia. (in.)	Material, Weight, Specification	From (ft.)	To (ft.)
20.0	STEEL .375 ASTM 53-B 78#/FT	surface	113
16.0	STEEL .375 ASTM 53-B 62#/FT	113	310

Dia. (in.)	Screen type, material & slot size	From	To

9. Static Water Level
 25.0 feet **B** ground surface
 A=Above B=Below

10. Pump Test
 Pumping level 50.0 ft. below surface
 Pumping at 250.0 GP 12.0 Hrs

11. Well Is: 18 in. A Grade
 A=Above B=Below
 Developed? **N**
 Disinfected? **Y**
 Capped? **Y**

7. Grout or Other Sealing Material

Method	Kind of Sealing Material	From (ft.)	To (ft.)	# Sacks Cement
	NEAT CEMENT	surface	153.0	

12. Did you notify the owner of the need to permanently abandon and fill all unused wells on this property? **N**
 If no, explain

13. Initials of Well Constructor or Supervisory Driller **R** Date Signed 7/14/76
 Initials of Drill Rig Operator (Mandatory unless same as above) Date Signed

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

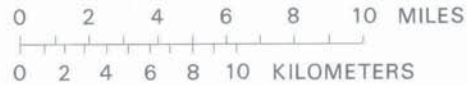
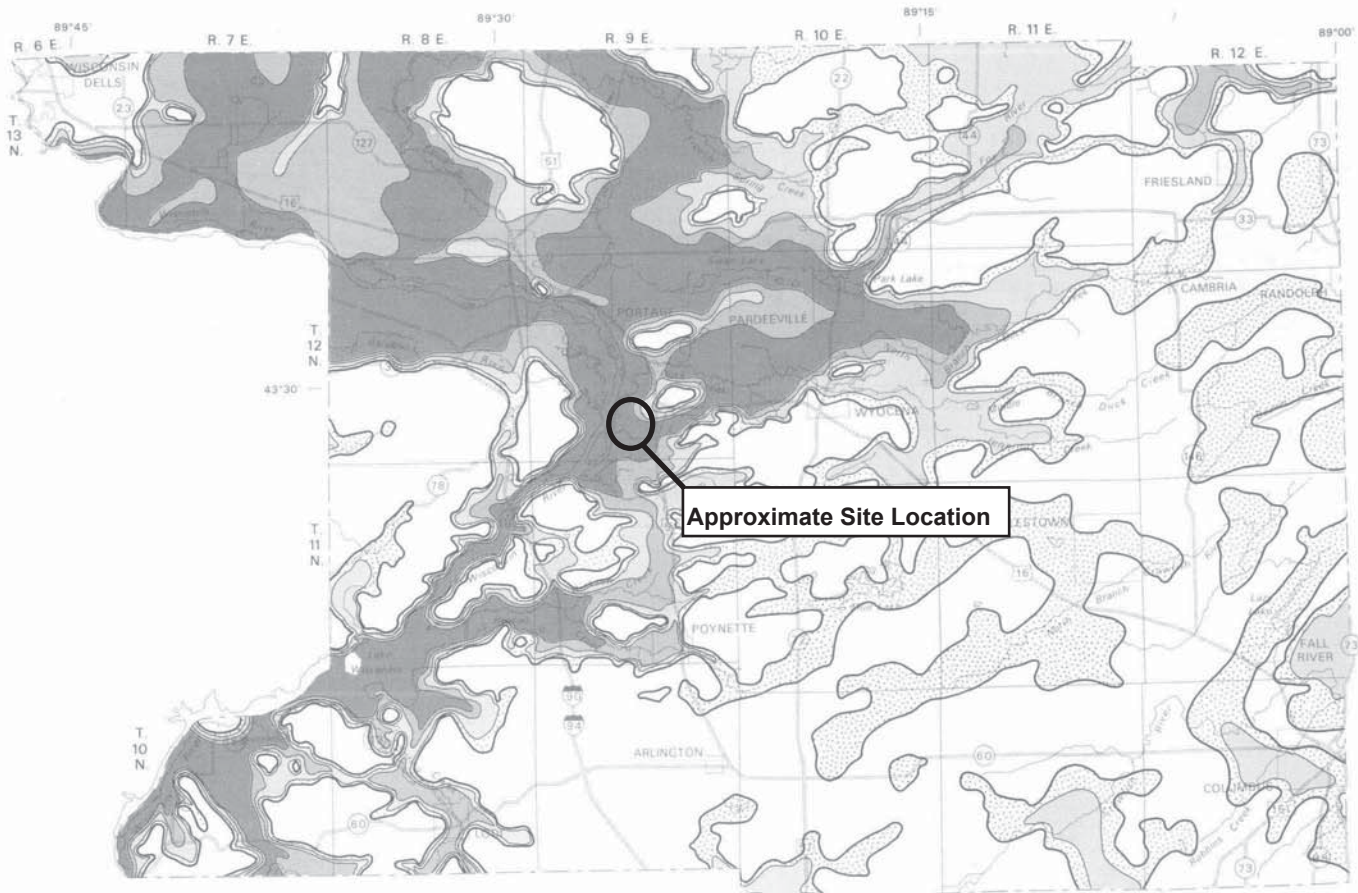
Approximate Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary (0-1 million years old)	Surficial Aquifer	0 to 300+	Holocene & Pleistocene Deposits	<ul style="list-style-type: none"> • Unconsolidated clay, silt, sand, gravel, cobbles, boulders, and organic 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.

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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.

Generalized water-table elevation in Columbia County, Wisconsin

